REPORT OF THE

AGRICULTURAL OPPORTUNITIES COMMISSION

TO

THE GOVERNOR

AND

THE GENERAL ASSEMBLY OF VIRGINIA

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EXECUTIVE SUMMARY AND MAJOR RECOMMENDATIONS

Agriculture, including its farm and off-farm sectors, is Virginia's largest single industry. This industry employs a work force of more than 450,000 persons and contributes a substantial part of Virginia's gross state product.

A strong and efficient agricultural and forestal industry has been and continues to be a key to Virginia's growth success and high standard of living. Virginia's industry of agriculture is both diverse and dynamic. Diversity comes from the different types of farms, different soil types, the wide variety of agricultural crops produced in Virginia, weather, and a farm labor force with varied age, education and managerial abilities. Dynamics are evidenced by changes in the types of farms, number of higher income farms, income distribution of farmers, and percentage of acres planted to acres of total cropland. The diversity and dynamics of production are compounded by many developments in marketing food and fiber.

The farms in Virginia are expected to have a gross farm income of $1.65 billion in 1979. Beyond the farm gate the industry of agriculture accounts for about 50 percent of the Commonwealth's manufacturing work force; about 12 percent of the Commonwealth's wholesale and retail work force, or about 20 percent of all non-farm jobs in the Commonwealth.

The importance of agriculture to the overall economy of the Commonwealth, the dependence of the population on agriculture for the basic food and fiber requirements, and the need to maintain a high level of vitality in the industry of agriculture make it a matter of public interest to seek out opportunities for improvements in the structure and profitability of the industry of agriculture and to make recommendations for public policy decisions that will achieve these opportunities. With this in mind, the Virginia Agricultural Opportunities Commission was established on July 1, 1978. The duties of the Commission are to advise the Governor and the General Assembly on the state of the Virginia industry of agriculture; to identify new and expanded production and marketing opportunities for Virginia farm products; and to recommend courses of action that will promote the development of the opportunities identified.

This report is developed to provide an up-to-date view of Virginia agriculture, its people, its strength, its problems, its opportunities, and to provide concrete recommendations for effectively dealing with them.

Farm Survey

In order to obtain information on opportunities and problems in Virginia agriculture, a random sample of Virginia farmers was selected to identify factors affecting profitability of different types of farming and forestry operations. Respondents were asked to identify problems in farming, factors affecting their farm profitability, projected changes in their farming operations, and ways to improve the economics of agriculture in Virginia.

When the responses to this survey were analyzed, most farmers appeared to view the failure of farm prices to keep up with the constant rise in cost of production as the major problem facing agriculture. In addition to economic factors, excessive government intervention, inadequate markets, and encroachment of urban development were viewed by some respondents as problems facing Virginia agriculture.

When asked to suggest ways to improve the profitability of farming, respondents indicated a need to improve agricultural markets, provide more agricultural research, reduce real estate taxes, reduce government intervention, and improve the agricultural labor situation. Many respondents expressed a need for higher commodity prices, lower input costs, or both.

In addition, the survey identified characteristics of Virginia's farms and farmers. Some of the major characteristics are:

- Average age of Virginia's farmers is 57.9 years.

- 85 percent of Virginia's farms are family farms.

– One-third of the average farm family income comes from off-farm sources.

– The majority of farmers are high school graduates or higher.

– 68 percent of Virginia's farms were profitable in 1978.

– Over the last 10 years, farming was profitable an average of 4.9 years.

It is very evident that ways to improve the economics of agriculture and forestry are numerous and varying in nature. This study, however, addresses methods suggested by Virginia farmers as well as other methods identified by members of this Commission and agricultural leaders throughout Virginia. However, before discussing major methods, with supporting recommendations, to improve the profitability of Virginia agriculture, agricultural and forestry trends and projections in Virginia are presented.

Trends and Projections in Virginia Agriculture

During the past decade, Virginia farmers expanded production, improved yields and adapted to changing conditions and technologies. Developments during this period included:

– Larger but fewer farms

– More purchased and less farm-produced inputs

– Higher yields for crops, livestock and poultry

– More machines but fewer workers

– Greater borrowings and less self financing

– Higher land prices and record high interest rates

– Large shifts in supply-demand balances and severe price instability

– Slowdown in growth of domestic demand while value of exports quadrupled.

Inflation was a distinct feature of the past decade and no end is in sight. Although the index of prices received by farmers in 1979 was 2.16 times that of 1970 for all farm commodities, the index of farm prices paid by farmers for production items in 1979 was 2.40 times the 1970 level. Higher yields, more efficient use of resources, and improved management enabled Virginia farmers to experience higher net farm incomes in the 1970's than in the 1960's even after taking inflation into account.

Yields of many crops produced in Virginia increased during the past decade but the rate of increase slowed. Virginia's share of United States production, an indicator of Virginia's relative agricultural growth, declined during the 1970-77 period for all major crops except tobacco. In the livestock sector, production of cattle and calves, hogs, sheep and lambs declined. Milk production increased at a modest 1.1 percent annually. Production of broilers, eggs and trukeys grew rapidly and Virginia's share of U. S. production for all three increased–reversing a declining trend during the 1955-70's. Agriculture in Virginia has been shifting towards livestock and poultry relative to crops and relative to other states.

Virginia is experiencing significant changes and problems concerning the balance of timber harvest and timber growth. Softwood timber harvest is exceeding new growth timber while new growth in hardwood is exceeding harvest.

Assuming a continuation of the trends of recent years, the number of farms in Virginia may be expected to decline about 20 percent in the next ten years but the value of sales can be expected to increase by about 30 percent based on constant dollars. More than 80 percent of farm production sales in 1990 is projected to come from the two largest farm sales classes comprising only 15 percent of farms. If present trends continue, by 1990 the 2,700 largest Virginia farms will be

producing as much as 76,000 farms produced in 1970.

Cash receipts are projected to increase but production expenses are projected to rise faster and cause a drop in net farm income. The upward trend in real estate assets and debts is expected to continue.

Commodity projections indicate the poultry and livestock sectors will increase faster than the crop sector, thus continuing the trend of Virginia agriculture to poultry and livestock. Commodity projections have implications for the various farming regions in the Commonwealth. Three regions in particular, Shenandoah Valley, Southeast and South Central, are faced with very different prospects. The major commodities produced in the Shenandoah Valley region appear likely to expand and the outlook in this region is favorable. On the other hand, the major cash commodities produced in the Southeast and South Central regions are projected to increase slowly or decline. The South Central region also contains considerable idle farm land. Grain, livestock, or forestry could expand in this area and utilize the current under-utilized land resources.

Opportunities as reflected in recommendations in this report, if developed, could cause significant changes in these trends to benefit Virginia's agriculture. In this report, recommendations are listed without inference of priority.

Areas Affecting Profitability and Major Recommendations

Availability and effective management of resources are crucial to the future profitability of Virginia's industry of agriculture. Major resources addressed are: land, water, timber, energy, facilities and equipment, labor, management, and capital.

To increase the effective management of agricultural and forestry resources, it is recommended with regard to:

A. Land, Water and Timber.

1. That the 1980 General Assembly give strong support to the continued development of the proposed Virginia Resource Information System. This project, if effectively funded and developed, will provide up-to-date, timely and accurate information for decisions by the General Assembly, Executive Branch Agencies, local governments and the private sector on: issues affecting soil, water, atmosphere, and other natural resources in Virginia; man-made installations which impact on resources; and socio-economic factors relating to resources.

2. That the Virginia Cooperative Extension Service cooperate with the Department of Housing and Community Development, Soil and Water Conservation Commission, Department of Conservation and Economic Development, and Department of Agriculture and Consumer Services in developing and implementing a continuing comprehensive statewide educational project on issues affecting the farm and forest resources in Virginia.

3. That biennial budgets of the Commonwealth of Virginia allocate sufficient funds to the cooperative soil survey and mapping project for completion of this according to the master plan by 1995.

4. That state agencies, planning districts and local governments make routine use of soil capability information in decisions affecting land use.

5. That pilot work by the U. S. Department of Agriculture Soil Conservation Service be accelerated to complete preparation and publication of prime agriculture and forest land maps as soils surveys are completed in each county.

6. That all state agencies with responsibilities relating to land management, land grant universities, and local governments take steps to achieve the objectives of the Clean Water Act through voluntary means relating to non-point source pollution control and to reduce soil losses from erosion and sedimentation in Virginia to levels recommended by the U. S. Department of Agriculture Soil Conservation Service.

B. Energy.

1. That steps be taken by the Department of Agriculture and Consumer Services, Office of Emergency and Energy Services, and the Governor to give a top priority for necessary energy resources in food and fiber production, marketing, processing and distribution.

2. That research and demonstration projects be developed in cooperation with Virginia Land Grant Universities and other agencies and organizations on alternative non-fossil fuels that can be economically developed for agricultural production and/or marketing purposes.

3. That the Department of Agriculture and Consumer Services maintain a high priority on its designated responsibilities for developing a program for the production and marketing of industrial alcohol in Virginia for fuels in such products as "gasohol."

4. That the General Assembly amend the Code of Virginia to release landowners from liability resulting from injury by individuals who purchase firewood or who remove firewood free of charge for home heating purposes.

C. Facilities and Equipment.

1. That Virginia's Land Grant Universities conduct information and educational projects for more effective decisions on the acquisition, use and maintenance of facilities and equipment for improving current and long-term profitability in agricultural enterprises.

2. That the Land Grant Universities make effective use of information provided by the Virginia Water Use Data System, now under development, as an adjunct to the research and demonstration projects affecting irrigation in order to reduce costs and increase profitability particularly in seasons when droughts occur.

3. That Virginia Polytechnic Institute and State University increase research and education concerning grain storage and drying systems with emphasis on reductions of crop drying costs through the use of solar drying systems.

D. Labor and Management.

1. That continued efforts be made by state and federal agencies to: coordinate regulatory inspection services; reduce duplications of effort; prevent unnecessary interference; improve services relating to seasonal and migrant agricultural labor; and to improve the practicality of occupational safety and health regulations. Such efforts should recognize the needs for competent and reliabie workers thorughout the industry of agriculture at all times.

2. That efforts be made by the entire industry of agriculture to place key emphasis on business management and business decision making in planning and programming its work for the 1980s.

E. Capital.

1. That lending institutions, mechandisers of farm supplies and equipment and the Governor's Agricultural Credit Committee give increased attention to long range financial and credit needs of the entire industry of agriculture.

2. That the Governor's Agricultural Credit Committee further consider needs and benefits of an agricultural credit authority quite similar to Virginia's housing authority and educational loan authority to generate additional capital specifically for agricultural production enterprises.

3. That the Governor's Agricultural Credit Committee's Agricultural Credit Handbook be further developed in order to serve effectively as a business management tool for farmers, farm suppliers and lending institutions.

4. That Virginia Polytechnic Institute and State University further emphasize services in farm management with particular attention to the management and use of financial resources.

Markets and Marketing

Virginia farms and forest lands are strategically located on the doorstep of the largest single segment of U. S. consumers and adjacent to a major port through which large quantities of agricultural products move to foreign lands. Opportunities exist for improving the profitability of agriculture and forestry in Virginia by the development or improvement of new marketing techniques or services which will provide an incentive for increased farm production, increase the convenience of entry into the marketing systems by producers, improve the efficiency of the marketing system, and deliver the products to the consumer in the desired manner at competitive prices.

To assist producers of agricultural and forestry products in Virginia to achieve the potentials offered by opportunities in markets and marketing, it is recommended that:

A. The Virginia Department of Agriculture and Consumer Services, Virginia Polytechnic Institute and State University and Virginia State University:

1. Develop and disseminate production and marketing information that will enable producers to expand cattle feeding programs to provide animals for processing facilities being developed in Virginia and, thus, reduce the movement of calves to more distant feedlots.

2. Develop and disseminate production and marketing information that will enable producers to expand swine production to supply a greater proportion of local processing needs.

3. Improve the efficiency, reduce the costs, and increase the convenience of livestock marketing systems through the use of electronic marketing techniques and producer marketing associations.

4. Determine the feasibility of a slaughter facility for sheep and lambs in or nearby Virginia. In this study, the feasibility of expanding the cattle slaughter facility at Jarrett, Virginia should be considered.

5. Improve the marketing system for feed grains in Virginia as an incentive for increased grain production on unused or underutilized acerage in Virginia by providing information on feed grain drying and storage facilities, forward pricing techniques, and producer marketing associations. This would reduce the dependence of the poultry industry on imported grain and enable small producers to obtain the marketing advantages normally associated with high volume producers.

6. Develop alternatives within the present tobacco and peanut programs that would enable the producers of these crops to be more competitive in world markets and, thus, increase the demand for these products and the profitability of their farms.

7. Develop marketing programs for the horse industry, such as a horse center, which, with sufficient private and public support, would enable this industry to increase its contribution to the economy of the Commonwealth.

8. Increase their efforts to provide technical information to meet the special needs of producers who are interested in and can take advantage of opportunities of direct marketing.

B. The Virginia Department of Agriculture and Consumer Services:

1. Provide more accurate, timely, and readily available market information and analysis by increasing the number of marketing points served by trained reporters and increasing the speed at which this information is collected and disseminated to enable Virginia producers to improve their marketing strategy.

2. Expand the capabilities of commodity promotion activities to include all areas of the state, develop and implement a Virginia retail food production program, and provide for the promotion of Virginia food products in foreign lands.

3. Expand its capability of providing quality grading for producers of agricultural commodities

on a local basis and support this expansion by a program of training and supervision that would insure approved grade standards being accurately applied by certified graders.

C. The Senate Agriculture, Conservation and Natural Resources Committee and the Agricultural Committee of the House of Delegates appoint a joint subcommittee to study agricultural marketing practices.

D. The Virginia Department of Agriculture and Consumer Services and the Virginia Division of Forestry develop a marketing system that would provide for the assembly and distribution of small and low grade hardwood for energy uses in industrial and home heating. This would help to increase current income from forest lands and encourage the development of more desirable timber stands.

E. The Board of Agriculture and Consumer Services consider appointment of a broad-based task force of livestock producers, marketers, processors, and government officials to identify the opportunities for increased export sales of livestock meat and livestock products from Virginia and to make recommendations to achieve these opportunities.

F. The Virginia Ports Study Commission consider the following recommendations relating to the Virginia ports:

1. Improvements be made in facilities to handle tobacco by containers at Hampton Roads to improve the competitive position of Virginia ports compared to those in the south.

2. High priority be given to improving highway #58 by providing bypasses for Franklin, Courtland, Emporia and South Hill, and by completing the dual highway through Mecklenburg and Southampton Counties to provide better access to the port of Hampton Roads.

3. "No charge" storage time be increased at Virginia ports.

4. The Virginia Ports Authority assume an active role for the state in negotiations with the International Longshoremen's Association on work rules affecting bulk and container shipments of agricultural and forestry products.

5. Negotiations be made to reduce restrictions on transfer between rail lines serving Virginia ports and to improve storage and handling facilities for rail systems.

6. Lash-barge services be encouraged.

Transportation

Transportation is a vital part of the agricultural and forestry production and marketing system. Virginia's location near a large segment of the domestic market and with fine export facilities within her borders, suggest an opportunity for Virginia producers to find more favorable markets as transportation from more distant production areas becomes more difficult and more expensive. It, therefore, appears reasonable to suggest that strong efforts be made to maintain an effective transportation system within Virginia to take advantage of the opportunities and it is recommended:

A. That the General Assembly:

Amend current laws to make permanent the temporary 80,000-pound gross weight and 60-foot length limits for tractors and trailers to make these limits more uniform between states and reduce fuel costs per ton of agricultural commodities transported.

B. That the General Assembly consider:

1. Providing an axle weight exemption for producers moving agricultural products from the farm to handling or processing facilities during harvest time since field weighing devices are impractical. This exemption might be limited to 25 miles or less.

2. Creating a transportation equipment authority through which commodity groups needing special equipment such as hopper cars and livestock trailers would be able to obtain low interest loans to purchase this equipment.

3. The feasibility of establishing a separate state agency for all rail planning and operations, now a part of the Virginia Department of Highways and Transportation. Rail transportation needs and concerns of Virginia agriculture and forestry should receive high priority in all state rail planning efforts.

4. Creating an industrial access rail fund, similar to the industrial access road fund, to provide rail access to agricultural facilities such as grain elevators, storage facilities, processing plants and similar installations.

C. That the General Assembly and all Virginia agriculture reafirm their support for the continuation of the Eastern Shore Rail Line, the loss of which, when Federal subsidies cease on April 1, 1981, will cause serious transportation problems in this area.

D. That Federal laws and regulations be amended to ban seasonal or peak demand rates for agricultural products; to continue use of multiple car rates; and insure continuation of an adequate transportation system for Virginia's agricultural and forestry industry.

E. That the Virginia Department of Highways and Transportation evaluate all rural roads and bridges in Virginia to determine those in need of rehabilitation or improvement to maintain satisfactory access to market from Virginia's farms.

F. That the Commissioner of Agriculture and Consumer Services appoint an Agricultural Transportation Advisory Committee, made up of representatives of Virginia's industry of agriculture having the greatest utilization of transportation. This Committee will recommend actions to solve transportation problems in Virginia's agriculture.

G. That the Virginia Department of Agriculture and Consumer Services continue efforts to increase the use of:

1. Virginia's inland waterways for the transportation of agricultural commodities, including an increase in livestock, container, break bulk and bulk shipments.

2. Air shipments of agricultural products.

Improved Technology in Agricultural Research

Increases in efficiency of agricultural production brought about by new knowledge and technology are responsible for about 80 percent of the production increases in recent years. By improving their efficiency, Virginia farmers during 1970-78 have been able to expand production by 23 percent while using 13 percent less land and 25 percent less labor. The future success of Virginia agriculture depends to a great extent upon maintaining a strong agricultural research base and scientific capacity to add to that base. At present, the reserves of technology are dwindling and new knowledge is being consumed faster than it is being produced.

Agricultural research benefits the public and the industry of agriculture in many ways. It is in the public interest of the Commonwealth, therefore, to improve the profitability of Virginia agriculture and forestry through the application of new technologies derived from research. It is recommended that:

A. The Governor and the General Assembly establish a clearly defined policy of high priority for the support of agricultural research.

B. Virginia Polytechnic Institute and State University restore the identity and visibility, re-emphasize the importance of, and improve the accountability, operating efficiency and budget authority of the Virginia Agricultural Experiment Station.

C. Virginia Polytechnic Institute and State University assign the Virginia Agricultural Experiment

Station the full responsiblity for administration of all state agricultural research funds appropriated to Virginia Polytechnic Institute and State University as it now has for all federal formula funds for agricultural research.

D. A broadly representative agricultural research advisory council be established by the Virginia Agricultural Experiment Station to provide advice on the funding and priorities of agricultural research.

E. An annual report of the Virginia Agricultural Experiment Station be submitted to the Governor, President of the University, members of the General Assembly, and to the industry of agriculture.

F. Priority areas for agricultural research funding be established as follows and specific needs in each area be investigated:

- basic
- energy
- production efficiency
- natural and renewable resources
- food processing, marketing and distribution
- food safety and quality, human nutrition and health
- agricultural export opportunities.

Small and Part-Time Farmers

The number of small farms in Virginia has been declining for the past twenty years. Although the proportion of agricultural output from these farms is expected to continue to decline, such farms provide an opportunity for operators to supply many specialized agricultural products and participate fully in the rural life of our state. To assist these farms in making a meaningful contribution to society, programs to serve their needs must be tailored to their specific resource situation, alternatives open to them, and personal goals. To provide this assistance, it is recommended:

A. That Virginia's Land Grant Universities give particular attention to research and education activities which are especially adaptable to Virginia's nearly 50,000 small and medium sized farm operations.

B. That Virginia's Land Grant Universities and the Virginia Department of Agriculture and Consumer Services:

1. Determine the feasibility of establishing model small farm research and demonstration units where economic enterprises and technology appropriate to production and marketing on small farms can be developed, tested and demonstrated.

2. Utilize agencies such as the Community Service Administration, Community Action Agencies and others to develop mechanisms for expanding assistance to small farms and small farm groups.

C. That appropriate State and Federal agricultural agencies in rural communities improve their accessibility by opening offices during hours convenient to farmers employed in full-time off-farm jobs.

New Enterprises

Virginia's broad base of soils, water resources, transportation systems, and nearby consumer

demands are paralleled by a wide variety of agricultural production, marketing, processing and distribution enterprises. Considerable interest has developed in recent years in the development of new enterprises in grape and wine production, aquaculture, and use of wood for energy.

Grape and Wine Production.

Table grapes and wine grapes are produced in Virginia and there are successful production operations in each class of grapes. Success by these producers, opinions of experts in the field, and nearby market outlets are strong indicators that grape production and wine making are feasible in Virginia.

To assist in the development of this new enterprise in Virginia, it is recommended:

A. That Virginia Polytechnic Institute and State University develop a well coordinated research program relating to grape and wine production in Virginia.

B. That the General Assembly amend the Code of Virginia to establish a new farm winery law relating to the licensing of farm wineries and tax on table wine made in farm wineries and sold in Virginia.

Cage Culture of Channel Catfish.

The production of channel catfish in agricultural waters represents a new and rapidly growing farm industry. This is an exciting concept with the potentials of becoming one of the major food-producing industries.

To provide the information on which this new enterprise may be properly appraised under conditions in Virginia, it is recommended:

That the Virginia Polytechnic Institute and State University establish a small-scale demonstration research catfish culture unit that can be scientifically monitored to assess the potential of catfish farming in Virginia.

Fresh Water Commercial Aquaculture in Virginia.

The development of the fresh water commercial aquaculture industry in Virginia is strongly impacted by the regulatory permit process. Procedures to obtain the necessary permits and licenses are confusing, expensive, time consuming, inflexible, and redundant. This represents a substantial deterrent to aquaculture development.

To assist in the development of the fresh water aquaculture industry in Virginia, it is recommended:

A. That a register of permits and environmental requirements relating to fresh water commercial aquaculture in Virginia be compiled and published citing the legal authority, determining agency, applicability, purpose, data required, costs, sources of professional assistance and other relevant information.

B. That these laws and regulations be reviewed to identify changes which would assist the development of fresh water commercial aquaculture in Virginia.

Use of Wood for Energy.

Increased costs of petroleum-based fuels have caused increased interest in using wood and other fibrous materials for heat energy. A new enterprise, if properly managed, can make wood products available to supply a portion of energy needs and provide an incentive for forest management and a market for forest land production. It is recommended that:

Wood for energy projects be further developed at the Virginia Polytechnic Institute and State University, School of Forestry and Wildlife Resources.

Preservation of Agricultural and Forestry Land in Virginia

The competition for agricultral land between agricultural and non-agricultural uses has become intense in many parts of Virginia. There is a growing recognition throughout the nation and Virginia of the need for policies and programs to assure that productive agricultural and forestry land will be available for future generations. The best time to develop programs that will minimize the shifting of productive agricultural land to non-agricultural use is before this problem becomes more acute. Effective planning must be at the front end of development, industrial siting, large lot zoning, placement of utilities, leap frog development, and the premature idling of land.

In order to improve efforts and services for the preservation of agricultural and forestry land, it is recommended:

A. That the General Assembly consider an amendment to the Code of Virginia to:

1. Allow continued operation of established agricultural and forestal enterprises unless such enterprises present safety or health hazards.

2. Change Section 15.1-447, Paragraph 1 (A) to include "Production of food and fiber" as a specific factor to be considered in the preparation of local comprehensive plans.

3. Change Section 15.1-489, by adding subsection (8) to read: "To provide for the preservation of agricultural and forestal lands."

B. That the Governor and General Assembly give clear direction to the appropriate agency or agencies to complete an inventory of productive agricultural and forestry land; to document the reasons for land resource shifts; and to project the future relationship of Virginia's agricultural products versus consumer needs in light of the developing energy situation.

C. That Virginia Polytechnic Institute and State University develop a method by which localities can assess the direct and indirect value of the agricultural industry to the local economy.

D. That the Virginia Department of Agriculture and Consumer Services continue to monitor the state's Land Use Assessment Law and the Agricultural and Forestal Districts Act to determine the effectiveness of these laws and the need for further refinements.

E. That programs based on the concepts of purchasig or leasing development rights as part of the package of property rights be evaluated. The State of Maryland has pioneered some of these programs and specific ones for study include the Development Rights Program (Howard County), Transfer of Development Rights (Calvert County), and the Leasing of Development Rights. Some localities are seriously considering these approaches, but fear they do not have the necessary enabling legislation. It is recommended that a local option "pilot program" incorporating one or all of these concepts be established and evaluated for effectiveness prior to any statewide program. Other alternative tools such as the circuit breaker income tax program which is successful in Michigan and Wisconsin, permanent easement benefits, and changes in property taxation should be further evaluated for their applicability in Virginia.

F. That the state provide added financial and/or technical assistance in rural planning and assist local governments in obtaining federal funds for farmland and preservation procedures.

Laws and Regulations

In our society, there is a general acceptance of laws, regulations, and programs to deal with conflicts, provide relief, preserve values, provide incentives, and to protect the public. The primary concern is that laws, regulations, and programs be properly assessed for all possible consequences to justify limitations placed on uses and the people depending on that use and the common good of all people. Laws and regulations which have appeared to have the most significant effects on the profitability of agriculture and forestry in Virginia were considered. These areas of concern are: resource management, waste management, pollution control, management of pesticieds, drugs and hazardous materials, pest controls, labor, and others.

With regard to proper use of laws and regulations affecting agriculture and forestry, it is recommended:

A. That agencies charged with the implementation of programs developed in response to the several resource management acts increase their efforts to reach the objectives of these programs.

B. That the General Assembly and the Congress increase funding for:

1. Technical support of these programs.

2. Financial incentives where the benefits accrue to society at large and that these incentives be made uniform between programs with the same objectives.

C. That continued support be given the voluntary use of the Best Management Practices program for the control of non-point source pollution.

D. That proposed changes in water legislation be evaluated in terms of their potential impact on farm irrigation.

E. That laws prohibiting the disposition of sewerage sludge or effluent on agricultural land without an approved disposal plan, including analysis of the content, be implemented at the earliest possible moment.

F. That in the administration of the Clean Air Act and the Clean Water Act, the objectives of these statutes be accomplished with the least possible restrictions on agricultural and forestry production.

G. That a separate section applicable to animal waste be established under the Clean Water Act rather than treating animal waste under the "other waste" category.

H. That a uniform benefit/risk assessment policy be developed in relation to the use of additives, drugs and pesticieds. In this connection, the "Dulaney Amendment" should be amended to permit reasonable tolerances when scientific evidence indicates such tolerances would not be harmful to human health.

I. That the Food and Drug Administration move with greater speed in adopting or establishing guidelines and tolerances for foods and all alternatives be considered before removing food items from the market.

J. That an effective means be developed to prevent the misuse of chemicals in agricultural production.

K. That the General Assembly amend Plant Pest Laws to assure adequate protection for our agricultural and forest industries.

L. That Virginia Polytechnic Institute and State University devise eductional programs to assure that farmers and foresters have a working knowledge of agricultural labor laws and regulations.

M. That equal protection be provided for agricultural employers in regulations relating to agricultural and forestry labor laws.

N. That regulations relating to labor laws recognize the working conditions on farms and in the forest and endeavor to provide for the safety and health needs of the worker without impeding his productivity.

O. That subcommittees from the Courts of Justice Committees on the Senate and House study statutes providing compensation to the owner of livestock or poultry killed or impaired by dogs and make recommendations for legislative changes that would overcome the deficiencies of the statutes.

P. That subcommittees of the Courts of Justice Committees of the Senate and House study fencing laws to determine where they should be amended so that they can be administered more

uniformly.

The Unique Role and Impact of Virginia's Land Grant Universities

The agricultural programs of Virginia's land grant universities (Virginia Polytechnic Institute and State University and Virginia State University) are unique among all institutions of higher education in Virginia because they are the only ones providing comprehensive programs of teaching, research, and extension in agriculture and forestry. There are, therefore, no alternative institutions within the state to satisfy the eductional needs of agriculture. The success of these programs impacts on all citizens of the Commonwealth.

In order that the contributions of these institutions to our state and nation may be made even more significant, it is recommended that:

The Governor and the General Assembly request Virginia Polytechnic Institute and State University in cooperation with Virginia State University and others to formulate and submit to the State Council on Higher Education in Virginia a comprehensive higher educational plan to meet the many and broad educational needs of the industry of agriculture and the closely related businesses and services in the Commonwealth. This plan should address:

-The total needs of higher education for agriculture in Virginia. It should specify ways to intensify and improve the quality and relevance of higher education in Virginia without costly and unnecessary proliferation and duplication of programs. The Land Grant Universities shall seek appropriate input from the industry of agriculture and appropriate organizations and agencies, both State and Federal, in the formulation of this plan.

-The full range of educational programs in agriculture and forestry, including sub-baccalaureate, baccalaureate, masters, and Ph.D. degrees. Specifically, the plan shall consider a two-year agricultural program similar to successful programs at other Land-Grant Universities such as North Carolina State, Michigan State and Ohio State. Additionally, the plan should consider offering a Master of Agriculture Degree to be offered off-campus.

INTRODUCTION TO STUDY

Agriculture, including its farm and off-farm sectors, is Virginia's largest single industry. This industry employs a work force of more than 450,000 persons.

Off-farm agriculture supports Virginia's 59,000 farmers by providing production inputs and by processing, packaging and distributing farm outputs. Virginia's farm sector is an important key in the financial health of the entire agriculture/agribusiness complex. When one portion of the on-farm sector experiences problems, a ripple effect is felt throughout the industry by farmers, suppliers, processors, distributors and ultimate consumers.

Although American agriculture is recognized throughout the world for its strength, it is important to realize that this industry exists in a dynamic environment which operates under differing conditions and which must respond to changing needs. This report is developed to provide an up-to-date view of Virginia agriculture, its people, its strengths, its problems, its opportunities, and to provide concrete recommendations for effectively dealing with them.

The basic role of Virginia's industry of agriculture and forestry is production and marketing of food and fiber and this industry continues to be classified as both diverse and dynamic. Diversity comes from different types of farms, different soil types, weather and a farm labor force with varied age, education and managerial abilities. Dynamics are evidenced by changes in the type of farms, number of higher income farms, income distribution of farmers, and percentage of acres planted to acres of total cropland. The diversity and dynamics of production are compounded by many developments in marketing of food and fiber.

A strong and efficient agricultural and forestal industry has been and continues to be a key to Virginia's growth success and high standard of living. In the aggregate, Virginia's industry of agriculture employs more than 80,000 workers on the farm; more than 200,000 in agricultural and forestry-related manufacturing; and more than 185,000 in agricultural and forestry-related wholesale and retail businesses. This means that Virginia's industry of agriculture accounts for about 50 percent of the Commonwealth's manufacturing work force; about 12 percent of the Commonwealth's wholesale and retail work force or about 20 percent of all non-farm jobs in the Commonwealth.

The 59,000 farms in Virginia are expected to have a gross farm income of $1.65 billion in 1979. This farm income alone generates about $4.6 billion in economic activity when the ripple effects of these expenditures are taken into account. A dollar spent by a farmer will create about $2.80 in total income to the State's economy.

In 1978, about 55 percent of Virginia's total farm cash receipts came from marketings of livestock and livestock products and 45 percent came from marketings of crops. The dairy industry was the leading contributor of cash receipts and contributed 19.2 percent of the total cash receipts and 34.5 percent of the livestock and livestock products group. In the livestock and livestock products group, the dairy industry was followed by the poultry industry, cattle and calves and pork. Tobacco was the leading contributor of cash receipts in the crops group, contributing 16.2 percent of the total cash receipts and 36.6 percent of the cash receipts in this group. In the crops group, tobacco was followed by peanuts, soybeans, vegetables, feed crops and fruits.

Dairy farms made up 18 percent of all farms in Virginia in 1978 and the milk cow population was 173,000. In 1978, cash receipts from the marketings of milk and cream amounted to $208.3 million with sales of cull cows and calves adding $19.1 million for a total cash farm income of $227.4 million. When economic benefit multipliers are applied to the farm income generated by the dairy industry, its contribution to Virginia's economy reached about three-quarters of a billion dollars in 1978.

Tobacco is produced on about 40 percent of Virginia's farms and in 1978 was harvested from more than 70,000 acres. Cash receipts from marketing this crop amounted to more than $175 million. In addition to tobacco production, tobacco processing, tobacco products manufacturing, and exporting firms have extensive facilities in Virginia which bolster the economy. The Virginia Department of Labor and Industry estimates the value added by manufacturers of tobacco products in Virginia in 1976 was more than $1.2 billion. Gross returns from distribution and retailing tobacco products were more than $70 million annually and almost $14 million of revenue was generated by tobacco at Virginia ports. It is estimated that the total direct benefit of tobacco production,

warehousing, processing, product manufacturing, exporting, and distribution in Virginia amounts to about $1.5 billion annually.

It is estimated that farms in Virginia produce enough food to supply about 50 percent of the total need for food for over 5 million Virginians and are a net exporter of many agricultural commodities. This means that our agricultural production fulfills many of the increasing needs of Virginians and provides a supply of farm commodities to others. Based on projected population figures for the year 2000, Virginia will need an additional 1 to 1.5 million acres of cropland just to maintain this 50 percent supply of food relationship.[1]

The structure of Virginia agriculture continues to change. Improved farm production techniques have enabled producers to expand their operations and the number of farms has declined. Agriculture continues to be more capital and energy intensive. Machines continue to displace farm workers, and improved farm management techniques and expertise have led to improved agricultural production efficiencies whereby fewer farm inputs can produce a given amount of farm output or commodities. The application of herbicides and pesticides has produced higher yielding plants and animals. Many of these technological improvements can be expected in the future if adequate financial support can be provided for improved technology.

On the other hand, some emerging factors are cost-increasing in nature and result in no gains in farm productivities. An example in this area is the increasing number and types of government regulations that affect agriculture. Excessive environmental and safety constraints and the possible elimination of certain herbicides, pesticides, and growth hormones will definitely lower farm production efficiencies.

Inflation, increasing costs of farm production items, high cost of energy, rising land prices, higher taxes, increasing marketing costs, inadequate demand for farm production at profitable prices, the continuing shift of prime farmland to nonagricultural uses, and the uncertainty and changing nature of world markets increased the difficulty of individual farm operators to operate profitably. Other factors affecting profitability are: weather, inadequate amounts of farm resources which result in low production volumes, inefficient methods of production and poor management.

With this in mind, the Virginia Agricultural Opportunities Commission was established on July 1, 1978. The duties of the Commission are: to advise the Governor and General Assembly on the state of the Virginia industry of agriculture; to identify new and expanded production and marketing opportunities for Virginia farm products; and to recommend courses of action that will promote the development of the opportunities identified. In accomplishing these duties, the Commission's general philosophy was that with adequate rates of financial returns to farmers, there appears to be no evidence that indicates a lack of incentive for young persons to enter farming, or for most of our present farmers to remain in farming. Therefore, low returns to farm resources is believed to be the major farm problem in Virginia.

Information on opportunities and problems was obtained from farmers throughout Virginia. A detailed farm survey was mailed to 1600 farmers in November, 1978. This approach enabled our farmers' voice to be heard. The Commission believed that, in the past, many programs and policies affecting agriculture have been made by persons who were too far removed from the actual farm sector.

The survey form was designed to identify factors affecting profitability of different types of farming and forestry operations. Information was obtained on size and type of farm; sources and amounts of income, both farm and non-farm; and age and educational level of operator. Respondents were asked to identify problems of farming; factors affecting their farm's profitability; projected changes in their farming operations; and ways to improve the economics of agriculture in Virginia.

The major problems expressed by Virginia farmers are shown in Table 1. The most pressing problem of all types of farms was "farm input costs are too high." This response, when analyzed along with other problem areas such as inflation, low selling price of farm commodities, and the cost/price squeeze, points to the same core problem—a low net income situation in relation to production, management and investment costs.

Since most farmers appeared to view the major problem as one of input costs being too high, this indicates that farmers realize output prices are not keeping up with inflationary trends and that

the most visible aspect of the cost/price squeeze is the constant rise in input prices or costs of production.

The second overall leading response was the "other" category. This category consisted of a "hodgepodge" of various answers, each of which comprised a relatively small percentage when compared to the total. Included were such responses as too much easy credit, over-investment, too many gentlemen and part-time farmers, foreign purchase of farmland, and livestock diseases.

The third overall leading response was inflation. The impact of inflation on agriculture is very complicated. It has a significant effect on all farms, although the effects may differ. Small farmers, generally, produce a higher proportion of their farm inputs and their cash expenses and purchased farm inputs are lower per unit of output. On the other hand, through economies of scale, large farms may be able to reduce the adverse effects of inflation on production costs. Inflation does increase the value of farmland and, thus, the net worth of farmers. In recent years, the value of farmland has increased at a higher rate than inflation in general.

Excessive government intervention was reported to be a problem by many farmers. This area includes the involvement of government in management of commodity supply programs, establishment of price supports and target prices, export policies and programs, labor laws, and environmental and safety laws and regulations.

Other problems listed in Table 1 are the high cost of farmland; weather; inadequate markets; and the encroachment of urban development.

The rank of farm problems on a priority basis is given in Table 2. This information is useful in quickly identifying the relative importance of each major problem by type of farm. For example, it can be seen that peanut farmers ranked government intervention as their second leading response where it was fifth overall.

Encroachment of urban development, which ranked tenth overall, received a relatively high response from dairy farmers. However, the encroachment of urban development is a problem specific to the location of the farm rather than the type of farming enterprise.

Each major farm problem listed in Table 1 was compared to demographic variables such as age, income and education of farm operator, size of farm, and intentions of operator to change size of operation. Inspection of the comparisons yielded the following observations:

- Age of farm operator: The operator's age did not appear to affect the type of problem identified by farmers. There seems to be no problems identified that were peculiar to a certain age category of farmers.

- Educational level of farm operators: The identified farm problems did not have any particular educational level of farm operator common to them.

- Size of farm: An apparent trend was found in this area. Smaller farms tended to be more concerned with general economic conditions. Larger farms tended to be concerned with such problem areas as excessive governmental intervention, high cost of land, and inadequate markets.

- Total income: Lower income farms tended to identify economic issues as their major problem whereas higher income farms tended to identify government intervention, land costs, and inadequate markets. This finding appears to be consistent with the size of farm characteristic, indicating that in many cases there may be a relationship between farm size and farm income.

- Farmers' desire to change size of farming operations: No particular problem appears to influence farmers' intention to change the size of their operations.

Inadequate financial returns to farm resources were evident in answers provided by farmers to the question, "List the number of years your farming operation was profitable from 1968 to 1978." These results are shown in Table 3.

All farmers in the survey reported a profit in an average of 4.9 years from 1968 to 1978. It is

very difficult to find straightforward conclusions from these data since the definition of "profit" was left to each farmer's evaluation. However, each farmer knows at the end of a production year whether his cash receipts exceed, equal, or are less than cash costs of production.

Generally, the type of farms making profit in years above the average of 4.9 years were those participating in government sponsored production adjustment programs, that is, price supports along with some supply controls. An exception to this was found in the production of poultry and eggs. However, this is a highly integrated industry and this integration provides a degree of supply stability in relation to a product demand. Those below the average were basically found to be operating under conditons of a "free market." A free market exists where a commodity selling price is established by supply and demand without any supply restrictions on acres planted or quantities sold in the marketplace.

The average of 4.9 out of ten years is not a very optimistic statistic and gives support to the belief that farm incomes must be improved.

In addition to farm income, many farmers receive income from nonfarm sources. The percent of total income that comes from farm sources is shown in Table 4. Based on the survey, about two-thirds of total income comes from the farm, that is, the sale of crops, livestock, and livestock products. The type of farms receiving more farm related income were found to be poultry and egg, tobacco, dairy, peanut, and swine farmers. General observations from Table 4 are:

- Some fairly large differences of income obtained from farm and nonfarm sources exist within Virginia agriculture.

- The more labor intensive farming operations appear to provide a larger percentage of total income from farm sources.

- Farmers participating in government sponsored production adjustment programs tend to receive a larger percent of total income from farm sources. However, there are exceptions due to the type of farm, for example, grain production is a relatively low labor intensive enterprise and provides the farm operator time to employ his services elsewhere.

Information received from farmers on ways to improve the profitability of their operations is shown in Table 5. Overall, 31 percent of the farmers indicated that the cost/price squeeze situation must be improved. This means that farm prices must be improved in relation to farm production costs. Responses in Table 5 conform to the problem areas identified in Table 1.

"Improve agricultural markets," was listed as the second major concern. This was especially relevant for poultry and egg, peanut, and vegetable farmers. Many farmers felt that reduced real estate taxes and less government intervention were two areas that would also improve their profitability situation.

Other areas mentioned by farmers were reducing agricultural imports; improving the agricultural labor situation; assistance to beginning farmers; more research; more effective land-use planning; and reduction of trade barriers.

It is very evident from the previous discussion that ways to improve the economics of agriculture and forestry are numerous and varying in nature. This study, however, addresses methods suggested by Virginia farmers as well as other methods identified by members of this Commission and agricultural leaders throughout the State.

Prior to discussing major areas, with supporting recommendations, to improve the profitability of Virginia agriculture and forestry, agricultural and forestry trends and projections are presented. These trends and projections are based on historical changes and are modified to reflect realistic expectations within Virginia's agricultural economy. The projections show expected changes in the structure of agriculture. Supporting recommendations are made to provide a healthy agricultural environment in which these changes can more effectively occur. It is believed that the adoption of these recommendations will enable a more optimistic realization of the expected structural changes over the longer term with a resulting realization of opportunities for growth of the industry of agriculture and increased profitability from agricultural production.

Table 1. Major problems expressed by Virginia farmers. (Weighted percent)*

Problems \ Type of farm	All Farms	Cattle, Calves	Dairy	Hogs, Pigs	Sheep, Lambs	Poultry, Eggs	Tobacco	Peanuts	Grains	Vegetables	Fruit	Other
Farm input costs too high	56	58	60	46	44	48	52	37	52	59	65	52
Other	10	10	7	15	0	2	15	4	13	19	0	15
Inflation	8	8	8	8	0	23	5	15	3	7	14	15
Low selling price farm commodities	7	7	4	7	0	8	5	8	11	0	21	
Government intervention	5	4	5	5	0	5	6	19	11	11	0	8
Cost/price squeeze	4	4	4	5	25	0	10	4	0	0	0	0
Cost of land too high	3	3	4	5	12	4		3		0	0	
Weather	3	3	2	4	0	6	2	8	5	4	0	0
Inadequate markets	2		2	4	19	4	4	2	3	0	0	0
Encroachment-urban development	2	2	4		0	0	0	0		0	0	6
Total	100	100	100	100	100	100	100	100	100	100	100	100

*A weighting system was used since farmers were asked to list problems in order of importance. A value of "4" was assigned all responses occurring first; "3" for the second; "2" for the third and "1" if the response occurred fourth. The weighted results are listed by percentages.

Table 2. Problems facing Virginia agriculture: rank of importance by type of farm.

Problem / Type of farm	All Farms	Cattle, Calves	Dairy	Hogs, Pigs	Sheep, Lambs	Poultry, Eggs	Tobacco	Peanuts	Grains	Vegetables	Fruit	Other
Farm input costs too high												
Other	2	2	3	2		8	2	6	2	2		2
Inflation	3	3	2	3		2		3	6	4	3	3
Low selling price farm commodities	4	4	6	4		3	6	4	3		2	
Government intervention	5	5	4				4	2	4	3		4
Cost/price squeeze	6	6	8		2		3	7	10			
Cost of land too high	7	7	5	7	4	6	9	8	8			6
Weather	8	8	9	8		4	8	5	5	5		
Inadequate markets	9	10	10	9	3	7	7	9	7			
Encroachment of urban development	10	9	7	10			10	10	9			5

Table 3. Average years of profit from 1968 to 1978.

Type of farm	Average number of profitable years from 1968 to 1978
Grain	5.8
Peanuts	5.7
Poultry and eggs	5.7
Tobacco	5.5
Dairy	5.2
Hogs and pigs	4.8
Cattle and calves	4.6
Other	2.2

Insufficient information was reported by fruit, vegetable and sheep farmers.

Table 4. Percent of total farm income obtained from the sale of crops and/or livestock.

Type of farm	Income from crops and livestock as total income (percent)
All farms	67
Poultry and eggs	91
Tobacco	84
Dairy	81
Peanuts	75
Hogs and pigs	71
Cattle and calves	62
Grains	57
Other	53

Insufficient information was reported by fruit, vegetables and sheep farmers.

Methods \ Type of farm	All Farms	Cattle, Calves	Dairy	Hogs, Pigs	Tobacco	Peanuts	Grain Crops	Other*
Reduce cost/price squeeze	31	29	34	32	32	29	32	18
Lower real estate taxes	9	9	8	8	0	0	10	46
Change inheritance tax laws	3	4	2	8	0	0	0	0
Less government intervention	9	10	8	4	4	0	13	0
Reduce agriculture imports	3	4	6	0	0	0	0	0
Improve agricultural markets	12	9	12	12	25	0	23	18
Improve agricultural labor situation	2	4	0	0	4	0	0	0
Provide assistance to beginning farmers	3	3	3	4	4	0	0	9
More agriculture research	6	5	0	12	11	14	7	0
More effective land use planning	2	2	3	4	0	0	3	0
Improve relationship/farmers	2	3	3	0	0	0	3	0
Reduce trade barriers	5	5	2	8	6	29	0	0
Do not know	5	5	9	0	4	14	0	9
Other	8	8	10	8	10	14	9	0
Total	100	100	100	100	100	100	100	100

*Other includes sheep, lamb, wool, poultry, eggs and vegetables.

HIGHLIGHTS OF THE 1970's AND PROJECTIONS FOR THE 1980's

Agriculture is Virginia's largest economic sector. In 1979, agriculture produced commodities worth $1.65 billion at the farm level, employed about 80,000 farm workers, had assets of $10 billion, and generated $4.6 billion of activity annually in the general economy.

During the 1970's, the Commonwealth's farmers expanded production, improved yields and adapted to changing conditions and technologies. The 1970's saw a continuation of major historical trends: larger but fewer farms, more purchased and less farm-produced inputs, higher yields on less acres, more machines and less workers, more farm marketings and less on-farm consumption, and greater borrowings and less self-financing. (See Appendix A for graphic details on trends and projections for Virginia agriculture.)

As the 70's came to a close, some of trends appeared to slacken or reverse. Soaring land prices and record high interest rates dampened farm investment and enlargement. Skyrocketing energy costs stimulated energy conservation and the possibility of on-farm production of gasohol. Ways were found to better utilize animal wastes and thereby reduce chemical fertilizers. Integrated Pest Management (IPM) was expanded to reduce pesticide use. Some farmers became more involved in marketing of their fruits and vegetables directly to the consumer through pick-your-own, roadside markets, and farmers markets.

Future historians will decide whether the '70s was a decade of transition to a new era of the '80s. However, it is clear that the '80s will challenge U.S. agriculture to maintain its leadership as the world's most productive industry while discovering effective responses with a minimum of adverse secondary effects to the concerns which emerged during the 1970's.

The 1970's might be characterized not only by expansion but by unprecendented ups and downs. The 1970's may be called the decade of discontinuity—of boom and bust in both prices and production.

Supply-Demand Shifts

Price instability was caused by large shifts in national supply-demand balances. On the supply side, severe corn blight, widespread droughts, and bumper yields caused multi-billion bushel production fluctuations which created high price waves throughout the world's economy. The 10 year cattle cycle resulted in U.S. cattle numbers increasing by 20 million to reach a high of 132 million in 1975 and again plummeting a record 20 million head by 1979. This cycle stimulated large price movements in the entire livestock sector.

On the demand side, the major event of the 1970's was the quadrupling of farm exports from $8 billion in 1970 to $32 billion in 1979. The export surge was led by the 18 million ton Russian Grain Deal of 1972. In late 1979, the Russians, due to a bad harvest, were again back after large amounts of U.S. grain and will likely import a whopping 25 million tons. In 1974 and 1975, world grain stocks reached a 20-year low of 114 million metric tons and fears of massive starvation hit the headlines. In 1979, the stock reached a record high of 230 million metric tons while the international community is still debating a world grain reserve.

Domestic demand for agricultural products grew slower during the 1970's than in the 1960's due to slower population and income growth. Disposable personal income measured in constant dollars increased by 33 percent in the 1970's compared with 46 percent during the 1960's.

Large fluctuations in domestic demand, export demand, and production resulted in even larger fluctuations in prices received by farmers. In Virginia, average monthly corn prices varied $2 per bushel, wheat prices $3 per bushel, soybeans $8 per bushel, feeder calves $75 per cwt., and hogs $45 per cwt.

Rampant Inflation

Inflation—the general movement in prices—was a distinct feature to the 1970's. During the 1970's, the Consumer Price Index increased 85 percent compared with 24 percent during the 1960's. The

Index of Prices received by farmers increased 117 percent during the 1970 s following an increase of 28 percent during the 1960's. However, the Index of Prices paid by farmers increased 140 percent during the 1970's compared with an increase of 24 percent during the 1960's to substantially tighten the cost/price squeeze on farmers. Through more efficient production practices and higher yields, Virginia farmers were able to increase net incomes in spite of the adverse cost/price situation. The gyrations in production and prices generated peaks and valleys in net farm income. In 1973, net farm income in Virginia reached an all-time high while in 1976, it reached a 30 year low.

Government Interventions

At times during the 1970's, government interventions in agriculture were unprecedented. For the first time during peace, ceilings were placed on raw agricultural commodity prices and soybean exports were embargoed. Farmers were exhorted to "plant fence row to fence row," fertilizer and agricultural chemical shortages occurred, and bans were placed on the usage of several major agriculture chemicals and pesticides.

Farm Trends During the 1970's

Declining Farm Numbers.

Farm numbers have been declining and farm size has been increasing in Virginia for at least 40 years. Actual declines in Virginia farm numbers and increases in average farm sizes have not been as rapid as the 1974 Farm Census data indicate because of a change in the agricultural census definition of a farm and because inflation affected the sales value of farm production. Prior to 1974, a farm was listed in the agricultural census if it had an annual gross sale of $50 or more. The new farm census in 1974 included only farms with annual sales of $1,000 or more. Although the shifts—after adjusting for inflation and definitional changes—are not as dramatic as the census figures indicate, they are significant. During the 1964-74 decade, under the old census definition, the number of farms decreased from 80,354 to 58,277. Under the new farm definition and in constant dollars, the number of farms declined from 60,353 in 1964 to 52,699 in 1974. Thus depending upon the basis, the total number of farms during the 1964-74 decade declined by 8,000 to 22,000. Actually, the number of farms with less than $40,000 annual sales declined by over 18,000 in number and 35 percent in value of sales, whereas farms with more than $40,000 sales increased by 500 in number and 36 percent in sales.

Increasing Income and Assets.

Although the net farm income trend was unsteady during the 1970's, it was generally above the levels of the 1960's in constant dollars. Gross income per farm increased by 50 percent and net income increased by almost 150 percent (Table 6). This increase was due to both increasing income levels and declining farm numbers.

The farm asset increase was mostly due to rapidly increasing farm real estate values. Real estate values per acre increased from $492 in 1970 to $864 in 1979 in constant dollars.

Farmer equities increased by a healthy $1.9 billion and the debt-to-asset ratio increased slightly but remained below the 16.8 percent national ratio. Assets per farm measured in 1979 constant dollars increased from $116,000 in 1970 to $180,000 in 1978.

Slowing Crops and Accelerating Livestock.

Trends in production, yield, and Virginia's share of U.S. production for the most major crops slowed in the 1970-77 period relative to the 1955-70 period. Production of potatoes, wheat, hay, sweet potatoes and barley actually declined during 1970-77. Yields of tobacco, soybeans, potatoes, wheat, and barley declined while yields of peanuts, corn, and sweet potatoes increased at a slower pace. Virginia's share of U.S. production, an indicator of Virginia's relative agricultural growth, declined during the 1970-77 period for all major crops except tobacco.

Production trends during 1970-77 for Virginia livestock products were not much more favorable than crop trends. Production of cattle and calves, hogs, sheep and lambs declined. The U.S. share of

Virginia cattle and calf production declined whereas milk and sheep increased. Milk production increased at a modest 1.1 percent annually.

Trends for poultry were much more encouraging than either crops or livestock. Production of broilers, eggs and turkeys grew rapidly and Virginia's share of U.S. for all three increased, reversing a declining trend during the 1955-70's. The U.S. share of all farm products produced in Virginia has been declining since the late 1950's and, as mentioned previously, during the 1970's the share of crop production dropped quite rapidly while the poultry share grew rapidly. Thus, agriculture in Virginia has been shifting towards livestock and poultry relative to crops and relative to other states.

Forest Industries.

Virginia is experiencing significant changes and problems concerning the balance of timber harvest versus timber growth. Estimates by the Virginia survey of timbers in 1967 and 1977 indicate softwood timber harvest is exceeding regeneration of timber by new growth while new growth in hardwood is exceeding harvest. Gains and losses in timber marketings are indicated as follows:

– Softwood sales for sawtimber increased 15 percent while softwood sales for pulpwood and other products decreased 58 percent (when cash receipts are corrected for inflation).

– Hardwood sales for sawtimber increased 40 percent; hardwood for pulp, paper, etc., increased 10 percent.

For further information on trends and projections concerning Virginia's agriculture and forestry, see Appendix A and Appendix D.

Projections for the 1980's

Farm Numbers and Size.

Projections for the 1980's, assuming a continuation of the trends of the 1970's, have been developed. These projections do not represent goals which should be sought. They can best be interpreted as extensions of historical trends. They provide a basis for appraising their consequences and implications if allowed to continue. Recommendations highlighted in this report, if developed, could cause significant changes in these trends to benefit Virginia's agriculture.

The projections of farm numbers and sales in Table 7 indicate a decline of 11,000 farms and an increase of $400 million in the value of farm products. The two largest classes of farms–those with annual sales per farm over $56,000 will continue to grow in both numbers and sales. The five smallest classes will decline in numbers but remain fairly constant in sales. More than 80 percent of the 1990 sales is projected to come from the two largest farm sales classes comprising only 15 percent of the farms. If present trends continue, in 1990 the 2,700 largest Virginia farms will be producing as much as 76,000 farms produced in 1970!

Income and Assets.

Cash receipts are projected to reach $1.8 billion by 1990 (Table 6), when measured in constant 1979 dollars. Production expenses are projected to rise faster than cash receipts and a drop of net farm income to $300 million is projected. Net income per farm is projected to remain at 1978 levels despite more than a 50 percent increase in gross income per farm.

The 1990 projected balance sheet indicates a continued upward trend in real estate assets and debts (Table 6). The debt-to-asset ratio is projectd to worsen (i.e., increase), but still remain below the U.S. average. Total assets are projected to increase to $15.3 billion. The increase in real estate values accounts for over 80 percent of the increase in assets. Real estate values are expected to exceed $1,300 per acre by 1990. The projected growth in assets coupled with a decline in farm numbers will result in tripling assets per farm from 1970 to 1990 when measured in constant dollars.

The projected $400 million increase in gross farm income and asset values may appear too low, unless it is realized that these projections are based upon constant dollars. In current or inflated dollars, the increases would be much larger. For example, if inflation is measured by the Consumer

Price Index continues at the rate of the 1970's, the projected values for 1990 in Table 6 would be increased by 85 percent. Needless to say, it is hoped that "double digit" inflation does not persist through the 1980's. It does not, however, appear overly pessimistic to assume at least a 6 to 8 percent annual inflation rate for the 1980's.

Commodities.

Expansion or decline in production of a particular commodity depends upon its supply-demand situation. The future demand is based primarily upon U.S. population and income and exports. The future supply depends largely on yield increases brought about by new technologies, unpredictable weather and diseases, and production costs. USDA economists have projected likely future supply-demand levels for most commodities for the 1980's.[2] Virginia's production projections for individual commodities were derived by multiplying USDA "baseline" projections for 1990 by a projection of the Virginia share of U.S. production. Thus, Virginia commodity projections depend upon two separate projections: projection of the Virginia share of U.S. production and projection of U.S. production. Projected Virginia shares were based upon the trends in the shares during the 1960's and 1970's.

The largest 1990 projected production increases over the 1976-78 levels are for livestock and poultry (Table 8). This is due to two factors: growth in demand for livestock and poultry and an increase in Virginia's share of national production. A projected value of production increase was calculated by applying the 1976-78 average prices, measured in 1979 dollars, to the production increases. It is possible, and indeed likely, that 1990 relative prices will differ from 1976-78 prices. Thus, the projected values should be considered as approximations without adjustments for inflation.

Projected values of production increases are largest for broilers, cattle, turkeys, and hogs and milk. Virginia sheep and egg production is projected to remain about the same. Crop production in Virginia is not projected to increase as much as livestock. Virginia is projected to maintain but not increase its national share for most crops. Soybeans and apples are projected to have the largest increases in value of production. Potatoes, sweet potatoes and tobacco value of production are projected to decline. Corn, wheat, barley and peanut production may increase moderately.

Of special note, tobacco, traditionally the leading cash crop in Virginia is projected to decline by $11 million. Peanuts, another important cash crop, are projected to increase by only $5 million.

The total projected increase for the 1976-78 to 1990 period is $311 million. This is below the $400 million increase projected in cash receipts in Table 7. These projections are not strictly comparable because the $311 million increase in Table 8 is for selected commodities. Thus, these separate projections are reasonably close to each other.

These commodity projections have implications for the various farming regions in the Commonwealth. Three regions in particular, Shenandoah Valley, Southeast and South Central, are faced with very different prospects. The prospects for Shenandoah Valley region in the 1980's look favorable. The major commodities produced in this region—cattle, poultry, and apples—are likely to expand during the 1980's. On the other hand, the major cash commodities produced in the Southeast and South Central regions—tobacco, peanuts, wheat and barley—are projected to increase slowly or decline. Income from soybean production, which is projected to expand, or other new enterprises may be needed to offset the slow expansion in this region's traditional crops.

The South Central region also contains considerable idle farmland. Perhaps grain, livestock, or forestry could expand in this area and utilize the under-utilized land resources.

Farmers' Intentions to Adjust Resources in Farm Operations.

The Commission's survey of Virginia's farmers indicated that about 70 percent of those responding expect to keep the size of farm and mix of crops and/or livestock rather constant over the next few years. Many farmers, however, can be expected to expand operations. As shown in Table 9, the following appears likely:

– Overall, it appears that Virginia agriculture will witness expansions in beef, hogs, and grain production while other commodities appear likely to be produced at near current levels.

– Most farmers reporting intentions to expand operations were relatively young and generally had a higher level of formal education.

– Operators of larger sized farms indicated intentions to expand further.

– Farmers with higher levels of income indicate more intentions to expand than lower income farmers (Table 10).

Table 6. Actual and projected farm income, expenses, and balance sheet for Virginia in constant 1979 dollars.

ITEM	Year		
	1970	1978	1990
INCOME		Billion Dollars	
Cash Receipts From Marketing	1.1	1.3	1.8
Non-money and Other Farm Income	0.2	0.3	0.3
Total Income Gross	1.3	1.6	2.1
Production Expenses	1.1	1.2	1.8
Net Farm Income	0.2	0.4	0.3
BALANCE SHEET			
Physical Assets			
Real Estate	6.0	8.0	11.8
Non-Real Estate	2.1	2.5	3.3
Financial Assets	0.4	0.3	0.2
Total Assets	8.5	10.8	15.3
Liabilities			
Real Estate Debt	0.6	0.9	1.5
Non-Real Estate Debt	0.4	0.5	0.7
Total Liabilities	1.0	1.4	2.2
Proprietor's Equities	7.5	9.4	13.1
Debt-to-asset Ratio (%)	12.4	13.0	14.3
PER FARM		Dollars	
Gross Income	17,800	26,700	46,700
Net Income	2,700	6,700	6,700
Assets	116,000	180,000	340,000

Table 7. Projected number and value of sales by farm sales classes for 1980 and 1990 in constant 1979 dollars. (Old Census Definition)

Farm Sales Classes	1980 Farms	1980 Value of Sales	1990 Farms	1990 Value of Sales
		Millions		Millions
over $140,000	2,300	$ 750	2,700	$ 1,030
56,000 to 139,999	1,800	320	4,000	430
28,000 to 55,999	3,500	120	2,700	130
14,000 to 27,999	4,800	90	3,600	90
7,000 to 13,999	7,000	60	5,200	50
3,500 to 6,999	7,400	60	5,800	70
under 3,500	27,200		21,000	
	56,000	$ 1,400	45,000	$ 1,800

Table 8. Actual and 1990 projections of U.S. share, production, and increased value of selected commodities for Virginia

COMMODITY	VA Share of U.S. Production		VA Production		1/ Value of Production Increase
	1976-78	1990	1976-78	1990	1976-78 to 1990
	percent		millions		million dollars
Livestock:					
cattle & calves (lbs.)	.99	1.0	400	530	62
hogs & pigs (lbs.)	.86	.9	163	240	39
milk (cwt.)	1.56	1.65	19	21	23
sheep & lambs (lbs.)	1.64	1.8	12	14	1
					Sub. 125
Poultry:					
broilers (lbs.)	2.84	3.5	368	650	81
turkeys (lbs.)	6.19	7.5	136	240	44
eggs (doz.)	1.28	1.3	83	80	- 2
					Sub. 123
Crops:					
soybeans (bus.)	0.59	0.60	9.4	14.3	34
apples (lbs.)	4.65	6.00	329.0	470.0	21
corn (bus.)	0.65	0.65	43.0	47.0	10
peanuts (lbs.)	8.03	7.00	291.0	313.0	5
wheat (bus.)	0.40	0.30	6.5	7.6	4
barley (bus.)	1.08	1.10	4.5	6.1	3
potatoes (cwt.)	0.93	0.80	3.3	2.9	- 2
sweet potatoes (cwt.)	6.21	4.00	0.8	0.6	- 2
tobacco (lbs.)	7.12	7.20	144.0	136.0	-11
					Sub. 63
					Total 311

1/ Calculated by multiplying the projected production increase by the 1976-78 average U.S. price received by farmers converted to 1979 general price level by use of the Implicit GNP Price Deflator - an increase of 16 percent.

Table 9. Intentions of farmers to adjust their farming operations ( ).

Intended change \ Type of farm	Cattle, Calves	Dairy	Hogs, Pigs	Poultry, Eggs	Tobacco	Peanuts	Grain	Vegetables	[illegible]t	Other
No change	70	73	46	83	67	75	78	67	100	[illegible]
More crops	6	8	4	0	10	0	11	33	0	13
More cattle	13	8	21	17	7	0	3	0	0	24
More hogs	4	1	21	0	3	25	0	0	0	0
More poultry	1	1	4	0	0	0	3	0	0	13
Other	6	8	4	0	13	0	5	0	0	13
No answer	0	1	0	0	0	0	0	0	0	0
Total	100	100	100	100	100	100	100	100	100	100

Table 10. Demographic characteristics (average of respondents) of Virginia farmers by intentions of change in farming size (1978).*

Intention of change	Overall			Cattle and Calves			Dairy			Hogs and Pigs		
Characteristic	Expand	Reduce	No Change	Expand	Reduce	No Change	Expand	Reduce	No Change	Expand	Reduce	No Change
Age (years)	50.0	63.5	61.3	45.6	63.1	56.3	45.6	63.2	56.3	50.4	64.7	59.3
Education **	2.33	1.92	2.08	2.38	1.92	2.15	2.14	2.5	2.0	2.28	2.16	1.83
Size of farm (acres)	431	301	286	344	340	278	658	269	326	502	257	321
Total income ($)	91,136	58,030	41,048	64,687	46,395	24,866	140,714	103,000	93,437	148,928	56,250	19,583

Intention of change	Poultry and Eggs			Tobacco			Peanuts			Grain Crops		
Characteristic	Expand	Reduce	No Change	Expand	Reduce	No Change	Expand	Reduce	No Change	Expand	Reduce	No Change
Age (years)	49.0	---	57.8	47.4	56.0	60.3	39.0	51.0	52.0	48.0	69.0	62.3
Education**	3.0	---	1.75	2.4	2.16	1.91	2.5	3.0	2.0	2.4	1.25	1.8
Size of farm (acres)	130	---	169	377	143	329	262	669	895	467	224	267
Total income ($)	53,750	---	40,000	52,000	68,750	38,863	87,500	350,000	108,333	82,500	43,750	37,174

Intention of change	Vegetables			Fruit			Other		
Characteristic	Expand	Reduce	No Change	Expand	Reduce	No Change	Expand	Reduce	No Change
Age (years)	---	80.0	---	---	---	47.0	49.5	70.0	63.3
Education **	---	1.0	---	---	---	2.0	2.0	2.0	2.3
Size of farm (acres)	---	121	---	---	---	509	79	223	131
Total income ($)	---	5,000	---	---	---	95,000	22,500	15,000	13,333

*In each type of farming enterprise, only farmers intending to expand the size of their farming operation were considered under the "expand" subtitle; only those farmers intending to reduce the size of their farming operation were considered in the "reduce" category; and only those farmers responding that they would keep farming at the present size were considered in "no change" category. Characteristics are average values for applicable farmers who responded to the "intentions of changing size of farming operation" question.

**Education is expressed as the average level of education where:

Elementary = 1
High School = 2
College = 3

SUMMARY OF THE 1970's AND THE 1980's

The changing of a decade is an opportune time to review the past and anticipate the future. Agriculture in Virginia during the 1970's experienced expansion and improvement, but these trends were not smooth and even. Prices, production and incomes all experienced record ups and downs. These ups and downs had as significant an impact on Virginia farmers as did the overall trends. A major contrast of the 1970's with the 1960's was the rapid inflation in prices and costs.

Total farm numbers declined and average farm size increased. Actually, the number of larger farms which have annual sales in excess of $40,000 increased. But, the large decrease in the smaller than $40,000 annual sales category caused an overall decline. Both gross and net farm income increased during the 1970's. On a per farm basis, net farm income increased from $2,700 in 1970 to $6,700 in 1978.

Rapidly rising real estate values brought about an increase in farmer equities. In constant 1979 dollars, the value of farm real estate per acre increased from $492 in 1970 to $864 in 1979. Although farm debt increased faster than assets, the overall debt-to-asset ratio remained favorable compared to the national average.

The trends in Virginia's production, yield, and share of U.S. production for most major crops slowed in the 1970's. Livestock trends were not much more favorable than the crop trends and poultry production trends were quite encouraging.

The trends of the 1970's were used to develop projections for the 1980's. Farm numbers are projected to decline and farm sizes to increase. Cash receipts in 1990 are projected to increase but production expenses will increase even faster resulting in a drop in net farm income. Asset values are projected to increase primarily due to an increase in real estate values.

Projections for the leading farm commodities suggest that Virginia will shift more to a livestock and poultry producer. Two traditional mainstays of farm income–tobacco and peanuts–are projected to decline and increase slightly, respectively. Soybeans and apples are the two crops projected to increase most during the 1980's.

In summary, Virginia agriculture expanded during the 1970's and continued expansion is expected during the 1980's. The expansion was not without its ups and downs nor was it uniform across commodities and farming regions. Furthermore, there appears to have been a slow-down in the expansion in crop production and a shift towards livestock and poultry production. Overall, Virginia's agriculture is not keeping pace with agriculture in the nation. Renewed efforts are needed in the 1980's to ensure that a further slow down does not occur and that Virginia's largest sector accelertes its progress. Recommendations highlighted in this report provide a focus for such efforts.

MAJOR AREAS AFFECTING THE FUTURE PROFITABILITY OF VIRGINIA'S FARM AND FOREST ECONOMY WITH RECOMMENDATIONS

The remainder of this study addresses nine areas that will affect the future structure and profitability of Virginia's industry of agriculture. The following areas with supporting recommendations are:

- Agricultural resources
- Farm production costs and market prices
- Markets and marketing
- Transportation
- Agricultural technology and research
- Small and part-time farmers
- New farm and forest enterprises
- Preservation of agricultural land
- Laws and regulations

Agricultural Resource Availability And Use

Availability and effective management of resources are crucial to the future profitability of Virginia's industry of agriculture. This section examines the present status of major resources needed to produce food and fiber and addresses conditions, trends, and problems affecting resources. Major resources addressed are: land, water, timber, energy, facilities and equipment, labor, management, and capital.

Farms occupy 9.7 million acres or 38 percent of Virginia's area. Land is where the agricultural production process begins and is one of the distinctive resources of farming. Land is immobile, fixed in supply and has multiple and competing uses. It accounts for 57 percent of total farm assets.

While farmland continues to be a major factor of production, it is becoming a more important issue of concern. Some of the major concerns are:

- Rapid inflation in land prices may become an insurmountable entrance barrier to new farmers.
- Foreign and off-farm owners are gaining control of farm land.
- Prime farm land is being irrevocably converted to urban uses.
- High land taxes are forcing farmers to sell to speculators and developers.
- Erosion of top soil is seriously reducing future land capability and polluting rivers and streams.
- Increasingly farmland must be sold to settle an estate and pay the taxes and thereby making it impossible to pass the farm to the next generation.
- Increased use of fertilizers and chemicals may be adding toxic materials to the environment.

Some governmental actions or activities addressing Virginia's land resources are:

– Enactment and funding of a master plan to complete survey and mapping of soils throughout the entire state by 1990. This accelerated project has completed surveys in 36 counties and cities and surveys are underway in 20 localities and are scheduled for 40 additional local jurisdictions. Funding has also resulted in the training and development of additional soil scientists to direct and implement the project.

– Passage of a constitutional amendment and enactment of the Land-Use Assessment Act in 1972 which allows localities to enact ordinances allowing owners of agricultural, horticultural, forest and open spaced land to apply for assessment base on productive use values. These ordinances, which affect tax burden aspects of profitability, have been enacted in 54 counties and 12 cities.

– Enactment of the Agricultural and Forestal Districts Act in 1978 which allows local jurisdictions to establish districts, upon application by property owners,which will restrict land use to agricultural and forestal purposes for an established period of time. Such districts will be assessed and taxed on the basis of use. Since enactment, seven counties have established a total of 16 districts with a total of 37,750.79 acres. Several counties are considering the establishment of additional districts in the near future.

– Preparation of soil conservation needs inventories in 1958 and 1967 which indicate that 52 percent of the non-federal rural land in Virginia needs conservation treatment of some kind. The 1977 Erosion Inventory indicated a statewide average erosion rate of 6.6 tons per acre per year for all cropland. Erosion rates range from 2.9 on Class I land to 11.7 on Class IV E land which comprise the vast majority of acreage used for crops. Erosion rates of 5 tons or less, depending upon soil type and slope, are considered acceptable for maintaining productivity. Unless success is achieved in reducing topsoil loss, serious reductions in soils capability will occur in some parts of the State during the 21st century.

– Completed inventories of prime and productive agricultural land in at least eight counties. Six additional counties will be completed by September 1980 and plans are being implemented to complete inventories of the entire site by 1995. In the meantime a new general soil map indicating percentages of prime and productive agricultural land in each soil association is being developed for all counties.

– Developed statistical estimates which indicate total farmland in Virginia has declined 18 percent (from 11.9 million acres to 9.7 million acres) between 1967 and 1979. Unofficial projections indicate an additional decline of 300,000 to 500,000 acres by 1985. Many previous farm forests have been classified as non-farm forests but total acres of forest land in Virginia have not significantly changed over the past few years.

–The General Assembly subcommittee on a proposed Virginia Resource Information System has found that state agencies, local governments, and planning districts have an urgent need for up-to-date land use and soil capability information. Such information is needed for planning purposes on highways and utilities, sub-division and commercial developments, recreational areas, and planning for the preservation of productive agricultural and forestal lands in and around Virginia's growing communities.

Water.

Although Virginia has an abundance of water overall, local problems have occurred especially in Northern Virginia and Tidewater Virginia which restricted water use by off-farm sectors. Production agriculture experiences serious drought problems in most sections of the State at least once every five years. For certain locations and soil types, irrigation may mean a difference between profit and loss during certain seasons. Significant developments on Virginia's water resources include:

– Comprehensive river basin studies conducted by the Bureau of Water Control Management and the State Water Control Board were completed in 1972. These studies projected irrigation needs by river basins for the year 1980, 2000 and 2020 including "once-in-ten-year" droughts.

– A prototype plan for developing and maintaining a comprehensive water use inventory in Virginia has been developed by state agencies with the U.S. Geological Survey. A pilot study now underway includes systems to determine annual water uses by seasons for production agriculture, off-farm agriculture, and other sectors of Virginia's economy. Based on results of the pilot study,

a statewide system, beginning in 1982, is anticipated.

– Enactment of the Ground Water Act of 1973 for the conservation, protection and beneficial use of groundwater. This Act permits restriction of large scale water users in declared groundwater management areas. Agricultural and livestock water activities, however, will not be restricted.

– Drought, floods and other disaster emergency plans for agriculture in Virginia have been developed by the Department of Agriculture and Consumer Services in cooperation with the Office of Emergency and Energy Services. These plans provide:

- Means of assessing problems when emergencies occur.

- Advice to the Governor when emergencies become critical.

- Information to the public on measures available to cope with emergency problems.

- Coordination of state services and federal services relating to drought emergencies.

–Enactment of a state law providing authority for the Governor to make state funds available to fill gaps in federal aid for emergency drought conditions.

–Development of an Agrio-Environmental Monitoring System to measure temperature, water availability and other related factors affecting crop production. The system, developed by Virginia Polytechnic Institute and State University in cooperation with the National Aeronautics and Space Administration, uses a series of measuring devices throughout the State and computer models to indicate needs for irrigation, pest management practices, and other crop management needs. This system when fully developed and recognized by farmers, is expected to have a very important impact on production and management decisions.

Timber.

Virginia's recent survey of timberlands indicates a continuing serious problem of softwood harvest in excess of new growth, particularly in the Coastal Region where forest land has diminished 2 percent in the past 10 years. The survey also indicates that hardwood growth exceeds timber harvest in most areas of the State. Both pine and hardwood regeneration are affected by undesirable varieties and inferior trees. Improvements of pine stands is most cost-effective during the first few years of establishment. Hardwoods benefit from early improvement, but economics generally dictate stand maintenance decisions when merchantable products can be removed. Public efforts to cope with timber production needs include:

– Enactment of the Virginia Pine Reforestation Act in 1972. This Act provides funds to assist property owners in site preparation and pine tree planting activities.

– Continuation of the Federal Forest Incentives Program which provides additional assistance similar to the Virginia Pine Reforestation Program.

– Amendment of the Virginia Seed Tree Law which increased requirements for leaving healthy seed trees when timber is harvested.

– Action by the State Forester, as directed by the Governor, in development of a comprehensive plan by 1983 which will address timber demands, wildlife concerns, forest uses, environmental protection and long-term consideration of forest resources.

– Delegation of the State Forester to coordinate activities in development of wood energy sources. Increased use of wood for home heating along with industrial uses of wood for energy are being explored. The destructive distillation of wood producing methanol is still considered cost prohibitive, but consideration of this process is reported to be near the break-even point when and if the price of oil reaches $25.00 per barrel.

Virginia's timber industry which has a work force of nearly 75,000 people represents one sixth of the manufacturing work force in Virginia. Additional information is contained in the Forest

Recommendations Pertaining To Land, Water and Timber Resources

Resource Information.

Timely, accurate and up-to-date information is needed for effective decisions relating to resources by state, federal and local governments and by the private sector. To meet this need, it is recommended:

A. That the 1980 General Assembly give strong support to the continued development of the proposed Virginia Resouce Information System. This project, if effectively funded and developed, will provide up-to-date, timely and accurate information for decisions by the General Assembly, Executive Branch Agencies, local governments and the private sector on: issues affecting soil, water, atmosphere, and other natural resources in Virginia; man-made installations which impact on resources; and socio-economic factors relating to resources. Information of particular importance to agriculture will include:

   – Land use and land use shifts affecting agricultural production.

   – Data on Virginia soils, land classification and productive capability.

   – Timely information on soil temperature and moisture, and other climatic or environmental factors for decisions affecting crop production (the Virginia Polytechnic Institute and State University's Agrio-Environmental Crop Management Model).

   – Water use inventory data concerning annual needs for irrigation, non-irrigated crop forest production, production of livestock, poultry and for manufacturing and processing food and fiber in Virginia. (The Virginia Water Use Data System is now being developed cooperatively by the U.S. Geological Survey and selected state agencies.)

B. That Virginia Cooperative Extension Service cooperate with the Department of Housing and Community Development, Soil and Water Conservation Commission, Department of Conservation and Economic Development, and Department of Agriculture and Consumer Services in developing and implementing a continuing comprehensive statewide educational project on issues affecting farm and forest resources in Virginia. The purpose of this project will be to better inform citizen groups, civic groups, farmers, youth, planners and governing bodies and public agencies at local, regional an state levels on:

   – The importance of soil and other natural resources in rural areas of Virginia and the vital role of agriculture in Virginia's economy.

   – Benefits of preserving productive agricultural and forest lands for watershed protection, scenic natural beauty, and for recreational purposes in an atmosphere where farm and forest production can continue to grow and prosper.

   – Practical approaches to preserve productive agricultural land for agricultural, horticultural and forestal uses.

   – Effective strategies for dealing with agricultural land use planning aspects of state and federal environmental regulations and for long-run resource needs.

Resource Management.

Effective management of resources is crucial to profitability in agriculture to conserve natural resources for continuing profitable operations in future years. To improve resource management, it is recommended that:

A. Biennial budgets of the Commonwealth of Virginia allocate sufficient funds to the cooperative soil survey and mapping project for completion of this according to the master plan by 1995.

B. State agencies, planning districts and local governments make routine use of soil capability information in decisions affecting land use.

C. Pilot work by the U.S. Department of Agriculture Soil Conservation Service be accelerated to complete preparation and publication of prime and forest land maps as soil surveys are completed in each county.

Conservation of Natural Resources.

Protection of natural resources (soil, water and others) from damage and losses while promoting high levels of farm and forest production presents a significant challenge to the Commonwealth. More than half of the non-federal rural land in Virginia needs conservation treatment of some kind. Since more than two million acres of Virginia's land have been retired from farming operations or converted to other uses since 1967, there is a real need to maintain production capability and to preserve resources for agriculture and future generations. It is recommended:

A. That all state agencies with responsibilities relating to land management, land grant universities, and local governments take steps to achieve the objectives of the Clean Water Act through voluntary means relating to non-point source pollution control and to reduce soil losses from erosion and sedimentation in Virginia to levels recommended by the U.S. Department of Agriculture Soil Conservation Service. Specific steps include:

– Education, technical assistance, and promotion services on voluntary use of recommended Best Management Practices on agriculture and forestry non-point source pollution control.

– Cooperation with property owners in obtaining federal and cost-share assistance for the installation of agricultural and forestal Best Management Practices which primarily benefit the public.

– Statewide assessment of non-point source pollution problem areas to:

- Concentrate state/federal technical and financial assistance in watersheds having critical non-point source pollution problems.

- Develop research and demonstration projects to clarify the effectiveness of proposed Best Management Practices on water quality.

- Increase funding to the Virginia Soil and Water Conservation Commission for "pass through" funds to Soil and Water Conservation Districts for technical and educational services on the applicability of various options available in applying Best Managemeent Practices.

- Provide tax incentives for the purchase and/or use of specialized equipment necessary to install Best Management Practices.

B. That the role of the Soil and Water Conservation Commission and Soil and Water Conservation Districts be strengthened in dealing with issues relating to the Soil Erosion and Sedimentation Control Law and that local jurisdictions rigidly enforce erosion and sediment control ordinances.

Energy.

National estimates indicate that agriculture uses about 3 percent of the annual energy resources for the production of food and fiber, 7 percent for processing and manufacturing purposes, and 5 percent for assembly and distribution of agricultural products. However, United States agriculture produces a large part of the world's food supply. For example, production from one out of every three acres in the United States is exported to the rest of the world.

Needs for adequate and timely supply of energy for agricultural production have been recognized in the U.S. Department of Energy Allocation System but problems and potential problems of energy shortages in off-farm agriculture have received less attention. Significant developments concerning energy for Virginia agriculture include:

– Designation of agricultural production with a priority of 100 percent of motor fuel needs under the Department of Energy Allocation System. This priority was modified effective August, 1979 to allow agriculture 100 percent of historical fuel purchases based on purchases for a similar time in previous years.

– Designation of production agriculture and the processing and distribution of agricultural products with a Number 2 priority for natural gas behind needs for home heating, hospitals and related installations.

– Increased interest in development on non-fossil fuels. Many agencies and groups in the private sector have begun investigations related to this opportunity. This Commission recognized the need for centralizing leadership on this issue and communicated its concerns to the Governor in August, 1979. In September, 1979 the Governor designated the Virginia Department of Agriculture and Consumer Services as lead agency to coordinate studies, demonstration projects, marketing issues, and other matters related to industrial alcohol for motor fuel purposes. The Commissioner of Agriculture and Consumer Services immediately established a Department Task Force. This Task Force is currently developing programs and procedures that can be used by the private sector. Although research information previously indicated that industrial alcohol production for motor fuel purposes was not cost/effective, the rising cost of fossil fuels, new and more economical production systems and conversions of by-products for livestock feeds or other economical uses have indicated that this product, particularly for motor fuel purposes in farm machinery, is becoming more cost/effective.

– Development of a detailed report on Estimated Energy Consumption for Virginia's Agricultural Industry in June 1979 by the Department of Agriculture and Consumer Services. These estimates indicate the amounts of diesel fuel, gasoline, liquefied petroleum gas, fuel oil, natural gas, electricity, coal and wood consumed in crop production, livestock and poultry production, major agribusiness operations and forest products manufactured in Virginia. Energy consumption for Virginia's off-farm and on-farm agriculture was developed from information obtained from a survey of major agribusiness organizations in Virginia and by the application of research data from the U.S. Department of Agriculture to statistical estimates of livestock, poultry and crop production throughout the State. The report has been favorably received by agribusiness leaders, the Virginia Office of Emergency and Energy Services and by agricultural leaders at the national level.

–A very significant inflationary impact of price increases for petroleum products on most segments of the economy including the industry of agriculture. Although measurable data are not available, it appears that all sectors of the industry of agriculture are taking significant steps to reduce energy requirements and to improve efficiency in the use of energy. Some of the changes to cope with energy shortages and energy costs include:

- Purchase of diesel powered equipment and larger scale equipment which reduces energy requirements per unit of production.

- Improved maintenance of motorized equipment to reduce fuel requirements.

- Improved insulation in buildings to reduce heating and/or cooling costs.

- Expanded use of minimum tillage practices and integrated pest control practices to reduce energy requirements and pesticide costs.

In order to cope with energy problems, continuing efforts are needed in development of alternative energy sources, conservation of energy by existing operations, and efforts to improve fuel efficiency. Studies by industry leaders indicate that very few scientific barriers exist that prevent substantial improvements of efficiencies in the use of energy resources.

Recommendations for Energy Resources

Improved management of energy, development of alternative energy sources, and conserving energy resources is becoming increasingly important to all sectors of Virginia's economy. Agriculture has a potential capability of producing energy through conversions of solar radiation, forest products,

waste materials, feed grains and other biomass materials into other forms to serve its own needs and parts of the non-agricultural economy. It is recommended:

A. That steps be taken by the Department of Agriculture and Consumer Services, Office of Emergency and Energy Services, and the Governor to give a top priority for necessary energy resourcees in food and fiber production, marketing, processing and distribution. Some of the necessary steps include:

– Establishment of routine statistics on seasonal requirements of all energy needs by type and purpose in Virginia for planning districts or other regional designations (as a part of the Virginia Agricultural Statistical Reporting System).

– Clarification of the cruicial needs of adequate and timely energy resources and the "multiplier effect" of spot energy shortages on the entire production, marketing, processing and distribution system.

– Development of information material for use with state and federal agencies and the general public on the importance of energy for agricultural enterprises and how shortages will affect the general public.

– Providing information to insure public support for an adequate Federal priority on energy that will assure necessary fuels of all types for all sectors of agriculture.

B. That research and demonstration projects be developed in cooperation with Virginia Land Grant Universities and other agencies and organizations on alternative non-fossil fuels that can be economically developed for agricultural production and/or marketing purposes to include:

– Alcohol for farm production machinery as a substitute for gasoline and diesel fuel.

– Solar heating systems to augment or substitute for other energy resources in homes, other farm structures, and for crop drying purposes.

– Wind power and water power for electricity generation where economically feasible.

– Further study of the potential of methane generating systems in livestock and poultry operations in order to provide energy resources and recycle waste materials through the production of other valuable products.

– Effective uses of wood products as fuel by further emphasis on:

-Research designed to facilitate and expedite uses of wood residues and small hardwoods for energy.

-Demonstrations and other educational projects designed to educate and assist the public in efficient, safe and effective use of wood for heating.

-Development of pilot projects to assist business enterprises and others in expanding the use of wood for heat production and in providing marketing services for wood, including sawdust, wood pellets, raw wood and other wood products for industrial and home heating purposes.

C. That the Department of Agriculture and Consumer Services maintain a high priority on its designated responsibilities for developing a program for the production and marketing of industrial alcohol in Virginia for fuels in such products as "gasohol" in order to:

– Coordinate activities to facilitate the establishment of industrial alcohol plants.

– Work with individual farmers, producer cooperatives and commercial enterprises in the production, use and sale of industrial alcohol for fuel to include:

- Development of markets

- Promotion of markets

- Acquisition of raw materials and facilities

- Use or sale of residues

– Minimize additional rules and regulations affecting production and use of industrial alcohol for fuel.

– Coordinate work with the Alcohol Beverage Control Commission in its responsibilities for policing the use of industrial alcohol while it is in its potable stage.

D. That the General Assembly amend the Code of Virginia to release landowners from liability resulting from injury by individuals who purchase firewood or who remove firewood free of charge for home heating purposes.

Facilities and Equipment.

Farmers have made major investments in buildings, machinery and equipment during the past decade. The value of machinery and motor vehicle assets has almost tripled since 1970. These investments have been made in order to reduce labor costs, to meet increasingly stringent agricultural waste and pollution requirements and to intensify production. Repairs, operation and depreciation of buildings and machinery account for a third of total farm production expenses. These management decisions are of a long-term nature and errors are difficult and expensive to correct. Once constructed on the farm, buildings have very low salvage values and hence become sunk costs. Motor vehicles and equipment, although not as "fixed" as buildings nevertheless often are difficult to sell. Thus, investment decisions relating to facilities and equipment are of major importance to financial success or failure.

Recommendations for Facilities and Equipment

Facilities and equipment selection, acquisition, use, maintenance and updating are significant factors that affect profitability of agricultural enterprises. It is recommended:

A. That Virginia's Land Grant Universities conduct information and educational projects for more effective decisions on the acquisition, use and maintenance of facilities and equipment for improving current and long-term profitability of agricultural enterprises. Services to include:

– Information for decisions on crop production equipment to assure adequate match of equipment sizes and types to production requirements.

– Technical assistance in selection of design and use of buildings and facilities for dairy, poultry, swine, and other livestock enterprises and in waste management facilities for profitable operations and future long-run expansion and development of operations.

– Increase emphasis on maintenance and updating equipment for long-term operations at minimum cost.

B. That the Land Grant Universities make effective use of information provided by the Virginia Water Use Data System, now under development, as an adjunct to the research and demonstration projects affecting irrigation in order to reduce costs and increase profitability particularly in seasons when droughts occur. That emphasis be given to projects concerning:

– Cost and returns from irrigation on different crops and soil types.

– Balancing the impact of increased energy and equipment costs with increased income from higher and more certain yields.

– Access of economical, dependable, and high quality water supply for irrigation.

– Evaluations of proposed legislation and regulations in terms of their potential impact on farm irrigation.

C. That Virginia Polytechnic Institute and State University increase research and education concerning grain storage and drying systems with emphasis on reductions of crop drying costs through the use of solar drying systems.

Labor and Management.

The major trend in farm employment in Virginia has been a reduction in the number of workers but an increase in quality or skill level of workers. On-farm labor declind by one-third during the past decade. Declining number of workers but rising farm output has been made possible by the substitution of machinery, equipment and other capital inputs for labor. Although the number of workers has been declining, the skills required to successfully farm in today's increasingly complex and rapidly changing technical and economic conditions have increased. Today's science-based agriculture with high levels of capital investment per worker – higher in fact than capital investment per worker in the non-farm sector – requires both knowledge of technical agriculture and business management. The rapid technical advance in agriculture means that education must be a continuing life-long process. The Virginia Cooperative Extension Service founded by the passage of the Smith-Lever Act of 1914, has had the basic role of conducting educational programs and disseminating the best available science based information. Recent national surveys indicate that the Cooperative Extension Services and the Land Grant Universities are a leading source of information for farmers.

Another reason for decline in number of farm workers, in addition to mechanization, is that many jobs formerly done on the farm have been transferred to the agribusiness sector. Employment survey data indicate off-farm agribusiness employment in 54 different occupations ranging from accountants to zoologists.

Despite the rapid mechanization in agriculture, many tasks remain which require seasonal workers. Fruit, vegetable and tobacco growers experience peak labor demands during the harvest season which cannot be met by family or full-time workers. Obtaining seasonal workers is becoming more difficult due to the scarcity of local seasonal workers and the increasing governmental labor regulations.

Recommendations on Labor and Management

A real challenge facing the industry of agriculture is assuring an adequate work force with the necessary competence to meet year-round and seasonal needs for agricultural enterprises. This issue concerns not only the availability of workers but also the effective management of workers and other resources in order to carry out operations in a timely, efficient and profitable manner. It is recommended:

A. That continued efforts be made by state and federal agencies to: coordinate regulatory inspection services; reduce duplications of effort; prevent unnecessary interference; improve services relating to seasonal and migrant agricultural labor; and to improve the practicality of occupational safety and health regulations. Such efforts should recognize the needs for competent and reliable workers throughout the industry of agriculture at all times.

B. That efforts be made by the entire industry of agriculture to place key emphasis on business management and business decision making in planning and programming its work for the 1980s. Specific issus to consider include:

– Use of appropriate management and professional assistance for farm operators and others in the industry in providing tools for decisions by managers.

– Better use of contractual arrangements for seasonal services and for other services where special facilities or expertise are needed.

– More reliance on well developed plans and business records to assure effective use of labor and other resources.

Capital.

All sectors of Virginia's industry of agriculture are adjusting to increasing needs of capital in order to maintain and improve operations. Table 11 indicates significant changes in farm debt, real estate mortgages, and non-real estate debt since 1967. During this period, some major changes in the farm debt structure are:

– Mortgage debt holdings by Federal Land Banks and by the Farmers Home Administration have increased rapidly and these two types of institutions own almost half of the total farm mortgage debt in Virginia.

– Holdings of non-real estate debts have increased tenfold by the Farmers Home Administration and more than three times by Production Credit Association. Significant increases in debt holdings by the Farmers Home Administration occurred primarily after the 1977 drought disaster which affected many agricultural areas of Virginia.

Recommendtions on Capital

Availability of sufficient capital and a satisfactory cash flow in agricultural enterprises require effective managemnt of resources in order to achieve a satisfactory return on investment and to assure sufficient capital for future operations. It is recommended:

A. That lending institutions, merchandisers of farm supplies and equipment and the Governor's Agricultural Credit Committee give increased attention to long range financial and credit needs of the entire industry of agriculture.

B. That the Governor's Agricultural Credit Committee further consider needs and benefits of an agricultural credit authority quite similar to Virginia's housing authority and eductional loan authority to generate additional capital specifically for agricultural production enterprises.

C. That the Governor's Agricultural Credit Committee's Agricultural Credit Handbook be further developed in order to serve effectively as a business management tool for farmers, farm suppliers and lending institutions.

D. That Virginia Polytechnic Institute and State University further emphasize services in farm management with particular attention to the management and use of financial resources.

Table 11. Virginia farm liabilities and mortgages interest rates 1967-1979

Year	Total farm 1/ liabilities (millions)	Total farm debt (millions)	Real estate debt (millions)	Non- 2/ real estate debt (millions)
1967	N/A	385	269.9	115
1968	N/A	424	298.8	126
1969	N/A	453	318.2	135
1970	571	498	345.6	152
1971	594	528	363.8	164
1972	644	574	388.0	186
1973	698	629	416.0	213
1974	802	733	487.5	246
1975	937	859	584.9	275
1976	1,033	955	662.3	292
1977	1,114	1,022	719.4	303
1978	1,280	1,171	787.8	384
1979	1,415 3/	1,369	872.8	496

Source: USDA, Economics, Statistics, and Cooperatives Service, Balance Sheet of the Farming Sector, 1979, AIB No. 430 (Washington, August 1979) Table 14.

1/ This amount includes real estate debt, non-real estate debt, commodity credit loans, and merchant and dealer debt.

2/ This figure includes commodity credit corporation loans.

3/ Unofficial estimate

Agricultural Costs and Market Prices

Agriculture along with other segments of the economy, is facing an extended period of inflation and market prices for most commodities are not keeping up with rapidly increasing costs of production. Although the impact of inflation on costs of operations and on capital investments is felt by all farm production enterprises, this effect is particularly serious for new and expanding operations. Specific effects of the cost-price squeeze are:

- Reduction of returns to investment and management in farm operations.

- Reduction of available cash reserves to take advantage of opportunities as they arise.

- Increased farm debt in relation to operator's assets, accompanied by rising financing costs and high interest rates on borrowed money.

- Rising prices in the off-farm sector and increasing spread between producer and consumer prices for food and fiber.

Conditions, Trends and Problems.

Profit is a very important part of any business enterprise and in fact, is the key that drives our entire free enterprise system. Farm operators or managers of any other enterprise will not remain in business over a long term unless there is a reasonable profit on investment and a reasonable return for management. Although Virginia's net farm income for 1978 was the second highest on record, it only yielded an average net income per farm of $5,100. This is a small payment to cover the farmers' equity investment, family labor and management. Although data are not available for Virginia, it is interesting to note that the ratio of earnings to asset equity was only 3.6 percent in 1978. Except for 1972-1974, this 3.6 percent is approximately equal to the average for the 1970's. In actuality, this can be considered as the farmer's return on production assets.

Farmers are traditionally known as "price takers" since they, as individuals, cannot determine the price of what they sell. However, many groups of producers have, through cooperative efforts or participation in government-sponsored supply adjustment programs, been able to have a voice in the pricing of their farm production. Others have used forward pricing mechanisms such as hedging or forward contracting as a part of their marketing strategy to overcome some of the uncertainties of the market. Many non-farm business which supply production inputs to farmers or process and handle farm commodities are better able to pass through added costs.

This two-sided market structure, within which the farm sector operates, has allowed a cost/price squeeze to exist for many years. As a result, farmers find themselves faced with ever-decreasing profit margins while simultaneously increasing their productivity. Over the years, farmers' ability to stay in business has basically come from gains in productivity. From 1970 to the present, farm production per worker has increased on the average of about 5.8 percent each year, while the non-farm sectors in the American economy have shown a yearly increase of less than two percent. It is thus easy to see why the farm sector is, in many cases, frustrated with their lack of profits.

Virtually all sectors of the agricultural economy have been facing rising costs of production and fluctuating market prices. Costs of selected farm production items are shown in Table 12.

Increasing prices for labor, energy, buildings, and equipment have sharply increased costs for processing, transportation, and distribution of farm products and increased the farm to consumer marketing spread. Changes in farm prices and consumer prices for selected items in 1967, 1973 and 1978 are shown in Table 13.

Table 12. Selected farm production costs

	1967	1973	1978	Percent Change 1967-1978
Tractor, wheel, 50-59 belt HP	$ 5,700.00	$ 6,450.00	$ 10,500.00	+ 84%
Grain combine, self propelled, 12-14 ft.	8,200.00	18,000.00	38,950.00	+ 375%
Corn planter, fertilizer attachment, 4 row	800.00	1,450.00	3,340.00	+ 317%
Fertilizer, 5-10-10, per ton	46.75	55.50	93.25	+ 99%
Carbaryl (sevin) wettable powder, 8090 per 10 cwt.	77.00	99.00	187.00	+ 142%
Soybean meal (44%) (cwt)	5.64	14.08	13.00	+ 130%
Farm labor (average cost per hour)	1.12	1.71	2.63	+ 132%
Taxes on farm property (average per acre)	1.59	2.84	4.68	+ 194%

Source -- Virginia Crop Reporting Service

Table 13. Changes in Virginia farm prices and consumer prices, selected items, 1967 to 1978.

Item	1967	1973	1978	Change Compared to 1967
Beef slaughter, cattle, producer price per cwt.	$ 18.60	$ 37.40	$ 40.60	+ 118%
Round steak beef, consumer price per cwt. (equivalent)	127.30	183.10	225.20	+ 77%
Milk, grade A, producer price per cwt.	6.20	8.05	11.10	+ 79%
Milk, retail price, per cwt. (equiv.)	13.14	15.72	21.02	+ 60%
Wheat, producer price, per bushel (60 pounds)	1.41	2.90	3.05	+ 116%
Bread, consumer price, per pound	.24	.33	.49	+ 104%
Apples for market, producer price per pound	6.2¢	12.4¢	16.1¢	+ 160%
Winesap apples, consumer price, per pound	.21¢	.32¢	.53¢	+ 152%
Broilers, producer price, per pound	14.5¢	23.7¢	24.9¢	+ 71.7%
Broilers, consumer price, per pound	40.7¢	55.3¢	59.1¢	+ 45%
Slaughter hogs, per cwt.	19.30	38.00	45.50	+ 136%
Bacon, consumer price, per pound	.82	1.30	1.86	+ 127%
Consumer price index	100.	133.1	195.4	+ 95.0%
Prices received by Virginia farmers, (index, 1967 = 100)	100.	162.	208.	+ 108%
Prices paid by farmers (commodities, interest, tax, and farm wage rates), U.S. (index, 1967 = 100)	100.	143.	218.	+ 118%
Prices paid production items (index, 1967 = 100)	100.	112.	266.	+ 126%

Source -- Producer Prices: Virginia Crop Reporting Service

Consumer Prices: Division of Research and Statistics, Department of Labor and Industry

Markets and Marketing

The marketing system which moves agricultural and forestry products from the land on which they are produced to the consumer is complex and has many facets. Many variations are necessary to accommodate the many products moving into the system, the many forms in which these products reach the consumer and the geographical distribution of the consumer.

This system must provide an opportunity for the products of the farm and forest to enter it, and to process, package, and distribute them to the consumer while at the same time maintain the quality of the product and make it available to the consumer in an orderly and desired manner.

The services provided by the marketing system account for more than 60 percent of the consumer cost. The costs of the services vary widely by the type of product. The marketing system for meat products costs the consumer about 45 percent of the retail cost while the marketing system for cereal and bakery products accounts for about 84 percnt of their retail costs. The amount of processing required and the convenience desired by the consumer contribute to the costs of the marketing services.

The development of agricultural and forestry products in Virginia will depend largely on the ability of marketing systems in Virginia to:

- Provide convenient points of entry to producers.

- Operate efficiently and at the lowest possible cost.

- Be structured to maintain prices at levels which will provide the necessary production incentives.

- Deliver the products to the consumer in the desired manner at competitive prices.

Virginia farms and forest lands are strategically located on the doorstep of the largest single segment of U.S. consumers and with a major port through which large quantities of agricultural products move to foreign lands. This location should increase in importance as transportation becomes more expensive and less readily available.

In making this study, a number of marketing techniques, services and current marketing situations were considered. Recommendations were developed which suggest efforts be made to improve the marketing systems by the application of one or more marketing techniques or services.

Marketing Techniques or Services

Among the marketing techniques or services considered were:

Electronic Marketing.

The Virginia Department of Agriculture and Consumer Services pioneered the development of electronic marketing with the development of the Tel-O-Auction for feeder pigs almost 20 years ago. Electronic marketing enables buyers to bid effectively on producer offerings by electronic means without being physically presnt at the point the commodity is being offered for sale. An electronic marketing system must be supported by procedures that will develop accurate descriptions of the producers' offerings to enable the buyers to buy with confidence without being physically present. This marketing system appears to work best where it is supported by a strong and active producer organization that is able to develop units of sale needed for efficient pick-up and transportation. It appears reasonable to suggest that an electronic marketing system can be expanded to include virtually all kinds of livestock and crops produced in Virginia, if strong producer organizations can be organized to support the system and procedures are developed to handle the specific commodity. Experience with electronic marketing indicates that it can make a market more readily available, reduce the cost of the marketing system, improve its efficiency, increase the convenience of the point of entry, and impact favorably on competitive factors.

Direct Marketing.

A shortage of harvest labor and small production capability have encourged some producers to turn to direct marketing techniques through such programs as "pick-your-own", roadside stands, and local farmers' markets. Through these programs, the consumer can usually obtain a higher quality product at less cost and the producer can receive a higher proportion of the product value. Producers who wish to engage in this type of marketing have special technical needs related to production for this type of marketing.

Commodity Promotion.

The profitability of agricultural production in Virginia and the overall economy in Virginia can be increased by the effective promotion of food produced in Virginia and the promotion of Virginia food products in export markets.

Market Information and Analysis.

Timely and accurate information and analysis are essential for producers and producer associations to develop profitable marketing strategies. This information must be collected quickly and accurately and disseminated by the most effective means possible. The producers' profitability can be enhanced by having access to the latest available information on market conditions, supply and demand, and other factors which affect market trends.

Product Quality Grading.

Marketing programs of the future will depend more and more on a system of product quality grading that will eliminate the need for visual inspection by the purchaser before the price is determined. Accurate description of the product in accordance with established standards is essential for the operation of electronic marketing systems.

Producer Marketing Associations.

Many producers of agricultural and forstry products in Virginia are small and lack the capability of assembling sufficient quantities of products to attract large volume buyers and to handle their products efficiently. In a number of instances, this problem has been overcome through the use of producer marketing associations through which a number of producers can contribute their production to that of a group and thereby achieve the volume requirements necessary to have more power in the market place.

Export Marketing Facilities.

Virginia ports offer exporters the following advantages:

More frequent shipping.

Favorable port services.

Excellent grain handling facilities.

A nonunion port at Richmond.

However, Virginia ports are losing agricultural shipments to ports in North Carolina, South Carolina, and Baltimore because of freight and handling cost advantages.

Marketing Opportunities for Commodities

A review of current situations relating to the marketing systems of specific agricultural and forestry products indicates there are a number of opportunities where improved marketing conditions would provide an incentive for farmers to increase production, allow for greater profitability from this production, and increase agriculture's contribution to the economy of Virginia.

Cattle and Calves.

Marketing statistics indicate a high percentage of the calves produced in Virginia move out of Virginia for feeding, finishing, and slaughter. Current construction of a large scale cattle slaughter facility in Jarrett, Virginia, should provide an excellent opportunity for many of these calves to be fed and finished in Virginia.

Hogs and Pigs.

For many years the number of hogs processed in Virginia has exceeded the number produced on Virginia farms. At the same time, a high percentage of the feeder pigs produced on Virginia farms move to out-of-state feeders. As transportation costs increase, the movement of pigs into other areas for feeding and the movement of hogs from other areas for slaughter will become more expensive. This indicates that the pork industry in Virginia should find increased profitability in feeding out a larger number of the feeder pigs produced and, thus, supply a larger percentage of the slaughter hog needs.

Sheep and Lambs.

The decline in nearby processing facilities for sheep and lambs in Virginia makes it necessary for producers to seek more distant markets. An opportunity to improve the marketing system for sheep and lambs may exist through the development of local processing facilities that would reduce transportation costs and shipping losses.

Dairy.

Proximity to large population centers has provided an opportunity for continued expansion of dairy production in Virginia. Through the use of cooperatives, Virginia dairymen have developed and operate a marketing system that handles milk in an efficient manner and one that is convenient to the producers. However, the same level of marketing efficiency does not appear to exist in the movement of cull cows, a valuable by-product of the dairy industry, to the processor.

Horses.

The horse industry is growing and increasing as a contributor to the economy of Virginia. It is felt that opportunities exist for significant growth through development of both domestic and export marketing programs.

Poultry and Eggs.

Production of broilers and turkeys in Virginia has increased significantly over the past few years; however, Virginia remains a egg-deficit state. Opportunities appear for further expansion in the poultry and egg industry if adequate supplies of grain for feed can be obtained at reasonable costs. With increasing transportation costs and transportation difficulties, increased production of grain in Virginia should be an opportunity for both the grain producers and the poultry industry. As increasing transportation costs drive up feed costs, the potential for profitable use of unused and underutilized acres in many areas of Virginia for grain production should increase.

Feed Grains.

The proximity of the export market and the opportunity to expand livestock and poultry production in Virginia should provide opportunities for increased grain production. This opportunity should be further enhanced by increased transportation costs caused by higher energy and equipment costs. Virginia has substantial unused or underutilized cropland available that, through research, production and marketing programs, may be made profitable.

Tobacco.

Worldwide demand for tobacco is increasing at a rate of about 3 percent per year. Almost half of the tobacco produced in Virginia is exported. The proportion of the world market for tobacco supplied by Virginia and U.S. growers is declining because, in the minds of many persons knowledgeable in tobacco, the quality/price ratio of Virginia and U. S. tobacco is becoming less competitive in world markets.

Peanuts.

The production adjustment and marketing quota program under which peanuts are produced and marketed in Virginia was recently changed to bring production in line with market demand and make support prices more competitive in world markets. These changes should improve the domestic and export demand for Virginia peanuts and enable growers to increase their production and profitability.

Vegetables.

Although the volume of vegetables produced in Virginia for the fresh market has been holding fairly constant, the acreage devoted to vegetables for the processing market is declining. Marketing problems and an inadequate supply of labor for harvesting are reducing the incentive to produce.

Apples.

Although a large proportion of the Virginia apple crop moves into the fresh market, the year-to-year variation in the profitability of apple production is largely determined by the large shifts in prices received by growers for processing apples. The processing apple market is characterized by relatively large price shifts during the marketing season. Many producers feel that the use of marketing associations, which are legally established under agricultural marketing legislation, may help stabilize the market for processing apples. Some producers in Virginia have requested legislation be enacted to give them an effective tool in marketing processing apples.

Forestry Products.

For many years, the market for forest products has been dominated by large pine saw timber, large quality hardwood saw timber and hardwood veneer. Smaller material moves as pulpwood and wood chips. The advent of chip-'n-saw mills, bolter saws, gang saws and other equipment developments have provided outlets for smaller material and increased the market demand for these materials. The scarcity of fossil fuels and the increased prices of these fuels now provide another marketing possibility for forest products. All grades of pine and hardwood products can now be sold with quality being the determinant of value. The removal of small trees, tops of large trees left after logging, and trees that have reduced potential for providing desirable forestry products in the future can aid in reforestration as well as providing income for the producer. Two specific areas of timber management needs are the removal of top wood and weed trees not used in logging operations and the thinning of hardwood stands to remove low quality trees. Sales of fuel wood by the landowner would help both of these programs. One of the current primary deterrents is the landowners' liability if he allows or sells fuel wood to be cut by individuals.

Recommendations

To asist producers of agricultural and forestry products in Virginia to acieve the potentials offered by opportunities in markets and marketing, it is recommended that:

A. The Virginia Department of Agriculture and Consumer Services, Virginia Polytechnic Institute and State University and Virginia State University:

1. Develop and disseminate production and marketing information that will enable producers to expand cattle feeding programs to provide animals for processing facilities being developed in Virginia and, thus, reduce the movement of calves to more distant feedlots.

2. Develop and disseminate production and marketing information that will enable producers to expand swine production to supply a greater proportion of local processing needs.

3. Improve the efficiency, reduce the costs, and increase the convenience of livestock marketing systems through the use of electronic marketing techniques and producer marketing associations.

4. Determine the feasibility of a slaughter facility for sheep and lambs in or nearby Virginia. In this study, the feasibility of expanding the cattle slaughter facility at Jarrett, Virginia should

be considered.

5. Improve the marketing system for feed grains in Virginia as an incentive for increased grain production on unused or underutilized acreage in Virginia by providing information on feed grain drying and storage facilities, forward pricing techniques, and producer marketing associations. This would reduce the dependence of the poultry industry on imported grain and enable small producers to obtain the marketing advantages normally associated with high volume producers.

6. Develop alternatives within the present tobacco and peanut programs that would enable the producers of these crops to be more competitive in world markets and, thus, increase the demand for these products and the profitability of their farms.

7. Develop marketing programs for the horse industry, such as a horse center, which, with sufficient private and public support, would enable this industry to increase its contribution to the economy of the Commonwealth.

8. Increase efforts to provide technical information to meet the special needs of producers who are interested in and can take advantage of opportunities of direct marketing.

B. The Virginia Department of Agriculture and Consumer Services:

1. Provide more accurate, timely, and readily available market information and analysis by increasing the number of marketing points served by trained reporters and increasing the speed at which this information is collected and disseminated to enable Virginia producers to improve their marketing strategy.

2. Expand the capabilities of commodity promotion activities to include all areas of the state, develop and implement a Virginia retail food promotion program, and provide for the promotion of Virginia food products in foreign lands.

3. Expand the capability of providing quality grading for producers of agricultural commodities on a local basis and support this expansion by a program of training and supervision that would insure approved grade standards being accurately applied by certified graders.

C. The Senate Agriculture, Conservation and Natural Resources Committee and the Agricultural Committee of the House of Delegates appoint a joint subcommittee to study agricultural marketing practices.

D. The Virginia Department of Agriculture and Consumer Services and the Virginia Division of Forestry develop a marketing system that would provide for the assembly and distribution of small and low grade hardwood for energy uses in industrial and home heating. This would help to increase current income from forest lands and encourage the development of more desirable timber stands.

E. The Board of Agriculture and Consumer Services consider appointment of a broad-based task force of livestock producers, marketers, processors, and government officials to identify the opportunities for increased export sales of livestock meat and livestock products from Virginia and to make recommendations to achieve these opportunities.

F. The Virginia Ports Study Commission consider the following recommendations relating to the Virginia ports:

1. Improvements be made in facilities to handle tobacco by containers at Hampton Roads to improve the competitive position of Virignia ports compared to those in the south.

2. High priority be given to improving highway #58 by providing bypasses for Franklin, Courtland, Emporia and South Hill, and by completing the dual highway through Mecklenburg and Southampton Counties to provide better access to the port of Hampton Roads.

3. "No charge" storage time be increased at Virginia ports.

4. The Virginia Ports Authority assume an active role for the state in negotiations with the International Longshoremen's Association on work rules affecting bulk and container shipments of agricultural and forestry products.

5. Negotiations be made to reduce restrictions on transfer between rail lines serving Virginia ports and to improve storage and handling facilities for rail systems.

6. Lash-barge services be encouraged.

TRANSPORTATION

Transportation is a vital part of the agricultural and forestry production and marketing system. Equipment and supplies move to farms from many distant points and the output of farms and forests must be moved to processors and on to consumers. The seasonal nature of agricultural production and marketing and the perishability of many agricultural products require non-uniform transportation needs. Timely and adequate transportation, which may be complex, is critical to the success of many agricultural operations.

Intercity rail and truck transportation costs accounted for 8.2 percent of the marketing costs of farm food products in 1977.

The rapidly increasing costs of fuel, equipment, and labor are causing transportation costs to rise rapidly. Equipment shortages and labor difficulties have, on a number of occasions, impeded movement of farm commodities and caused significant losses to producers.

Virginia's location near a large segment of the domestic market and with fine export facilities within her borders, suggests the transportation problems may not be as large as are found in more distant areas; nevertheless, many production and processing facilities are highly dependent on a good transportation system to move farm inputs from distant areas and farm producers to processing plants at some distance. Virginia's poultry industry imports a large proportion of its corn and soybean needs from the Midwest; a high percentage of the feeder calves and feeder pigs move to out-of-state buyers; and a significant proportion of market hogs processed in Virginia come from out-of-state feed lots to highlight a few of the areas in Virginia's industry of agriculture which are heavily dependent on transportation.

The problems facing the farm sector in dealing with transporttion are quite apparent. While other users of transportation can relocate in response to changes in transportation, technology and operations, agricultural users are tied to their geographical location because suitable land and favorable climates cannot be moved. Contributions which agriculture and forestry make to the economy of the Commonwealth are dependent on a reliable, efficient, economical and equitable transportation system and it is in the public interest for both the public and private sectors to search diligently for solutions to transportation problems that would impede growth and development of agriculture and forestry production and processing in Virginia.

The ability of the transportation system to develop and maintain an effective service is heavily influenced by state and national government actions, such as:

- Laws and regulations affecting load and size limits
- Roads and bridges
- Rates
- Exemption for certain agricultural commodities
- Service abandonment

Recommendations

After reviewing the opportunities for improving the transportation system serving Virginia's

agriculture, it is recommended:

A. That the General Assembly amend current laws to make permanent the temporary 80,000-pound gross weight and 60-foot length limits for tractors and trailers to make these limits more uniform between states and reduce fuel costs per ton of agricultural commodities transported.

B. That the General Assembly consider:

1. Providing an axle weight exemption for producers moving agricultural products from the farm to handling or processing facilities during harvest time since field weighing devices are impractical. This exemption might be limited to 25 miles or less.

2. Creating a transportation equipment authority through which commodity groups needing special equipment such as hopper cars and livestock trailers would be able to obtain low interest loans to purchase this equipment.

3. The feasibility of establishing a separate state agency for all rail planning and operations, now a part of the Virginia Department of Highways and Transportation. Rail transportation needs and concerns of Virginia agriculture and forestry should receive high priority in all state rail planning efforts.

4. Creating an industrial access rail fund, similar to the industrial access road fund, to provide rail access to agricultural facilities such as grain elevators, storage facilities, processing plants and similar installations.

C. That the General Assembly and all Virginia agriculture reaffirm their support for the continuation of the Eastern Shore Rail Line, the loss of which, when Federal subsidies cease on April 1, 1981, will cause serious transportation problems in this area.

D. That Federal laws and regulations be amended to ban seasonal or peak demand rates for agricultural products; to continue use of multiple car rates; and insure continuation of an adequate transportation system for Virginia's agricultural and forestry industry.

E. That the Virginia Department of Highways and Transportation evaluate all rural roads and bridges in Virginia to determine those in need of rehabilitation or improvement to maintain satisfactory access to market from Virginia's farms.

F. That the Commissioner of Agriculture and Consumer Services appoint an Agricultural Transportation Advisory Committee, made up of representatives of Virginia's industry of agriculture having the greatest utilization of transportation. This Committee will recommend actions to solve transportation problems in Virginia's agriculture.

G. That the Virginia Department of Agriculture and Consumer Services continue efforts to increase the use of:

1. Virginia's inland waterways for the transportation of agricultural commodities, including an increase in livestock, container, break bulk and bulk shipments.

2. Air shipments of agricultural products.

IMPROVED TECHNOLOGY AND AGRICULTURAL RESEARCH

The knowledge and technology necessary for the future growth of agriculture are inadequate. Most of the scientific basis for technological innovations in agriculture come from research and educational institutions. Strong evidence is available which indicates that a higher priority of the Commonwealth's resources should be assigned to agricultural research. Justification of this rests upon the high economic return to Virginia from agricultural research, the depletion and obsolescence of our knowledge base, and the relatively static level of the state's support in real (deflated) dollars over the decade despite significant increases in general tax resources.

Improvement in knowledge and technology is the foundation upon which an abundant and

wholesome food supply is built. Increases in efficiency of agricultural production brought about by new knowledge and technology are responsible for about 80 percent of the production increases in recent years. By improving their efficiency, Virginia farmers during 1970-78 have been able to expand production by 23 percent while using 13 percent less land and 25 percent less labor. Agricultural research contributes to the quality of life by:

- Decreasing production costs and expanding yields
- Improving food quality and developing new products
- Reducing the producer's risk to adverse weather, disease, and insects
- Increasing society's capacity to anticipate and respond to problems.

Virginia has a diversified agriculture due to the varied climatic and geographical regions. Research needs vary significantly from region to region, from commodity to commodity, and change from year to year. For example, the rapid rise in energy prices has increased the need for research on ways to conserve energy and discover substitute energy sources. The research agenda is constantly changing to resolve today's problems and anticipate tomorrow's. The future success of Virginia agriculture depends to a great extent upon maintaining a strong agricultural research base and scientific capacity to add to that base.

The contributions of agricultural research to productivity increases are well documented. A recent article by Evenson, Waggoner, and Ruttan in the September 14, 1979 issue of Science summarizes 32 different studies of the returns to agricultural research. These returns consistently were found to be 20 to 30 percent – at least double the returns on typical investments. In Virginia, it has been conservatively estimated that each dollar expended on agricultural research has returned $2.45 in increased production.

At present, the reserves of technology are dwindling and new knowledge is being consumed faster than it is being produced. The depletion of our technological reserve stems from four principal factors:

Obsolence.

– The new technologies of agricultural research become obsolete in 5 to 10 years. For example, the "Blueboy" wheat variety occupied a high of 58.5 percent of state's acreage and was very instrumental in raising Virginia's wheat yields by 9 bushels per acre during the 1968-72 period. However, in 1972 powdery mildew and glume blotch attacked Blueboy and by 1979, its use had dropped to 1.2 percent and the state yield had dropped back near previous levels.

Inflation.

– Inflationary costs and scientific research have outstripped the growth in state and federal agricultural research appropriations. After taking inflation into account, state general fund expenditures for the Virginia Agricultural Experiment Station have been below 1967 levels in six of the past eleven years. During this period state support has totaled $869,008 less than it would have if 1967 levels had been maintained. After adjusting for inflation, federal appropriations have been below 1967 levels each of the past eleven years resulting in an accumulated reduction of $3,949,249 of research funds.

Low Priority.

– Leadership in science and technology is eroding as the proportion of our tax funds and personal income spent on research and development has declined. During the 1967 to 1976 period, state general fund expenditures for the Agricultural Experiment Station declined by 30.5 percent relative to state and local tax returns and by 20.6 percent relative to personal income.

Defensive Research.

– The share of public agricultural research directed toward non-production oriented or "defensive" research has increased as funds have been diverted to meet government imposed requirements for safety and quality.

There is particular concern in Virginia about the prospect of future crop production increases.

The annual trends in production, yield, and Virginia's share of U.S. production for most major crops declined in the 1970-77 period relative to the 1955-70 period. Production of potatoes, wheat, hay, sweet potatoes and barley actually declined. Yields of tobacco, soybeans, potatoes, wheat and barley declined while the yields of peanuts, corn and sweet potatoes increased at a slower pace. The Virginia share of U.S. production, an indicator of Virginia's relative agricultural health, declined during the 1970-77 period for all major crops except tobacco.

The production trends for Virginia livestock products were not much more favorable than the crop trends. Production of cattle and calves, hogs and sheep and lambs declined during 1970-77. The Virginia share of U.S. cattle and calf production declined. Milk production increased at a modest 1.13 percent annually.

The trends for poultry were much more favorable than either crops or livestock. Indeed, production of broilers, eggs, and turkeys grew rapidly and the Virginia share for all three increased – reversing a declining trend in shares during the 1955 to 1970 period.

A number of factors may have contributed to the slowdown in several of Virginia's crops and livestock. A severe drought in 1977 reduced yields of corn, soybeans and hay. Costs of fertilizers, chemicals and other production inputs have increased dramatically, thereby reducing net revenues and discouraging production expansion.

Administrative and organizational changes of the Virginia Agricultural Experiment Station may also have contributed to the depletion of the research base in Virginia.

The Virginia Agricultural Experiment Station was created and established by the General Assembly in March 1, 1886. It existed as a separate state agency until 1966 when it was consolidated with other areas and placed into the Virginia Polytechnic Institute and State University Research Division. This consolidation, in the opinion of some, has had the unintended and undesired consequence of lowering the visibility and weakening support for agricultural research at a time when accelerated efforts are strongly indicated.

Funding for food and agricultural research in Virginia should be significantly expanded because of:

- The uncertainty of adequate food and fiber supplies at reasonable prices.
- The general erosion of agricultural research capacity.
- Increased responsibilities to maintain and improve the environment.
- Increased responsibilities for safe and nutritionally acceptable food.
- Persistent and formidable yield balance in many commodities.
- Increasingly severe insect, pest, and disease problems facing plants and animals.
- The depletion of technological reserves.

General Research Recommendations

Agricultural research benefits the public and the industry of agriculture in many ways. It is in the public interest of the Commonwealth, therefore, to improve the profitability of Virginia agriculture and forestry through the application of new technologies derived from research. It is recommended that:

A. The Governor and General Assembly establish a clearly defined policy of high priority for the support of agricultural research.

B. Virginia Polytechnic Institute and State University restore the identity and visibility, re-emphasize the importance of, and improve the accountability, operating efficiency and budget authority of the Virginia Agricultural Experiment Station.

C. Virginia Polytechnic Institute and State University assign the Virginia Agricultural Experiment Station the full responsibility for administration of all state agricultural research funds appropriated to Virginia Polytechnic Institute and State University as it now has for all federal formula funds for agricultural research.

D. A broadly respresentative agricultural research advisory council be established by the Virginia

Agricultural Experiment Station to provide advice on the funding and priorities of agricultural research.

E. An annual report of the Virginia Agricultural Experiment Station be submitted to the Governor, President of the University, members of the General Assembly, and to the industry of agriculture.

Specific Research Priority Recommendations

A number of recent studies along with discussions with researchers, agricultural leaders, farmers, consumers and government leaders in Virginia have been used to identify priority areas for future agricultural research within Virginia. The priority areas for agricultural research funding are:

- Basic
- Energy
- Production efficiency
- Natural and renewable resources
- Food processing, marketing and distribution
- Food safety and quality, human nutrition and health
- Agricultural export opportunities.

Basic Research.

Basic research provides building blocks for all applied developmental research activity and opens up new and unanticipated applications to solving practical problems. Areas of basic research which are particularly in need of intensified effort in Virginia include:

- Improved understanding of the basic biological processes undergirding agricultural and life sciences.

- Improved genetic production for existing plants and animals by incorporating new sources of plant and animal germ plasma.

- Developing a better understanding of the relationships of climatic, biological, physiological, and economic factors affecting agricultural management.

- Developing the capability of detecting and identifying potentially harmful drugs, chemicals, and pesticides important to agriculture and the environment.

-Discovery and evaluation of biological insect control methods.

- Discover how to prevent the production of mycotoxins to provide information necessary to develop methods of preventing grain spoilage during storage and transportation.

Energy.

Virginia agriculture is heavily dependent upon a reliable source of energy for production, drying, transporting, processing, and distributing its products. The current energy prices emphasize the urgency for energy conservation and research to develop non-critical energy sources. Research is needed to:

- Develop agricultural production systems which can utilize alternative energy sources and reduce the reliance of agriculture on fossil fuel supplies.

- Investigate renewable and noncritical energy sources such as biomass, solar, wind, and geothermal energy for both farm and industry uses.

- Develop more reliable and efficient systems for the production of methane from agricultural waste products.

- Increase the photosynthetic efficiency of solar energy and biological fixation of nitrogen to

increase crop production efficiency and reduce the use of nitrogen fertilizer.

Production Efficiency.

A continuing supply of technology through research to improve production efficiency is required to meet the expanding demand for food and for Virginia to remain competitive in its production. In this high priority area, the major constraints on food and fiber production at various locations throughout the state should be identified and utilized as a basis for establishing research priorities through which:

- New and improved crop varieties and systems adapted to Virginia's soils and climate and reistent to prevailing pests would be developed.

- Overall production levels, biological efficiency, and production desirability of Virginia's livestock would be improved.

- The reproductive efficiency through control or modification of biological and physiological mechanisms would be developed and the influence of nutrition, disease control, and genetics as they affect reproduction would be determined.

- The biochemical and physiological processes affecting feed utilization would be identified.

- The fertilization and lime needs for soils would be more accurately measured and identified to provide a basis for more efficient fertilization and liming practices.

- Varieties and management practices for grasses and legumes would be improved.

- Peanut varieties with increased disease resistance, earlier maturing dates, and improved market quality and characteristics would be developed and evaluated.

- The use of solar energy, temporary storage systems, low temperature drying and other innovative and economical grain storage and drying systems would be developed.

- The feasibility of irrigation for different crops and soil types would be evaluated.

Natural Resources.

The increasing public concern for conservation and pollution requires research relating to natural and renewable sources which will enhance the effectiveness of public and private decisions to conserve water and reduce pollution, promote the wise utilization and preservation of farm and forest lands and provide less severe and more effective pest control measures. Increased pollution of Virginia's streams, lakes, and ocean bays is a threat to public health, livestock, seafoods, crops, forests, and wildlife. The declining water table nationally is reducing the amount of water available for irrigation and other purposes and increasing energy costs for pumping. Research in this area is needed to:

- Develop control measures for non-point source pollution.
- Provide basic knowledge for establishing land-use policy.
- Develop pollution abatement and environmental enhancement practices.
- Provide more effective pest management systems and less harmful livestock and crop insect and disease control systems.
- Provide an adequate supply and quality of water for agricultural use and management practices which will maximize the returns of efforts to reduce pollution and enhance the utilization of waste in recycling systems.

Health and Nutrition.

There is increasing concern about the health and nutritional consequences of the rising consumption of highly processed and fabricated foods and the consequences of chemicals which have been used historically to increase production, reduce spoilage, and preserve food. Research efforts in this area would:

- Establish environmental conditions which would inhibit growth of toxin producing organisms in

the food supply and develop detoxification or removal methods to remove harmful chemicals.

– Discover the mechanism of resistance of certain anaerobes to antibiotics and thereby increase effectiveness of antibiotics for treating anaerobic bacteria in cancer-causing compounds, peridontal, and other infections in man and animals.

– Measure the economic impacts of regulations on drugs and additives in the food supply and estimate the costs and benefits of alternative regulations.

– Evaluate existing and proposed changes in food grades and standards in terms of the needs of producers and consumers.

Marketing.

Since over 60 cents of the consumer food dollar goes to the food marketing system, an economical, dependable, and wholesome food supply depends on marketing efficiency. In some commodities as much as one-third or more of the product is lost during the marketing process through waste or spoilage. Research in this priority area would:

– Develop new and improved food products to use portions of plants and animals that now are discarded.

– Discover processes, packaging, and handling methods that will reduce marketing losses of raw and prepared food products.

– Develop methods that will preserve nutrient content of processed foods.

– Develop means by which the efficiency and effectiveness of the marketing system may be improved for agricultural, seafood, and forestry products.

Exports.

Virginia is an important national producer of many agricultural products, the production of which is far in excess of the needs for local consumption. There is a continuing need to identify opportunities for expanding foreign markets for Virginia farm products. Research programs in this area would:

– Identify export opportunities for Virginia's agricultural and forestry products.

– Provide technical assistance and other information to developing countries of the world to enable them to become better markets for Virginia's agricultural exports.

Small and Part-Time Farmers

The number of small farms in Virginia has been declining for the past twenty years. Projections indicate that this trend will continue. Census data on farms grossing less than $20,000 annual sales reveal four sub-groups of small farms as follows:

– Low income, full-time farmers - 15 percent
– Potentially commercial full-time farmers - 7 percent
– Part-time farmers - 50 percent
– Retirement farmers - 28 percent.

Problems and opportunities faced by each of the above groups are quite different and programs to serve their needs must be tailored to their specific resource situation, alternatives open to them and personal goals. The following describes each of the above groups:

Low Income, Full-time Farmers

Farmers in this group are those who have very limited resources, do not work full-time off-farm, and have not reached retirement age. Farm sales are insufficient to provide an adequate family

income and their education and skill levels are low. The number of farmers in this category has declined at a faster rate than other small farm groups and the proportion will probably continue to decline.

Potentially Commercial Full-time Farmers

Farmers in this group have access to sufficient resources to profitably incorporate modern equipment and production tchnology into farm operations in order to provide an adequate family living. Operators in this group do not have full-time off-farm jobs and are less than 65 years of age. Farmers in this group have remained around 7 percent since 1959 and can be expected to remain at this level during the 1980s.

Part-time Farmers

Farmers in this group have full-time, off-farm jobs. Farm production resources and sales vary but off-farm employment provides operators with an extra source of income. The proportion of small farmers classified as part-time rose from 36 percent in 1959 to over 50 percent in 1975. The percentage of small operations in this group is expected to increase slightly during the 1980s. It appears that small farm opertors with full-time, off-farm jobs may have a viable means of remaining in agriculture.

Retirement Farmers

Farmers in this group are over 60-65 years of age and the proportion of farmers in this group is expected to rise slightly during the 1980s. Depending upon health and other factors, many retirement farmers are likely to continue farm operations.

New Farmers

This group includes individuals not listed in Census Reports who are seeking to enter production agriculture as farm operators. People in this group face special problems including lack of experience together with high land costs and high equipment costs. Some of this group have been attracted to small farms because they seek to produce food organically or to develop an alternative life-style. Others in this group may have had experience as farm workers or special training which will help them as farmers.

Recommendations

Programs which are developed to assist small and medium-sized farm operations in developing and maintaining a satisfactory life-style must be tailored to meet the needs of the several groups of farm operations and take into account the type of farm operation and the operator's desire. In an effort to provide this assistance, it is recommended:

A. That Virginia Land Grant Universities give particular attention to research and education activities which are especially adaptable to Virginia's nearly 50,000 small and medium-sized farm operations and that specific steps be taken to:

   – Develop educational materials relevant to the economics of production on small farms including fact sheets on production opportunities and farm finance.

   – Expand direct assistance to small farmers through programs using extension technicians.

B. That Virginia's Land Grant Universities and the Virginia Department of Agriculture and Consumer Services:

   – Determine the feasibility of establishing model small farm research and demonstration units where economic enterprises and technology appropriate to production and marketing on small farms can be developed, tested and demonstrated.

   – Utilize agencies such as the Community Service Administration, Community Action Agencies and others to develop mechanisms for expanding assistance to small farms and small farm

groups.

C. That appropriate State and Federal agricultural agencies in rural communities improve their accessibility by opening offices during hours convenient to farmers employed in full-time off-farm jobs.

New Enterprises

Virginia's broad base of soils, water resources, transportation systems and nearby consumer demands are paralleled by a wide variety of agricultural production, marketing, processing and distribution enterprises. Considerable interest has developed in recent years regarding the development of new enterprises in grape and wine production, aquaculture, and use of wood for energy. Although additional data are needed on several production and marketing aspects of these industries in Virginia, business people with similar operations elsewhere have expressed interest in the establishment of these enterprises in Virginia.

Grape and Wine Production.

Enthusiasm by a relatively small group of people regarding the production of grapes is arousing an interest in this opportunity for Virginia agriculture. Experts in the field have suggested that Virginia has many micro-climates with characteristics similar to major wine producing regions in France. Several foreign interests have made significant investments in Virginia real estate, and are now beginning to establish vineyards and to construct wineries. Much of the planning and direction of this work is supported by experts in viticulture and wine making from well established wine production areas.

Table grapes and wine grapes are produced in Virginia and there are successful production operations in each class of grapes. Success by these producers, opinions of experts in the field, and nearby market outlets are strong indicators that grape production and wine making are feasible in Virginia. Competitive advantages which may be considered in decisions on these enterprises in Virginia include:

- Distance to markets for table grapes compared to western suppliers and earlier harvest compared to other eastern production areas.

- Rapid increases in wine consumption.

- High ratings of some Virginia wines by professional wine tasters and judges.

Recommendations

To assist in the development of this new enterprise in Virginia, it is recommended:

A. That Virginia Polytechnic Institute and State University develop a well coordinated research program relating to grape and wine production in Virginia to include:

- Grape varietal research and evaluation.

- Research and production methods for more profitable enterprise management.

B. That the General Assembly amend the Code of Virginia to establish a new Farm Winery Law relating to the licensing of Farm Wineries and tax on table wine made in Farm Wineries and sold in Virginia.

Cage Culture of Channel Catfish.

The production of channel catfish, *Ictalurus punctatus,* in agricultural waters represents a new and rapidly growing farm industry that has caught the public's imagination. Catfish farming is an exciting concept with the potential of becoming one of the major food-producing industries. The recent surge of interest in pond-reared catfish culture has been generated by trade industry reports

of high production and profit potential, particularly when compared to traditional agricultural enterprises. As with most new industries at this state of development, a number of private and corporate investors are contemplating the commitment of considerable resources with little factural knowledge about production values, costs, nature of the demand, and potential technical problems. The absence of reliable information on growth rates and culture methods represents a real constraint to small-scale catfish farming in the state of Virginia.

Recommendations

To provide the information on which this new enterprise may be properly appraised under conditions in Virginia, it is recommended:

That the Virginia Polytechnic Institute and State University establish a small-scale demonstration research catfish culture unit that can be scientifically monitored to assess the potential of catfish farming in Virginia.

Fresh Water Commercial Aquaculture in Virginia.

The regulatory permit process has a significant impact on the development of the aquaculture industry. Since aquaculture operations deal with food production, water supply, water quality, the use of restricted drugs and chemicals, and the use of navigable waters, they are subject to a wide variety of regulations and fall under the jurisdiction of a number of governmental agencies. As many as 30 different agencies at the federal, state and local levels may affect an aquaculture operation in Virginia. Before operations can begin, a prospective aquaculturist may have to invest hundreds of dollars and many months attempting to understand the nature and extent of all the legal requirements. Aquaculturists have stated that many of the procedures to obtain the necessary permits and licenses are confusing, expensive, time-consuming, inflexible, and redundant, and, as such, represent a substantial deterrent to aquaculture development.

The confusion and uncertainty expressed by the general public in the present regulatory system (e.g., Are fishing licenses required for fee fishing?) clearly discourages competitive small-scale aquaculture and represents a very real constraint to aquaculture development in Virginia.

Recommendations

To assist in the development of the fresh water aquaculture industry in Virginia, it is recommended:

A. That a register of permits and environmental requirements relating to fresh water commercial aquaculture in Virginia be compiled and published citing the legal authority, determining agency, applicability, purpose, data required, costs, sources of professional assistance and other relevant information.

B. That these laws and regulations be reviewed to identify changes which would assist the development of fresh water commercial aquaculture in Virginuia.

Use of Wood for Energy.

Increased costs of petroleum based fuels have caused increased interest in using wood and other fibrous materials for heat energy. Pelletized wood and fiber wastes are being used for industrial heating in some places and use of round wood for home heating is increasing. Properly managed, a new enterprise that can make these products available will provide an incentive for forest management as well as supply a portion of energy needs.

Forest based product industries derive 40 percent of their energy needs from wood residues and other industries are finding wood sawdust to be a superior source of heat energy and a lower cost fuel.

Wood pelletizing plants are being established in some areas to convert wood and waste wood into a convenient form of energy.

Primary considerations relating to the development of this new industry are:

– Cost of conversion to wood systems.

– Availability of wood in useable forms.

– Continuous supply of raw materials.

– Cost of wood as a fuel.

Recommendations

To determine the feasibility of establishing this new enterprise in Virginia, it is recommended that wood for energy projects be further developed at Virginia Polytechnic Institute and State University, School of Forestry and Wildlife Resources on:

Research projects relating to:

- Procurement, harvesting, drying and transportation of woody biomass for fuel.

- Effects of outdoor storage on the fuel potential of wood.

- Suitability of various species of wood for fuel.

Studies to determine:

- Degradation of sites and needs for fertilizer with biomass removal.

- Availability of wood fuel from hardwood stand improvement.

Feasibility studies to determine:

- Equipment needed to convert from present systems to wood-using systems.

- Equipment needed to make wood products more available for heat energy systems.

Preservation of Agricultural and Forestry Land in Virginia

One of the more disconcerting structural trends in agriculture today is the shifting of productive agricultural land to nonagricultural uses. There is growing recognition throughout the nation and Virginia of the need for policies and programs to assure that productive agricultural and forestry land will be available for future generations. In Virginia, it is clear from concerns of many farmers, citizens, and local and state officials that solutions are going to have to be implemented at the local level. During the past decade, our nation's agricultural lands have been disappearing at a rather alarming rate. Regardless of how the number of acres being shifted to non-farming uses are interpreted, the point, however, is that we must be concerned about the future structural capabilities of our farms to respond to increasing food demands – both domestic and foreign.

Virginia is particularly susceptible to this phenomenon due to her location in the rapidly growing East Coast region. Virginia is projected to be the sixth leading state in terms of population gains for the next ten years. As her cities grow and populations swell, Virginia must provide additional residential, transportation, and industrial facilities in order to meet the demands of her growing populace. Oftentimes, a direct loser in this process is agricultural land.

The decline of productive agricultural land in Virginia has been estimated by the Virginia Department of Agriculture and Consumer Services to be about 100,000 acres annually for the past decade. From 1979 to 1985, unofficial estimates indicate that about 400,000 additional acres of land will be removed from farming.

The competition for agricultural land between agricultural and nonagricultural uses has become intense in many parts of Virginia. During the past decade, this level of intensity has increased due to relative low financial returns to resources used in farming, high real estate taxes, and the high cost of capital and other production inputs.

Many farmers and citizens in Virginia are sensitive to land-use issues. Many farmers whose land ajoins expanding urban areas have become increasingly vocal about the pressures facing them with respect to shifting of farmland to non-farming uses. Many citizens are very concerned about the possibility of Virginia losing her agricultural and rural identity and open spaces.

In order to obtain specific information about land-use issues, farmers in Virginia were asked why agricultural land was being removed from farming in their areas of the state. This question was part of the farm profitability survey that was discussed earlier in this study. Also, in order to learn in greater detail the type and rate of farmland conversions occurring in Virginia, information was obtained from 16 counties and two cities in Virginia.

Responses from farmers dealing with the issue of why agricultural land is being removed from farming are shown in Table 14. It is evident that the most important reasons for all farms are low financial returns to farming, purchase of farmland for non-agricultural uses, high real estate taxes, and the lack of young persons entering farming. Other problems of somewhat lower importance are construction of highways and industrial parks and high inheritance taxes.

Urban areas were defined in this study as counties experiencing rapid rates of growth and/or high population levels coupled with potential for future rapid growth. When a comparison is made on the basis of urban or rural, urban farmers appear to perceive the same major problems as rural farmers. However, one major diference was found in the purchase of farmland for non-farm uses. Urban farmers felt more strongly that this was a major problem than did rural farmers. Table 14 also contains the perception of problems by type of farm. For example, peanut farmers in rural areas expressed a large relative concern about high real estate taxes and the lack of young persons entering farming.

In the farm profitability survey farmers were asked to list ways that the federal, state or local governments could aid in preserving agricultural land. The analysis of the responses is contained in Table 15. The leading response for all types of farms was the need for real estate tax relief. The second two most important responses were inheritance or income tax relief and more effective tools that could be used by local governments to preserve agricultural land. Other suggestions for all farms and type of farm are contained in Table 15, e.g., hog and pig farmers in urban areas expressed a larger concern for real estate tax relief than did hog and pig farmers in rural areas.

Information obtained from localities also confirmed that there are very different levels of development pressures and subsequent farmland conversions being experienced around the state. Some localities have very little development pressure and are, in fact, encouraging new developments. Other areas are experiencing development pressures that are difficult to control or guide with existing local zoning and planning laws. Existing policy on farmland preservation in Virginia is found in Appendix B, which also contains information on land-use planning tools in other states and information on federal land-use policies and laws.

While it is clear that solutions are going to have to be implemented at the local level, there must be leadership and support from the federal and state governments in developing alternative approaches for the localities to choose to meet the unique conditions for their specific areas. In other words, the solution for Clarke Countyin the northern Shenandoah Valley may be quite unlike that which will meet the needs of the farming community in Virginia Beach. Alternatives that will work in a locality that has already experienced substantial farmland conversions will be more complicated than those in areas of the state not under development pressures. Where comprehensive plans and zoning laws are now being developed, farmland preservation programs should be incorporated. Effective planning must be at the front end of development, industrial siting, large lot zoning, placement of utilities, leap-frog development, and the premature idling of land.

Most responding jurisdictions noted that their local comprehensive plans strongly endorse farmland protection. However, in many instances, this goal may not be attained because of perceived lack of legal authority. Therefore, these localities have expressed the need for clearer direction and authority from the state in order to implement effective local farmland preservation

programs. The intent of the authority is to give local governments the power to control the location and timing of development away from significant agricultural areas. Several jurisdictions would like to initiate farmland preservation programs but lack enabling legislation.

Another problem identified by the study, particularly by small localities such as Clarke County, is the lack of reliable information on the economic value of the agricultural industry to the locality, the region and the state. Agriculture can make a substantial contribution to the economic welfare of the locality, but because of its nature, its role is less visible than that of other industries. As elected officials and community leaders plan for the future, they need to know the direct and indirect value of the existing farming industry as well as the importance of maintaining a stable land base for revenue purposes.

Recommendations

In order to improve efforts and services for the preservation of agricultural and forestry land, it is recommended:

A. That the General Assembly consider an amendment to the Code of Virginia to:

1. Allow continued operation of established agricultural and forestal enterprises unless such enterprises present safety or health hazards.

2. Change Section 15.1-447, Paragraph 1 (A) to include "Production of food and fiber" as a specific factor to be considered in the preparation of local comprehensive plans.

3. Change Section 15.1-489, by adding subsection (8) to read: "To provide for the preservation of agricultural and forestal lands."

B. That the Governor and General Assembly give clear direction to the appropriate agency or agencies to complete an inventory of productive agricultural and forestry land; to document the reasons for land resource shifts; and to project the future relationship of Virginia's agricultural products versus consumer needs in light of the developing energy situation.

C. That Virginia Polytechnic Institute and State University develop a method by which localities can assess the direct and indirect value of the agricultural industry to the local economy.

D. That the Virginia Department of Agriculture and Consumer Services continue to monitor the state's Land-Use Assessment Law and the Agricultural and Forestal Districts Act to determine the effectiveness of these laws and the need for further refinements.

E. That programs based on the concepts of purchasing or leasing development rights as part of the package of property rights be evaluated. The State of Maryland has pioneered some of these programs and specific ones for study include the Development Rights Program (Howard County), Transfer of Development Rights (Calvert County), and the Leasing of Development Rights. Some localities are seriously considering these approaches, but fear they do not have the necessary enabling legislation. It is recommended that a local option "pilot program" incorporating one or all of these concepts be established and evaluated for effectiveness prior to any statewide program. Other alternative tools such as the circuit breaker income tax program which is successful in Michigan and Wisconsin, permanent easement benefits, and changes in property taxation should be further evaluated for their applicability in Virginia.

F. That the state provide added financial and/or technical assistance in rural planning and assist local governments in obtaining federal funds for farmland preservation procedures.

Table 14. Land use: Why is agriculture land being lost.

Reasons	All farms		Cattle and Calves		Dairy		Hogs and Pigs		Tobacco		Peanuts		Grain		Other	
	urban	rural	urban	rural	urban	rural	urban	rural	urban	rural	urban	rural	urban	rural	urban	rural
Construction of highways	7	7	8	6	11	13	9	5	8	8	13	5	4	8	13	6
Development of housing units	14	14	16	12	17	19	9	8	7	19	13	8	13	16	13	15
Construction of industrial parks	6	6	5	5	4	12	9	5	6	3	13	5	4	7	12	3
Inheritance taxes	10	10	7	9	21	13	13	16	7	5	13	18	9	14	12	8
Real estate taxes	14	17	14	17	11	12	19	15	7	16	12	23	23	15	13	15
Low financial returns to farming	17	16	17	18	12	10	13	15	19	16	12	10	26	21	13	12
Purchase of farmland for non-farm uses	17	12	16	13	7	7	19	20	36	14	12	5	15	11	12	9
Lack of young farmers	15	18	17	20	17	14	9	16	10	19	12	26	6	8	12	32
Total	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100

Table 15. Ways state and local governments can aid in preserving agricultural land by percent.

Methods	All farms		Cattle and Calves		Dairy		Hogs and Pigs		Grain		Tobacco		Other	
	urban	rural	urban	rural	urban	rural	urban	rural	urban	rural	urban	rural	urban	rural
Ensure rational land planning	2	2	3	2	0	0	0	0	0	0	0	8	0	0
Slow down housing	13	12	14	12	19	14	15	0	0	17	11	26	0	0
Real estate tax relief	21	24	18	26	24	29	43	28	0	29	22	0	22	23
Improve farmers income	13	12	15	13	13	11	0	18	20	4	11	8	11	23
Inheritance or income tax	17	15	21	17	6	8	14	24	40	13	11	8	22	8
Helping young farmers enter farming	6	7	5	5	0	5	0	6	20	8	22	17	11	15
Enact measures to preserve agricultural land	16	16	15	14	19	22	28	12	20	17	0	17	22	23
Less government intervention	7	6	6	7	13	8	0	6	0	4	0	8	0	0
Other	3	2	3	1	6	3	0	0	0	4	0	8	0	0
Don't Know	2	4	0	3	0	0	0	6	0	4	12	0	12	8
Total	100	100	100	100	100	100	100	100	100	100	100	100	100	100

Laws and Regulations

In our society, there is a general acceptance of laws, regulations, and programs to deal with conflicts, provide relief, preserve values, provide incentives, and to protect the public. The primary concern is that laws, regulations or programs be properly assessed for all possible costs and benefits. It is quite apparent that in some instances, laws, regulations or programs, though dedicated to the common good, may be overly restrictive and increase the cost of production and the eventual cost to the consumer by more than the benefit to the public. It is imperative that these situations be avoided. In other instances, it is quite apparent that benefits accrue to the public to a much greater extent than to the opertor of the farm who is expected or required to comply. In such instances, implementation of such programs should be at public expense.

This section considers those laws and regulations which appear to have the most sigificant effects on the profitability of agriculture and forestry in Virginia. Specific areas of concern are:

- Resource management.
- Waste management .
- Pollution control.
- Management of pesticides, drugs, and hazardous materials and pest control.
- Labor.
- Other.

More detail on the laws and regulations in each of these areas of concern is shown in Appendix C.

Resource Management.

A number of laws relating to management of agricultural and forestry resources were found to have as their objective the conservation and development of these resources. Among these were:

- Coastal Resources Management, which has resulted in the Secretary of Commerce and Resources being given responsibility for coordinating coastal resources management and determining the need for legislation.

- The Resource Conservation Act, is for the purpose of protecting and enhancing land, water and related resources for sustained use; strengthening technical support for problem solving; and increasing public participation in conservation development. Efforts authorized by this act would result in a National Soil and Water Conservation Program.

- The Forest and Range Land Renewable Resources Planning Act directs the Forest Service to periodically assess the supplies and demands on forest resources and to make long-range plans for forest resource management.

- Forest Management Incentive Program, including the Federal Incentives Program, Agricultural Conservation Program and Reforestration of Timberlands program, provides assistance and incentives for forest land owners to practice good forest management.

- The Best Management Practices Program, found in both Federal and state laws, has the objective of determining those management practices or combination of practices to be the most effective and practicable means of preventing or reducing the amount of pollution generated by non-point sources.

- The Agricultural Foreign Investment Disclosure Act provides a means of obtaining information on the extent of foreign investments in agricultural resources. Informtion obtained would be reviewed and analyzed to ascertain whether special procedures pertaining to foreign ownership of agricultural land should be legislated.

Recommendations

Since many of the laws relating to resource management have as their objective the development of programs to protect, conserve and develop our agricultural and forestry resources, it is essential that governmental agencies involved and the industry of agriculture seek to avoid conflicts of objectives and provide adequate incentives for these programs to accomplish their objective for the public good. It is recommended:

A. That agencies charged with the implementation of programs developed in response to the several resource management acts increase their efforts to reach the objectives of these programs.

B. That the General Assembly and the Congress increase funding for:

1. Technical support of these programs.

2. Financial incentives where the benefits accrue to society at large and that these incentives be made uniform between programs with the same objectives.

C. That continued support be given the voluntary use of the Best Management Practices program for the control of non-point source pollution.

D. That proposed changes in water legislation be evaluated in terms of their potential impact on farm irrigation.

Waste Management.

The increasing volume of sludge and liquid effluent from both human and animal waste treatment systems is creating increasingly difficult disposal problems. While land applications of these waste products can be beneficial to agriculture and forestry by providing nutrients, trace metals, pH adjustment, or soil building, the fact that these wastes may contain substances that are hazardous to human and animal health make environmental regulations necessary to control methods of disposal. Hopefully, scientists and waste management system operators can develop methods of disposal of these wastes which would preserve the benefits of recycling but at the same time provide adequate protection for human and animal health.

Recommendations

With regard to waste management, it is recommended:

A. That laws prohibiting the disposition of sewerage sludge or effluent on agricultural land without an approved disposal plan, including analysis of the content, be implemented at the earliest possible moment.

B. That a periodic analysis be required of the sludge content to detect changes that would dictate reduction or elimination of the land application practice.

Pollution Control.

Laws relating to pollution control generally have as their objective the maintenance of clean air, clean water, and protection of the food supply from hazardous residues caused by the application of pesticides and herbicides in the production and processing of food. As related to agriculture and forestry:

– The Clean Air Act, administered by the State Air Pollution Control Board, prescribes regulations concerning open burning. These regulations permit farmers and foresters to continue to use burning to destroy unwanted vegetation, orchard prunings, controlled forest burning, prevention of frost damage, and similar burning operations.

– The Clean Water Act, administered by the State Water Control Board, has regulations requiring non-discharge certificates for livestock and poultry facilities that collect, store, and handle animal wastes. These are not required for small operations where animals are not confined and have

sufficient range. Certificates are also required for log storage, sorting or processing when state waters may be affected. The objective of this effort is the improvement of water quality, soil conservation, and recycling of nutrients.

Recommendations

With regard to pollution control, it is recommended:

A. That in the administration of the Clean Air Act and the Clean Water Act, the objectives of these statutes be accomplished with the least possible restrictions on agricultural and forestry production.

B. That a separate section applicable to animal waste be established under the Clean Water Act rather than treating animal waste under the "other waste" category.

Management of Pesticides, Drugs and Hazardous Materials and Pest Control.

- The Virginia Pesticide Law, administered by the Virginia Department of Agriculture and Consumer Services, parallels and supports Federal regulations regarding pesticides. State law requires the registration of each pesticide product offered for sale in the state. The state maintains the sole responsibility for certification of applicators of restricted use pesticides under a plan approved by EPA to register pesticide products, not federally registered, to meet special local needs. State personnel have the primary responsibility for enforcement of the Federal Act as well as enforcement of the Virginia Law.

- The Virginia Animal remedies Law, administered by Virginia Department of Agriculture and Consumer Services, is a counterpart to the Federal Food, Drug and Cosmetic Act and provides authority for the regulation of drugs in animal feeds and over-the-counter animal drugs. Each such product is registered and is subject to inspection as it relates to active ingredients, therapeutic claims and directions for safe and effective use.

- The Hazardous Household Substance Law, administered by Virginia Department of Agriculture and Consumer Services, provides for the precautionary labeling of a variety of products used in and around the household when any ingredient of the product is toxic, corrosive, an irritant, a strong sensitizer, is flammable or generates pressure if the product may cause substantial personal injury or illness as a result of any customary handling or use. The Law applies to toys and other articles intended for use by children if the article presents an electrical, mechanical or thermal hazard. Authority is provided to ban hazardous substances when such articles have been banned by the Federal Consumer Product Safety Commission or are declared to be banned by the State Board of Agriculture and Consumer Services after public hearings.

- The Virginia Toxic Substances Information Act administered by the State Health Department requires all commercial establishments manufacturing or using a chemical substance or compound to file an inventory report on materials used in the manufacture and production of products. This information is cataloged and is intended as a source of information to all state agencies and other interested parties who have need or interest in where chemical materials are used in Virginia. Additionally, the State Board of Health has authority to classify the more toxic products and manufacturers and users of any Class 1 toxic substances must report additional essential information to the State Health Department.

- Forestry management has been seriously affected by environmental health regulations which prohibit use of herbicide 2-4-5-T as an agent for inhibiting growth of undesirable undergrowth when preparing sites for reforestation. The ban on the use of this chemical is halting the annual spray release of an estimated 20,000 acres of existing stands of pines and will result in an annual loss of $1.5 million in reduced growth, product value and services generated. Forestry scientists face a strong challenge in developing management practices that can match the economy and convenience of the use of this herbicide.

- The Pest Control Laws of Virginia must be adequate to protect the agricultural and forest industries of the State against infestation by newly introduced or not widespread pests within

the State. These laws should provide clear and indisputable agency authority, provide adequate right of entry, and provide sufficient enforcement authority to protect these industries.

Recommendations

With regard to management of pesticides, drugs, and hazardous materials and pest control, it is recommended:

A. That a uniform benefit/risk assessment policy be developed in relation to the use of additives, drugs and pesticides. In this connection, the "Dulaney Amendment" should be amended to permit reasonable tolerances when scientific evidence indicates such tolerances would not be harmful to human health.

B. That the Food and Drug Administration move with greater speed in adopting or establishing guidelines and tolerances for foods and all alternatives be considered before removing food items from the market.

C. That an effective means be developed to prevent the misuse of chemicals in agricultural production.

D. That the General Assembly amend plant pest laws to assure adequate protection for our agricultural and forest industries.

Labor Laws and Regulations.

Five federal laws, three state laws, and a score of regulations and programs are applicable to workers in agriculture and forestry. While these laws have been written to protect the safety and health of workers, many of the regulations fail to take into account the situation existing on most farms and are overly restrictive. These regulations are often voluminous and written in legalistic languages that are difficult for laymen to read and understand. If fully implemented, they would seriously impede the productive effort of farm workers and would add little to the safety and health of the worker. While it is essential that educational programs be developed to assure that farmers and foresters have a working knowledge of agricultural labor laws and regulations, it is also incumbent on administrators and legislators to recognize farm and forestry conditions in the development of laws and regulations so that reasonable measures can be taken to protect the safety and health of the worker without adversely affecting his productive ability.

Recommendations

With regard to labor laws and regulations, it is recommended:

A. That Virginia Ploytechnic Institute and State University devise educational programs to assure that farmers and foresters have a working knowledge of agricultural labor laws and regulations.

B. That equal protection be provided for agricultural employers in regulations relating to agricultural and forestry labor laws.

C. That regulations relating to these laws recognize the working conditions on farms and in the forest and endeavor to provide for the safety and health needs of the worker without impeding his productivity.

Other Laws.

In this study of laws and regulations affecting agriculture and forestry, two other statutes were found that appeared to be deficient. They are:

– The statute providing compensation to the owner of livestock or poultry killed or impaired by dogs. This statue provides that the owner shall receive a fair market value for such livestock or poultry. Apparently there is considerable variation from county to county in the determination of

a fair market value, and before a claim is paid, the claimant must submit evidence that legal remedies have been exhausted against the owner of the dog.

– Virginia fencing laws are out-dated and need revision in three major respects:

- The present non-uniform application of the state statute from county to county.

- Uncertainty of the code dealing with division fences.

- The lack of clarity in the definition of a lawful fence in both intent and control.

Recommendations

A. With regard to the statutes providing compensation to the owner of livestock or poultry killed or impaired by dogs, it is recommended that subcommittees from the Courts of Justice Committees of the Senate and House study these laws and make recommendations for legislative changes that would overcome these deficiencies.

B. With regard to fencing laws, it is recommended that subcommittees of the Courts of Justice Committees of the Senate and House study these laws to determine where they should be amended so that they can be administered more uniformly.

The Unique Role and Impact of Virginia's Land Grant Universities

The agricultural program of Virginia's Land Grant Universities (Virginia Polytechnic Institute and State University and Virginia State University) are unique among all institutions of higher education in Virginia because they are the only ones providing comprehensive programs of teaching, research, and extension in agriculture and forestry. There are, therefore, no alternative institutions within the state to satisfy the educational needs of agriculture. The success of these programs impacts on all citizens of the Commonwealth.

Their mission is broad, clearly defined, and centered in the College of Agriculture in each of the land grant universities. Each college has a long history of accomplishments and is dedicated to the philosophy that it is about those pursuits of value to people. They deal in knowledge–

the generation of knowledge through research;

the dissemination of knowledge through teaching;

the application of knowledge through extension

– for the ultimate benefit of people. That means that they place high priorities on students and their total educational development; on the generation and application of information useful to the broad industry of agriculture and to the public; and, because of their close contact with the people and industries of Virginia, on programs which are relevant to Virginia.

Virginia Polytechnic Institute and State University was established under the Morrill Land-Grant Act of 1862, and Virginia State by the Land Grant College Act of 1890. Under these acts, the individual states were granted the legal and financial mechanism to establish colleges "to promote the liberal and practical education of the industrial classes in the several pursuits and professions in life"; and "to teach such branches of learning as are related to agriculture and the mechnics arts" on an egalitarian basis. Subsequent major acts of Congress extended the imperatives of the land-grant college to agricultural research (Hatch, 1887), and Extension (Smith-Lever, 1914).

The importance of American agriculture to this nation's economy, standard of living, international trade; to world peace and understanding; and, to the protection and preservation of the environment and our natural resources are recognized as the strongest justification possible for the continuation and further strengthening of the industry of agriculture in the United States through land grant universities.

The efficiency of American agriculture is unsurpassed and is the major contributor to this nation's exports. Agriculture continues to be the largest industry in the United States. It is the largest single employer and the biggest buyer, seller, and borrower in the United States. One of the major reasons for the productivity and efficiency of American agriculture is the impact of the Land-Grant Universities' Colleges of Agriculture through research, teaching, extension, and public service. It is absolutely essential that the production capacity be expanded and the efficiency of the industry be improved through research and educational programs of these public institutions.

Recommendations

In order that the contributions of these institutions to our state and nation may be made even more significant, it is recommended that:

– The Governor and the General Assembly request Virginia Polytechnic Institute and State University in cooperation with Virginia State University and others to formulate and submit to the State Council on Higher Education in Virginia a comprehensive higher educational plan to meet the many and broad educational needs of the industry of agriculture and the closely related businesses and services in the Commonwealth. This plan should address:

- The total needs of higher education for agriculture in Virginia. It should specify ways to intensify and improve the quality and relevance of higher education in Virginia without costly and unnecessary proliferation and duplication of programs. The Land Grant Universities shall seek appropriate input from the industry of agriculture and appropriate organizations and agencies, both State and Federal, in the formulation of this plan.

- The full range of educational programs in agriculture and forestry, including sub-baccalaureate, baccalaureate, masters, and Ph.D. degrees. Specifically, the plan shall consider a two-year agricultural program similar to successful programs at other Land Grant Universities such as North Carolina State, Michigan State and Ohio State. Additionally, the plan should consider offering a Master of Agriculture Degree to be offered off-campus.

[1] This assumes the use of current farm production practices and stability in U.S. per capita food consumption. New technologies on the horizon in terms of faster gains in livestock, multiple livestock births, and higher yielding plants will tend to shift production outputs to higher efficiency levels. This may cause the future demand for additional production land to be somewhat lowered.

[2] Quance, Leroy, *et al*"Adjustment Potential in U.S. agriculture," Vol. 1, Economics, Statistics, and Cooperative Service, U.S. Department of Agriculture, Washington, D.C.

APPENDIX A

Trends in Production Agriculture

Changes in the farm production sector of Virginia's industry of agriculture since 1967 are highlighted as follows:

--Number of farms declined 25 percent, acres on farms declined 20 percent while total acres harvested actually increased slightly.

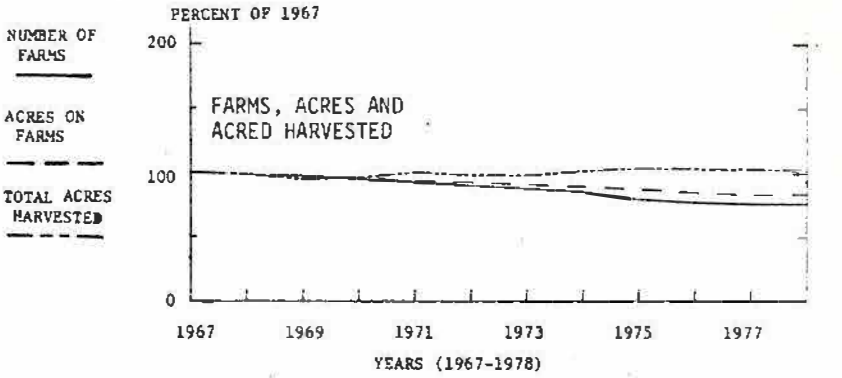
--Gross farm income increased 142 percent and net farm income increased 138 percent before adjustment for inflation. Inflation reduced the increase in net income to 18 percent.

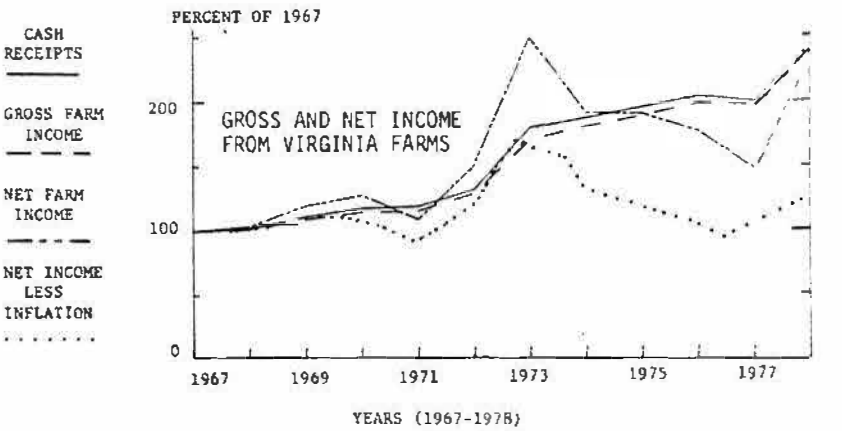
--Total farm assets and proprietor's equity increased 106 percent and farm liabilities increased 112 percent while the ratio of farm debts to farm assets remained relatively stable.

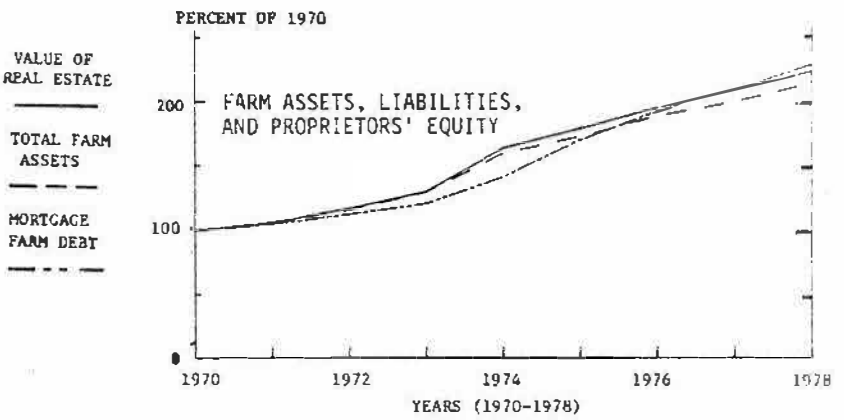
--The biggest gain in production agriculture has been the increasing value of farmland. Total farm real estate (land and buildings) increased 120 percent while farm mortgage debt increased 100 percent.

The accompanying charts were derived by establishing the calendar year 1967 as the baseline for all farm production, farm value of commodities, and farm value minus inflation. Changes in value of each commodity produced or marketed, value of each commodity produced or marketed and value minus inflation were calculated by dividing these data on each calendar year by similar data for the calendar year 1967. Value minus inflation was calculated by dividing the commodity value each year by the official consumer price index for the same year.

Chart 1. VIRGINIA FARMS, ACRES, ASSETS AND LIABILITIES







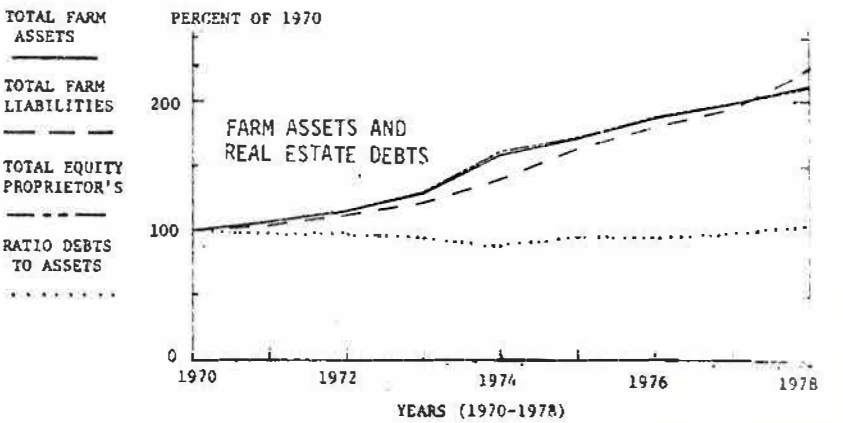


Chart 2. LIVESTOCK AND POULTRY INDUSTRIES

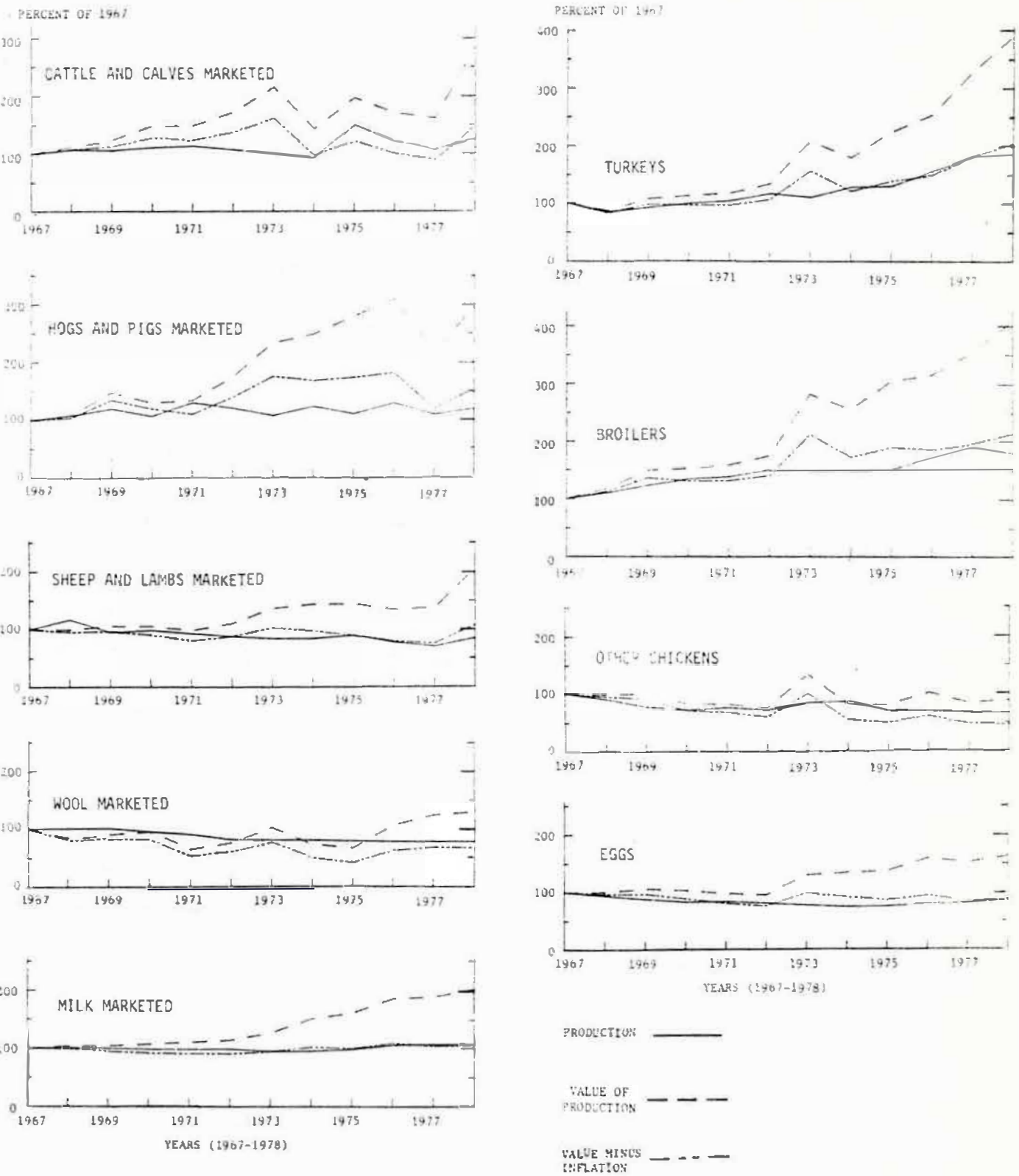


Chart 3. FIELD CROPS

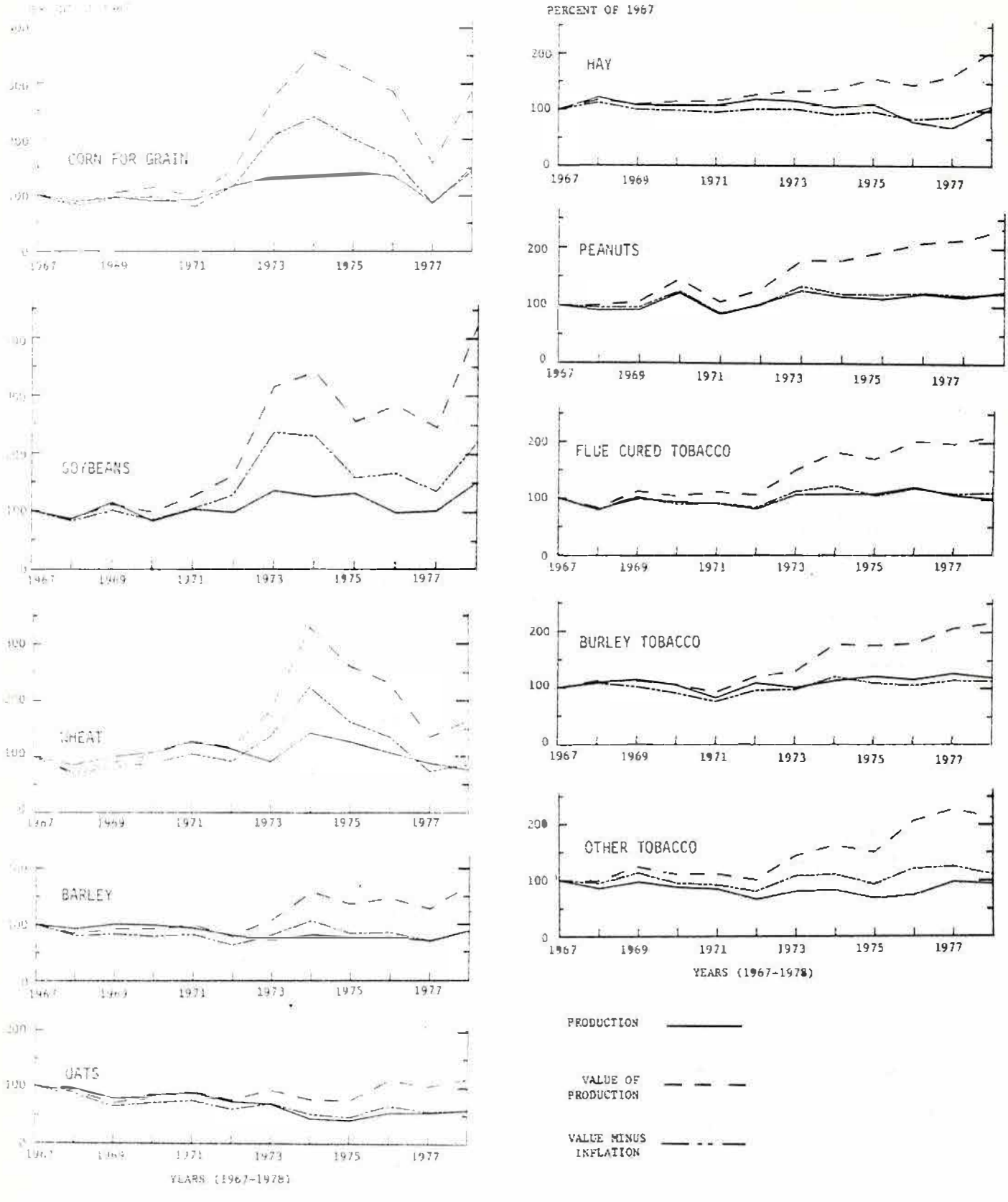


Chart 4. FRUITS, VEGETABLES, NURSERY AND GREEN HOUSE PRODUCTS

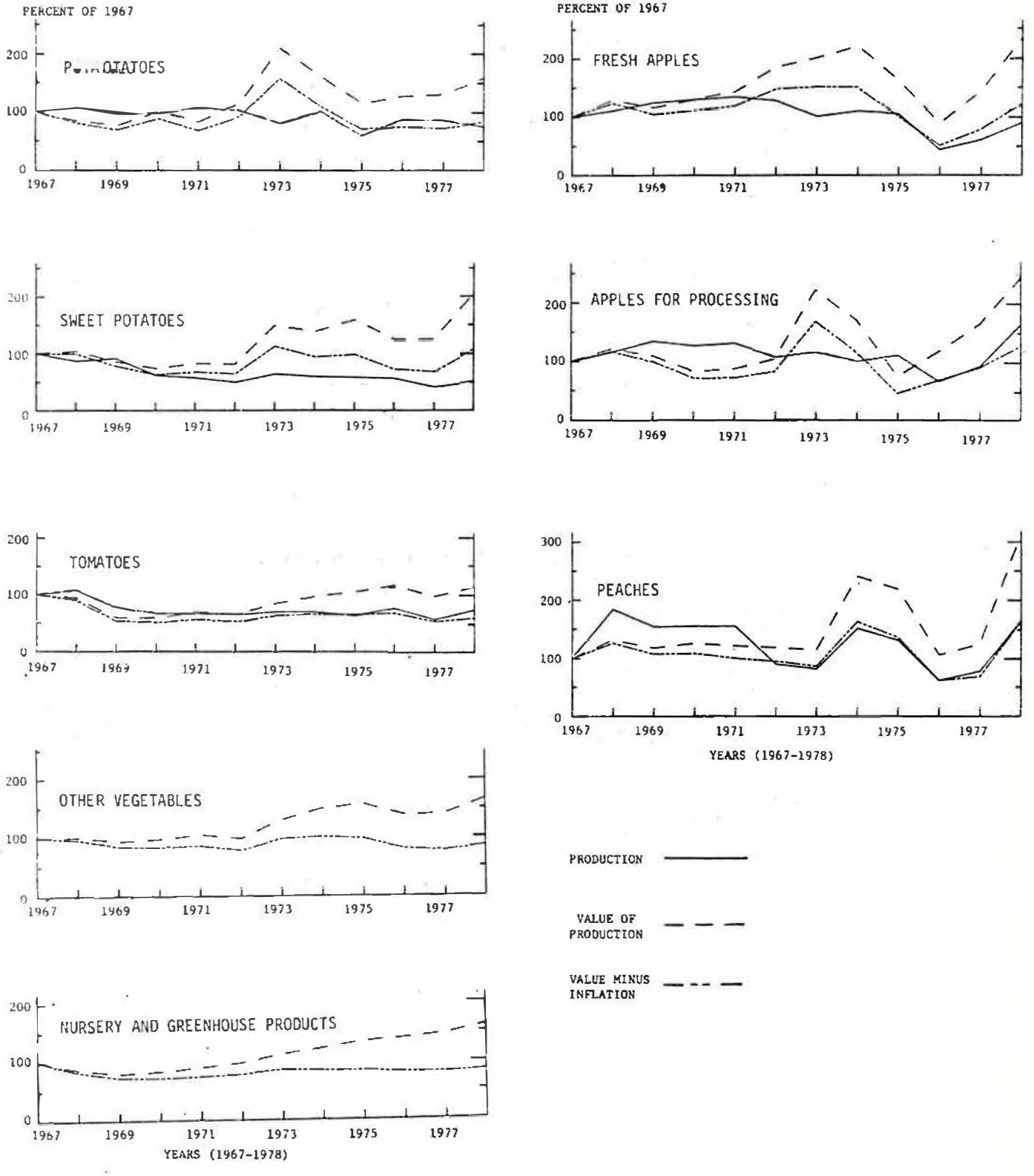
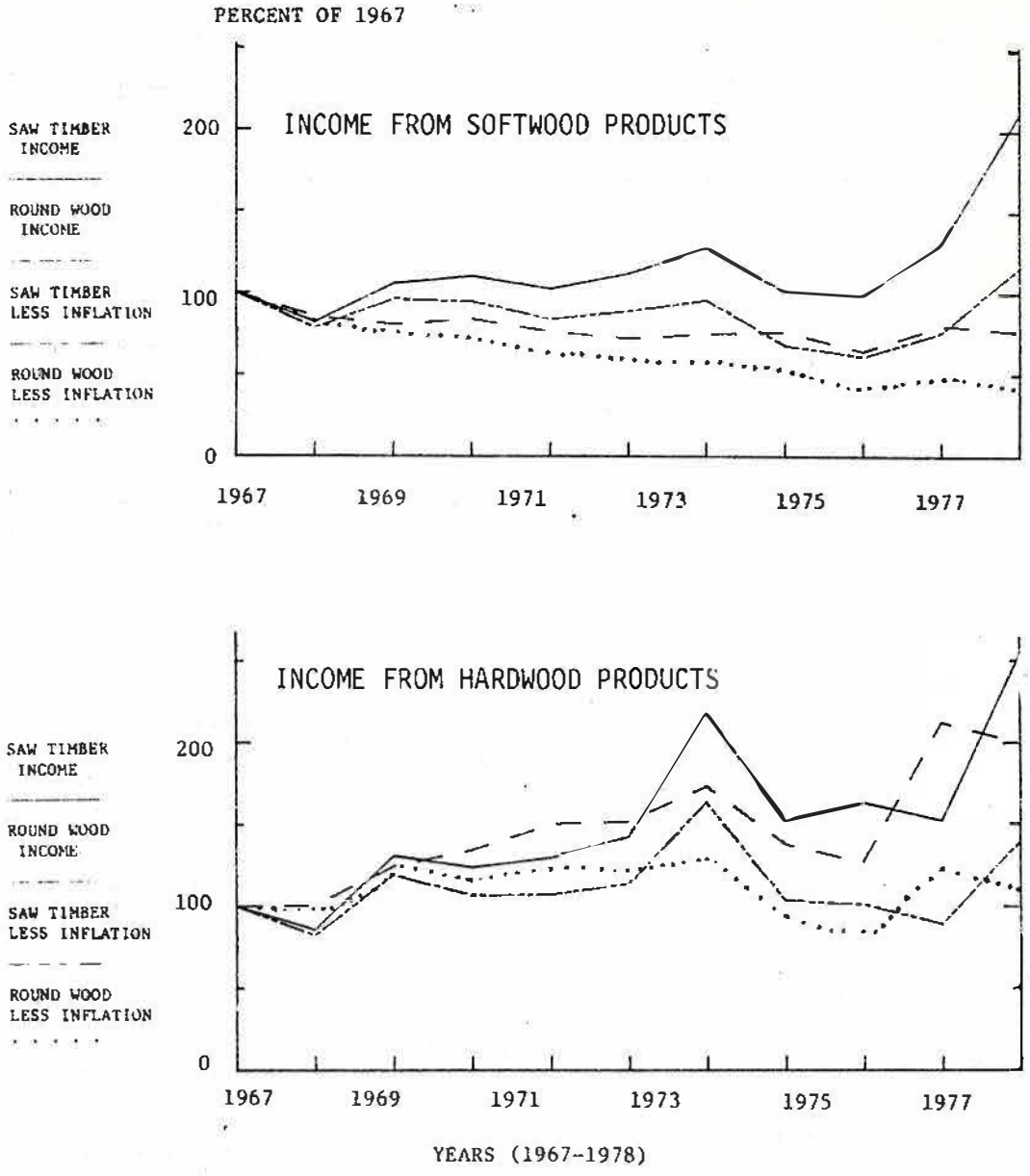


Chart 5. FOREST INDUSTRIES



APPENDIX B

Major Federal and State Laws, Policies, and Programs that Relate to the Preservation of Agricultural and Forestal Land

Major Federal Laws, Policies and Programs

1. USDA Policy Paper (June 1976) entitled Statement of Prime Farmland, Range and Forestland urged that "all agencies adopt the policy that federal activities that take prime agricultural land should be initiated only when there are no suitable alternative sites and when the action is in response to overriding public needs." This statement also established specific policy guidelines in regard to prime land including advocating the protection of prime lands.

2. USDA Statement on Land Use Policy (October 30, 1978):

   – directs agencies under USDA to avoid proposing or assisting actions that could reduce the amount of land available for food and fiber production.

   – directs these agencies to increase aid to state and local governments in efforts to retain important wetlands and farm, forest and range lands.

   – establishes a policy of interceding in decision making by other federal agencies where conversion of important agricultural lands is anticipated by these agency programs.

3. The Land and Water Conservation Fund, US Department of Interior, has a policy that projects causing an irreversible loss of prime and unique farmlands will not be assisted under the Land and Water Conservation Fund program.

4. Environmental Protection Agency Policy Guidelines require:

   – that Federal projects must consider their impact on agricultural land.

   – that nuclear site developments be located on lands that do not encompass more than two percent prime agricultural land.

   – that "Best Management Practices" be included in any funding projects under the Section "208" planning proposals.

   – that land resource environmental impact statements be prepared on any proposals for Federal funding.

5. Federal Coastal Zone Management Act provides funds for evaluation and planning purposes in the coastal zone areas of the nation. These funds may be used for the preservation of land and marine resources.

6. Resources Conservation Act of 1977 (PL 95-192) provides USDA with the task of continually appraising the nation's soil, water, and related resources with the intent to insure that national programs conserve, protect and enhance these resources. This program must be consistent with the roles and program responsibilities of other federal agencies and state and local governments in this area.

7. Environmental Protection Agency Policy (1978), ordered EPA regional heads and program chiefs to consider the effects of their rulings and decisions on farmland loss and take alternative courses of action, if possible, when there is a possibility of negative effects.

8. Federal Foreign Agricultural Disclosure Act of 1978 requires that foreign persons acquiring American agricultural land report such acquisitions to the Secretary of Agriculture.

9. Important Farmlands Inventory. The Soil Conservation Service of USDA began an inventory of important farmlands in 1975. At first only prime and unique farmlands were defined. However, the program has been expanded to include other farmlands of local and statewide importance. Some 1200 counties in the U.S. have been selected as having the most urgent need for the important farmlands inventory. These counties have significant acreages of prime farmland and are currently under pressure of urbanization and other land-use changes. The target date for completing these selected counties is 1981 and the nationwide inventory is expected to be finished in 1986.

10. Council on Environmental Quality Memorandum for Heads of Agencies (August 30, 1976) notified all federal agencies that environmental impact statements should consider carefully the effect on proposed projects on prime and unique farmlands.

11. Economic Development Administration action requires all applicants for sewer and water grants to obtain certification from the state USDA Land Use Committee that the proposed action will not unnecessarily remove prime agricultural land from production.

12. H.R. 2551 (introduced March 1, 1979) proposed to establish:

    – An internal federal policy concerning protection of certain agricultural land.

    – A Study Committee on the Protection of Agricultural Land.

    – A demonstration program relating to methods of protecting certain agricultural land from being used for nonagricultural purposes.

13. S. 795 (introduced March 27, 1979) proposes to:

    – Establish a federal policy concerning protection of certain agricultural land.

    – Provide for a land review study by the Secretary of Agriculture.

    – Establish a research and pilot project program relating to methods of protecting certain agricultural land from being used for nonagricultural purposes.

VARIOUS LAWS AND REGULATIONS RELATED TO PRESERVING AGRICULTURAL AND FORESTRY LAND, BY STATES

Type of law or regulation	Analysis
1. Use Value Assessment Arizona, Arkansas, Colorado, Connecticut, Delaware, Florida, Idaho, Indiana, Iowa, Louisiana, Missouri, New Mexico, North Dakota, Oklahoma, South Dakota, West Virginia, Wyoming	This program has not been very successful because penalties are not assessed when land is changed from a qualifying to a non-qualifying use.
2. Use Value Assessment with Deferred Taxation Alabama, Alaska, Illinois, Kansas, Kentucky, Maine, Maryland, Massachusetts, Minnesota, Montana, Nebraska, Virginia, Washington, North Carolina, Nevada, New Jersey, New York, Ohio, Oregon, Pennsylvania, Rhode Island, South Carolina, Tennessee, Utah, Texas, Vermont	Roll-back taxes or other penalties are applied when land is converted to other uses. Some eligibility requirements include: stating land was in a particular use; a minimum income; providing a history of farm use; or having a minimum length of land tenure within the family. Program implementation varies from local to statewide with some requirements voluntary and others automatic. Roll-back taxes are collected retroactively from two to ten years. Some states also collect interest on deferred taxes while others attach penalties based on market value of the converted property. The deferred tax program in Virginia imposes a penalty if the use is changed. However, it does not address the issue of urban vs. rural conflicts which may result because of location. These locational factors may force conversion to non-qualifying uses just as readily as assessments which are incompatible with a particular use.
3. Use Value Assessment with Restrictive Agreements California, Hawaii, Michigan, New Hampshire, Pennsylvania, Wisconsin, Vermont, Florida (1 county)	This is a combination of many types of land-use controls plus a legally enforceable contract between the landowner and the administrative agency. This type of agreement inhibits the development of land for a predetermined period of time.

Type of law or regulation	Analysis
4. Circuit Breaker State Income Tax Credits Michigan Wisconsin	In Michigan, farmers may enter into a contractual agreement to keep their land in agriculture for 10 years. As compensation for surrender of development rights, the farmer receives a tax credit against his/her state income tax liability. The credit is equal to the amount by which property taxes exceed 7 percent of the household income. Wisconsin's law gives a maximum credit of $2,600. The credits are calculated by a detailed formula which gives higher credits to those with higher taxes and lower incomes. Incomes over $35,000 are not eligible. Since the beginning of the program over 800,000 acres of agricultural land have been signed up (42% of the land in the program is located in urban areas). This method provides an excellent opportunity for communities to preserve agricultural land. However, the strong penalty for breaking the agreement ($1,000 tax credit allowed per year for 20 years would yield a payment of $39,000 where compound interest from the time the credit was given was charged) might keep individuals from entering the program. On the other hand, if a contract is allowed to expire at the end of twenty years and then the land is developed, there would be a payment of only $21,000 and this situation could lead farsighted speculators to take advantage of the programs.
5. Agricultural Districts New York Virginia	Virginia's law is almost identical to New York's law. Districts are created by the local governing bodies for a specified period of time. Powers of government are restrained. Landowners enjoy certain benefits but are restricted to some extent as to the uses which can be made of qualifying property. The districts in New York are well distributed throughout the state and semi-urban regions have shown the greatest response to this form of agricultural zoning. The success can basically be attributed to the voluntary nature of the program, flexibility, and the fact that local input is required. As of October 10, 1979, 15 districts totalling 36,299 acres have been formed in Virginia. Also, about 30 additional districts are being considered at the present time.
6. Exclusive Agricultural Zoning Hawaii Oregon Wisconsin	Zoning has been the traditional means of land-use control in most states especially in urban situations. However, it is seldom considered as a serious method of rural land-use control. Hawaii has enacted a state land use and zoning law which has four broad categories: zones with land for expansion; rural zones contain a mix of small farms and residential; agricultural zones contain those lands with a high capacity for intensive agriculture; and conservation zones land contain watersheds and forests. Farmers who own lands in an agricultural zone can dedicate their land to agricultural use for 10 years in return for use value assessment. In 1973, the time period was extended to 20 years.

Type of law or regulation	Analysis
	Oregon's use of zoning dates to passage of the Green Belt Law in 1961 which established Exclusive Farm Use Zones. To compensate a landowner for being in the program the following incentives are provided: only compatible uses are allowed, subdivisions of more than 10 acres must not be in conflict with the intent of the Law, restrictive local ordinances are prohibited; no minimum income to qualify for use assessment; no previous farming history required to qualify for use assessment, no tax penalty when land is removed from zone as a result of government action, exemption of qualified land from special district assessments and farm is valued at use value for inheritance tax purposes.
7. Purchase and Leasing of Development Rights Connecticut Massachusetts Maine New Jersey Maryland New York	Areas that are under particularly heavy stress from suburbanization are finding that use value taxation, deferred taxation or restrictive agreements may not be too effective. Some states have instituted a program whereby the community will purchase the development rights of agricultural lands as a means of preserving open space that they feel is necessary to retain the present character of the community. The landowner is paid for the developmental valve of his property and he continues to operate as he has in the past. Leasing of development rights involves the same principle except the community rents the development rights for a specified period of time. The 1978 Connecticut legislature passed a bill for a pilot program to solicit from owners of agricultural land offers to sell their development rights. It is too early to judge the effectiveness of this program. In 1974, the Suffolk County legislature, New York, authorized the expenditure of public funds for the purchase of development rights. The program is voluntary; landowners submit sealed offers; the county evaluates the offers, makes an appraisal, and makes an offer to the seller. The first and only round of bidding was completed in 1975. In 1978, the sale of 21 million dollars in bonds was authorized to purchase rights on selected properties. The first contract was signed in 1977. When the 21 million is exhausted, the county expects to have 3900 acres in the program. This program seems to be working in this county since it reduces the tax burden as well as provides the necessary environment for continued capital improvement. The New Jersey program has not been successful due to insufficient funding. Funding these programs can be very difficult in terms of dollar amounts and methods of financing.
8. Transfer of Development Rights Alaska Maryland New Jersey New York	Plans are similar except for the state of Alaska. Local Planning Commissions divide their jurisdictions into districts and adopt comprehensive land use plans. The district is alloted a percentage of private land which can be developed in designated locations and assigned a number of development rights. Owners wishing to develop their land may request a transfer of development rights from one location to another location within the districts. This allows optional location of development with equal compensation to owners of land. Alaska's program is unique in that the government owns a major portion of the land which lends itself to this kind of program. Maryland's program is the most progressive and contains at least one advantage, i.e., the system is allowed to operate in the free market system where a willing buyer and a willing seller arrangement can take place. No government moneys are needed to finance the program.

Type of law or regulation	Analysis
9. Discretionary Easements New Hampshire	This will restrict the owners' right to subdivide development or otherwise change the use of such land during the easement period. Use value assessment applies to any land for which an easement is held. If the easement is maintained for the agreed upon period, there is no land-use change tax if the land is ultimately changed to a non-qualifying use. Penalties for release during the first half of the agreement is equal to 12 percent of the full value assessment of such land. For a release within the second half of the easement the penalty is 6 percent of the full value assessment.

10. Land Banking

Land banking is a concept that has no support in the lower 48 United States, but since it is a method of protecting agricultural land use in Canada and Alaska, it has been included in this report for information purposes only.

The Canadian province of Saskatchewan is presently operating a land banking program with goals of facilitating the transfer of family farms from one generation to the next and assisting those who wish to begin farming. Indirectly, the program has aided in maintaining rural communities and preserving prime agricultural land by creating an opportunity to farm for those who could not do it on their own.

The Saskatchewan Land Bank is empowered to:

(1) purchase farms from those who wish to retire
(2) transfer the family farm from generation to generation
(3) lease land to those with farming ability who wish to start farming
(4) lease land to those who require additional land to make a viable unit
(5) provide counseling and management assistance to those who are renting land
(6) provide improvement loans to farmers leasing Land Bank lands; and
(7) purchase, with lease-back option, all or part of the land from persons who wish to continue to farm but need to reduce their debt or free capital for the purpose of intensifying production.

Priorities for purchase are established in the law. When more land is offered to the land bank than it has the means of buying, land with the following characteristics can be purchased first:

(1) large tracts of land capable of supporting two or more operations
(2) parcels of land which constitute a full unit
(3) land of farmers who wish to retire and transfer their land to direct descendants
(4) property of persons wishing to sell land that can be used to establish or assist in the establishment of a viable farm unit; and
(5) property of persons having a need to sell the land and lack an available sale alternative.

The Land Bank purchases land at market value based on the cost of land of similar quality in the area. It then leases the land to qualified farmers for not less than 5 percent and not more than 6½ percent of the market value for a 10 year period. The lessee may purchase the land, plus improvements, after leasing the land for 5 years.

Alaska appears to be in a situation in which it is operating almost as if it were running a land banking program. Alaska already owns most of the agricultural land within its boundaries. By law, whenever it sells or leases agricultural land, it transfers only the right to use the land for agricultural purposes, and retains all other rights. So, in a sense, it is operating a de facto land bank. The results are acceptable to the state as they do not view the preservation of agricultural land a problem because of the control that is exercised over it.

MAJOR VIRGINIA LAWS AND REGULATIONS THAT RELATE TO THE PRESERVATION OF AGRICULTURAL AND FORESTRY LAND

Types of Laws and Regulations	Analysis
1. Article XI of the Constitution of Virginia states "... it shall be the policy of the Commonwealth to conserve, develop and utilize its natural resources, its public lands and its historical sites and buildings. Further, it shall be the Commonwealth's policy to protect its atmosphere, lands, and waters for pollution, impairment or destruction, for the benefit, enjoyment, and general welfare of the people of the Commonwealth.	This policy provides overall basic guidelines to the Virginia Executive Branch and to all State agencies. This was effective in 1971.
2. Section 58-769.4 of the Code of Virginia states "... an expanding population and reduction in the quantity and quality of real estate devoted to agricultural, horticultural, forest and open space uses make the preservation of such real estate a matter vital to the public interest. It is, therefore, in public interest (a) to encourage the preservation and proper use of such real estate in order to assure a readily available source of agricultural, horticultural and forest products and of open spaces within reach of concentrations of population, to conserve natural resources in forms which will prevent erosion, to protect safe and adequate water supplies, to preserve scenic natural beauty and open spaces and to promote proper land-use planning and the orderly development of real estate for the accommodation of an expanding population; and (b) to promote balanced economy and ameliorate pressures which force the conservation of such real estate to more intensive uses and which are attributable in part to the assessment of such real estate at values incompatible with its use and preservation for agricultural, horticultural, forest or open space purposes." This section is the Declaration of Policy in the Land Use Assessment Law.	Although this section has no direct implications of law and regulations, it has served a very useful purpose when communicating to the general public, organizations, and governmental agencies. This section represented the first Virginia legislation to state that the preservation of agricultural and forestry land is a matter vital to the public interest. This became effective July, 1972, and is a part of the Virginia Land Use Assessment Law.
3. Chapter 11 - Planning, subdivision of land and zoning; Articles 1-9; Sections 15.1-427 through 15.1-503.1 of the Code of Virginia deal with comprehensive planning, subdivisions and zoning by regional and local governments. Section 15.1-489. Purpose of zoning ordinances.--Zoning ordinances shall be for the general purpose of promoting the health, safety or general welfare of the public and of future accomplishing the objectives of Section 15.1-427. To these ends, such ordinances shall be designed (1) to provide for adequate light, air, convenience of access, and safety from fire, flood and other	Comprehensive planning and zoning continues to be one of the best tools to preserve agricultural and forestry land provided the comprehensive plans and zoning restrict agricultural and forestry lands for those uses. Out of the 95 counties and 41 cities in the State: --76 counties have a comprehensive plan --39 cities have a comprehensive plan

Types of Laws and Regulations

dangers; (2) to reduce or prevent congestion in the public streets; (3) to facilitate the creation of a convenient, attractive and harmonious community; (4) to expedite the provision of adequate police and fire protection, disaster evaluation, civil defense, transportation, water, sewerage, flood protection, schools, parks, forests, playgrounds, recreational facilities, airports and other public requirements; (5) to protect against destruction of or encroachment upon historic areas; (6) to protect against one or more of the following: overcrowding of land, undue density of population in relation to the community facilities existing or available, obstruction of light and air, danger and congestion in travel and transportation or loss of life, health, or property from fire, flood, panic or other dangers; and (7) to encourage economic development activities that provide desirable employment and enlarge the tax base. (Code 1950, Section 15-821; Code 1950 (Suppl.), Section 15-968.3; 1962, c. 407; 1966, c. 344; 1968, c. 407.)

Section 15.1-446.1 of the Code of Virginia requires local planning commissions to prepare and recommend a comprehensive plan for the physical development of the territory within its jurisdiction and that every governing body in the State shall adopt a comprehensive plan for the territory under its jurisdiction by July 1, 1980. The comprehensive plan may designate: areas for public and private development and use; a comprehensive system of transportation facilities; a system of community services; and areas of historical significance, renewal or development projects.

Section 15.1-1406 of the Code of Virginia requires each planning district commission to prepare a comprehensive plan for the guidance and development of the district. Upon approval of the district comprehensive plan by the governing bodies of a majority of the local governmental subdivisions, the comprehensive plan shall be effective with respect to all action of the planning district commission. The plan shall not become effective with respect to the action of the governing body of any governmental subdivision within the district until adopted by the governing body of such governmental subdivision.

Analysis

--94 counties have subdivision ordinances
--41 cities have subdivision ordinances

--60 counties have zoning ordinances
--41 cities have zoning ordinances

There are approximately 15 counties that will be adopting another ordinance soon.

Types of Laws and Regulations	Analysis
4. The Land Use Assessment Law, Chapter 15, Title 58, Article 1.1, of the Code of Virginia authorizes any county, city or town in the Commonwealth which has adopted a land-use plan to adopt an ordinance to provide for the assessment and taxation of real estate classified as devoted to agricultural, horticultural, forest or open space use to be assessed and taxed according to use value rather than fair market value so long as the property remains in such use.	This law provides a mechanism for localities to tax agricultural and forestry land on its use value. Forty-seven states have similar legislation, and 66 localities in Virginia have adopted Land-Use Assessment ordinances as of October 27, 1979.
5. Section 15.1-1506. "Agricultural and Forestal Districts Act" ...to provide a means by which agricultural and forestal land may be protected and enhanced as a viable segment of the State's economy and as an economic and environmental resource of major importance.	This provides a mechanism for land owners and local governments to voluntarily create by local ordinances agricultural and forestry zoning for periods of 4 to 8 years. Sixteen Agricultural and Forestal Districts have been created in Virginia consisting of approximately 37,750 acres, as of October 27, 1979. Approximately 30 to 35 districts are in the planning/approval process with a range of 540 acres to 18,000 acres.
6. The Virginia Reforestation of Timberlands Act of 1973 (Section 10-90.26) provides an incentive program for reforesting land which has assisted in reversing the decline in forest land acreage in Virginia.	This provides financial assistance for reforesting land. Virginia continues reforestation at a rate of 80,000 to 100,000 acres per year.
7. Virginia Soil Survey and Mapping Master Plan to accelerate the Virginia portion of the National Cooperative Soil Survey; to complete the inventory of Virginia's soil resource by 1990; and to make necessary coordination, therefor, was adopted by the 1972 General Assembly (Section 21-5.2).	Soil survey and mapping is definitely needed to identify productive agricultural and forestry land and to assist in comprehensive planning. As of October 27, 1979, soil surveys have been completed in 34 localities and soil surveys are in progress in 22 counties.
8. The Soil Erosion and Sediment Control Law (Section 21-89.5) requires that each locality develop a local soil erosion and sediment control program or else enforce a program to be established by Soil and Water Conservation Districts. This was enacted by the 1973 General Assembly.	This provides a conservation tool to preserve lands devoted to agriculture and forestry. Also Soil Erosion and Sediment Control ordinances have been adopted in all localities.
9. Soil Conservation Districts Law (Section 21-1 to 21-112.21) provides a legal framework for the programs of the state's 42 soil and water conservation districts. In declaration of policy (Section 21-2.(a), the law states, "That the lands of the State of Virginia are among the basic assets of the State, and that the preservation of these lands is necessary to protect and promote the health, safety, and general welfare of its people..." Article 6 of the law provides SWCD directors with the power "to formulate regulations governing the use of lands within the district in the interest of conserving soil and water resources and preventing and controlling soil erosion."	No district has established this authority through the required referendum.

Types of Laws and Regulations	Analysis
19. Virginia Foreign Agricultural Investment Disclosure Act requires all foreign investments in agricultural land to be reported to the Commissioner of Agriculture and Consumer Services.	This allows a monitoring program of agricultural foreign investments. 88 tracts of land totaling 59,605.96 acres located in 29 localities as of October 1, 1979, have been reported.

APPENDIX C

Major Laws, Regulations and Programs That Impact Upon Agriculture and Forestry

Land Application of Sludge, Liquid Effluent and Other Waste

Federal Laws:

1. The Resource Conservation and Recovery Act of 1976 (PL94-580)

2. The Clean Water Act of 1977 (PL95-217)

3. Federal Water Pollution Control Act of 1972 with Amendments (PL92-500)

Federal Regulations:

1. Hazardous Waste Guidelines and Regulations Proposal (F.R. December 18, 1978)

2. Solid Waste Disposal Facilities (F.R. February 6, 1978)

State Laws:

1. Solid and Hazardous Waste Management (Section 32.1-177 thru 32.1-186)

2. State Water Control Law (Chapter 3.1 of Title 62.1 of the Code of Virginia)

State Regulations and Guidelines:

1. Land Application of Sludge, Liquid Effluent and Other Wastes: Best Management Practices

2. Solid Waste Management Plan (February, 1979)

3. Sewerage Regulations (February 1, 1977) Section 62.1-44.19 (8) of the Code of Virginia (1950)

4. Solid Waste Regulations (Adopted by the State Board of Health April 1, 1971)

The disposal of sewage sludge is becoming more acute as a result of the increasing volume of sludge and the new environmental regulations that require better methods of disposal.

Compliance:

In accordance with applicable laws, the State Department of Health and the State Water Control Board jointly adopted sewerage regulations, effective February 1, 1977; compliance is mandated.

Effects:

Solid wastes, including sewage sludge, can be beneficial in agricultural and forestry applications by providing nutrients, trace metals, pH adjustment, soil building, or retention of moisture on certain types of soil. Forestry applications are broader as they are not limited by certain hazardous substances that may enter the food chain unless the forest is cleared and used for crop production.

Negative effects for food chain crops occur when wastes contain hazardous concentrations of pathogens, heavy metals, organics and other toxic substances that may become incorporated in the crops constituting a hazard to human and animal health.

The adverse effects of land application of solid waste containing hazardous compounds would apply equally to both large and small farmers. As solid wastes are generated on a continuing basis, land application is contractually simplified in using large tracts as opposed to small, multiple tracts of land.

Monitoring:

As new Federal regulations are developed, they are reviewed for specific application. Guidelines for land application are proposed and appropriate agency regulations promulgated in accordance with the Administrative Process Act. The Solid Waste Management Plan includes the legislative and

regulatory objectives and constitutes monitoring of environmental laws by the Department of Health.

As EPA regulations are proposed or promulgated affecting land application, proposed changes will be made in State regulations. The regulations on solid waste disposal should encourage land application where beneficial with sufficient management and inter-departmental oversight to assure protection of public health. Hazardous elements of solid waste constitute a sufficient threat to food-chain crops to make effective regulatory controls a necessity.

Clean Air Act

Federal Laws:

Clean Air Act of 1963, as amended in 1970, 1974 and August, 1977.

State Laws:

The Air Pollution Control Law of Virginia - Title 10, Chapter 1.2, Sections 10-17.92 thru 10-17.30:1. Passed in 1966 and amended several times.

State Regulations:

Regulations for the Control and Abatement of Air Pollution

Local Ordinances:

Fairfax County (including the cities of Fairfax and Falls Church), Alexandria, Richmond, and Roanoke County and City of Salem have local laws and federal funding. Lynchburg, Roanoke and Loudoun County have local ordinances but do not receive federal funds.

The State Air Pollution Control Board has adopted rules and regulations to carry out the mandate of the law. They have been compiled in a booklet entitled "Regulations for the Control and Abatement of Air Pollution." The major effects of these regulations on Virginia agriculture and/or forestry are the regulations concerning open burning.

Compliance:

The following agricultural and forestal management practices have been approved by the Air Pollution Control Board and no special permits or additional approvals are needed by the farmer to comply with the law.

The Forest Management Practices by open burning approved by the Board are:

1. To reduce forest fires and minimize the effect of wild fires.

2. To control undesirable growth of hardwoods.

3. To control disease in pine seedlings.

4. To prepare forest land for planting or seeding. For these practices the following conditions must be adhered to:

   a. Stumps are not to be deliberately uprooted.

   b. The material is not to be deliberately piled or bunched together.

5. To create a favorable food and cover habitat for certain species of wildlife.

6. To remove dead vegetation for the maintenance of railroad, highway and public utility rights-of-way.

The agriculture practices by open burning approved by the Board are:

1. To destroy undesirable vegetation.

2. To clear orchards and orchard prunings.

3. To destroy fertilizer and chemical containers.

4. To denature seed and grain which may no longer be suitable for agriculture purposes.

5. To prevent loss from frost or freeze damage.

6. To create a favorable food and cover habitat for certain species of wildlife.

Effects:

Effects permit farmers and foresters to continue to use fire to destroy unwanted vegetation and orchard prunings; to practice controlled forest burning; to prevent frost damage; and the like.

The Regulations for the Control and Abatement of Air Pollution have the same impact on both large and small farmers. It is believed that the impact is minimal because of the past mutual cooperation between all concerned.

Monitoring:

The regulations for the control and abatement of air pollution are enforced by personnel from seven regional offices. These regional offices are located in Abingdon, Radford, Lynchburg, Fredericksburg, Richmond, Virginia Beach and Falls Church. There is one sub-office in Winchester. The enforcement of open burning requirements is coordinated very closely with local entities.

Clean Water Act

Federal Laws:

1. Clean Water Act of 1977 (PL95-217)

2. Federal Water Pollution Control Act of 1972 as amended (PL92-500)

Federal Regulations and Programs:

Rules, regulations, guidelines and standards for the Clean Water Act.

State Laws:

State Water Control Law (Chapter 3.1 of Title 62.1 Code of Virginia of 1950 as amended)

State Regulations and Program:

1. Animal Waste No-Discharge Certificate Manual.

2. Board Approved Animal Waste Policy.

General:

The State Water Control Board requires no-discharge certificates for all livestock and poultry facilities that collect, store, and handle animal wastes. These are not required of small operations where the animals are not confined and have sufficient range. Certificates are also required for log storage, sorting or processing when state waters may be affected.

Compliance:

Persons concerned may apply to the Water Control Board for a no-discharge certificate and the application shall be accompanied by a copy of the pertinent plans, specifications, maps and such other relevant information as may be required. A cost-share with the farmer is available up to about 50% but may be increased in hardship cases. Help with design specifications and plans may be obtained from the USDA Soil Conservation Service or the Virginia Cooperative Extension Service.

Effects:

Improvement of water quality, soil conservation, water conservation, and recycling of nutrients are positive effects.

On the negative side are the cost of pollution control facilities; possible relocation of some livestock facilities and installation of rainfall runoff structures; delays in expanding livestock operations; and when large investments are required, inadequate cost-share funds for small operators.

All sizes of animal units in confinement are subject to regulations on pollution abatement and the economies of scale for large operators would be more favorable than for the small unit operator.

Monitoring:

Several agencies and organizations in the State have had and should continue to make input into the amendments of current laws and regulations and take action necessary to monitor their application. Such agencies are Virginia Department of Agriculture and Consumer Services, State Water Control Board, Virginia Polytechnic Institute and State University, Virginia Water Resources Research Center, Virginia Soil and Water Conservation Commission, Virginia Soil and Water Conservation Districts, USDA Soil Conservation Service, Virginia Division of Forestry and the Virginia Department of Health.

Pesticides and Herbicides

Federal laws:

1. The Federal Insecticide, Fungicide and Rodenticide Act.

2. The Federal Food, Drug and Cosmetic Act (Sets tolerances).

Federal regulations and programs:

1. Regulations for the administering of FIFRA.

2. Regulations for the administering of the Food, Drug and Cosmetic Act.

State laws:

1. Virginia Pesticide Law. (Sections 3.1-189 thru 3.1-249.21)

2. Virginia Pesticide Use and Application Act of 1975

State regulations:

1. Rules and regulations for the enforcement of the Virginia Pesticide Law.

2. Rules and regulations for the enforcement of the Virginia Pesticide Use and Applicator Act of 1975.

Programs:

A program for training both private and commercial applicators in the proper and safe use of the more hazardous pesticide chemicals minimizes any adverse effects on the environment and the applicator.

Pesticides are essential for the production of food and fiber and the protection of health and property, however, pest management has reduced the amounts needed in some instances. The development of resistant plant varieties, improved cultural methods, biological controls and proper timing of application when surveys indicate a need, rather than applying on a schedule, are significant improvements in pest control. Chemical pesticides still play a major role in pest management and will continue to do so.

The National Academy of Science reported in 1975 that the total amount of pesticide residues ingested in food averaged 0.0014 ounce per person per year in the U.S. The acute toxicity of the residues has been estimated as about the equivalent of the toxicity of one aspirin tablet. The data used by the Academy came from a time interval when chlorinated organics, which degrade slowly, were acceptable.

Compliance:

A farmer, to comply, has to pass a competence examination for an agricultural classification private applicator license for applying pesticides classified for restricted use. He may also apply them under the direct supervision of a certified applicator. In addition, the farmer is required to follow the label and avoid misuse of pesticides that are registered for the purpose for which he is applying them. The license is needed to buy rstricted use pesticides but not those classified for general use. Financial responsibility or record keeping is required if the farmer chooses to get a commercial, rather than a private applicators license, and performs for hire or custom work.

Effects:

The training provided for private and commercial applicators in the safe and proper use of the more hazardous pesticide chemicals should minimize any adverse effects on the applicator and the environment. This training program required for licensing and licensing renewals becomes more significant as the more highly toxic chemicals replace the less toxic but more persistent chlorinated

organics such as DDT and Dieldrin.

On the negative side it appears that many, if not all, pesticide chemicals are suspected of being carcinogenic or at least of producing tumors (oncogenic) when fed in large doses to test animals. This in itself tends to jeopardize the continued use of these products in agriculture and forestry and impacts on all operations regardless of size.

Monitoring:

All pesticides are regulated at the Federal level by EPA as to sale, distribution, use and disposal, and the Virginia Department of Agriculture and Consumer Services was designated by the Governor as the head agency in Virginia to conduct a similar program including certifying and licensing of restricted pesticide applicators.

All proposed amendments and regulations under the FIFRA are being closely monitored by the Virginia Department of Agriculture and Consumer Services, the Virginia Cooperative Extension Service and other organizations, e.g., Farm Bureau and The Division of Forestry. Comments and recommended changes are made as appropriate. The Virginia Department of Agriculture and Consumer Services had considerable input and influence in bringing about several amendments to the Federal law during 1978. These amendments provided more latitude and the flexibility to the states in registering pesticides for special local needs and in liberalizing certain application practices. The Virginia Cooperative Extension Service and the Virginia Department of Agriculture and Consumer Services are under a cooperative program, established by the U. S. Department of Agriculture, in which all proposed pesticide use restrictions proposed by EPA are monitored to determine the impact upon Virginia agriculture and forestry. Appropriate comments are made when such restrictions adversely impact on Virginia.

Food and Drug Administration (FDA) Laws and Regulations

Federal Laws:

The Food, Drug, and Cosmetic Act regulates the interstate movement of all foods for human consumption and animal feeds and applies equally to large and small farmers.

State Laws:

1. The Virginia Meat and Poultry Products Inspection Act makes direct reference to the Federal Food, Drug and Cosmetic Act in sections 3.1-884.14 and 3.1-884.29.

2. The Virginia Food Law, Commercial Feed Law, Animal Remedies Law, and Canned Animal Food Law complement the Food, Drug, and Cosmetic Act in the control of products produced in Virginia as well as those moving into Virginia from other Sources.

The primary emphasis of the Food, Drug and Cosmetic Act is labeling, specifications for standardized products, regulation of food additives, and protections of the food supply form harmful substances, including illegal pesticide residues, drugs, and industrial chemicals. The primary emphasis on animal feeds is to assure that they are safe for the intended uses, are adequately labeled to provide for proper use, and to prevent illegal residues in the human food products produced.

Compliance:

Mandated compliance is explicit in the law.

Effects:

Provides consumers of agricultural products and processed foods a high degree of assurance as to the safety and wholesomeness of the food supply.

The regulation of additives, drugs, and pesticide residues impact on the cost of production, but when the effects are considered as a whole they cannot be regarded as negative. Without regulation, these production inputs would probably not be available for use and their absence would reduce production potential, increase cost of production, and result in less quality food being available.

Monitoring:

FDA Laws and Regulations are monitored regularly and routinely by the Virginia Department of Agriculture and Consumer Services through daily review of the Federal Register, by cooperative work-sharing agreements with FDA, through contracted inspections by the Virginia Department of Agriculture and Consumer Services for FDA under commissioning procedures, and through frequent personal contact with FDA personnel.

The FDA Laws and Regulations apply equally to large and small farmers and have relatively the same effect on both.

Resources Conservation Act

Federal Laws:

Resources Conservation Act (RCA) of 1977 (PL 95-192). A federal law designed to appraise the soil, water and related resources; analyze conservation programs; and analyze conservation practices. The Soil Conservation Service of the United States Department of Agriculture is the responsible agency.

Programs:

1. National Soil and Water Conservation Program. The responsible agency is the SCS/USDA.

2. State Soil and Water Conservation Program. The responsible agencies are the Virginia Soil and Water Conservation Commission and the Virginia Soil and Water Conservation Districts.

The broad objectives of the RCA are: The protection and enhancement of land, water and related resources for sustained use; strengthening the technical base for solving problems; increasing public participation in conservation development; and developing a National Soil and Water Conservation Program.

The broad objectives are translated into three major goals:

1. Appraise, on a continuing basis, the soil, water, and related resources of the nation, including fish and wildlife habitat.

2. Develop and periodically update a national program for furthering the conservation, protection and enhancement of the soil, water and related resources consistent with the roles and program responsibilities of other federal agencies, state and local governments.

   Under cooperative arrangements between the federal government and State Soil and Water Conservation Agencies, through conservation districts and land users, develop a state soil conservation program.

3. Provide periodic progress reports to Congress and the public.

Compliance:

The Resources Conservation Act does not require compliance, per se. It is an approach to simply identify the current status of resource conservation and provide direction to efforts to protect and enhance the land, water and related resources for sustained use.

Effects:

A national soil and water conservation program will come from efforts authorized by the Resources Conservation Act.

A state soil and water conservation program will be developed cooperatively with the Virginia Soil and Water Conservation Commission.

The overall effect will be positive and will not differentiate between large or small farmers.

Monitoring:

Resources Conservation Act (Administered by the Soil Conservation Service, USDA) and the Resources Planning Act (Administered by the Forestry Service, USDA) provide for public input during all phases of the programs. The RCA specifically addresses monitoring through worksheets designed to obtain and collate information in six areas; resource conerns and problems, problem development, the impact of technology, program performance indicators, analysis of legislative authorities, and public participation.

Agricultural and Forestal Labor Laws and Regulations

Federal Laws and Regulations:

1. Child Labor Laws - Generally exempts agriculture from coverage except that no child under 18 may work in logging operations. Farmer must keep employment records.

   Alien Laws - Make it illegal for farmer to employ an alien who cannot provide documents indicating that he or she is legally eligible for U.S. employment. Non-agricultural employers, on the other hand, are not required to obtain proof that an alien is legally eligible for U.S. employment.

2. 20 CFR 620: Employment and Training Administration, Department of Labor (DOL) Housing Standards prior to OSHA Standards - still on the books.

   Federal Regulations 1910.142 OSHA Housing Standards.

   "All new migrant housing built on or after January 1. 1979, will be subject exclusively to 29 CFR 1910.142 OSHA Housing Standards."

3. Federal Register, Volume 43, No. 48, March 10, 1978, Part VIII - Employment and Training Administration, DOL Temporary Employment of Alien Agricultural and Logging Workers in the U.S.

   – Labor Certification Process - Farmers must recruit thru the U.S. Employment Service and major newspapers for 60 days to determine that suitable, willing and domestic labor is unavailable before USDOL will certify the fact. DOL then authorizes U.S. Immigration and Naturalization Service to permit alien labor work permits.

4. Federal Register, Volume 42, No. 16 - January 25, 1977 Part VIII - Employment and Training Administration MIgrant and Seasonal Farmworkers Employment Service.

   – Complaint System, Monitoring and Enforcement. Farmworkers may complain to federal or state labor officials about employment without fear of reprisal. If the employer is found guilty of violating nay Employment Service Regulations, he may be penalized according to law.

5. Fair Labor Standards Act of 1938 as amended, Wage and Hour Division, Employment Standards Administration, DOL.

   (a) Federal Wage & Hour Law - If a farmer used more than 500 man days of farm labor, excluding family labor, in any calendar quarter of the preceeding calendar year he is subject to the federal minimum wage law – $2.90 beginning January 1, 1979 – $3.10 beginning January 1, 1980 – $3.15 beginning January 1, 1981

   (b) Equal pay for equal work regardless of sex applies.

   (c) Child Labor Laws apply - Age 16 and up may work any farm job including those declared hazardous by the Secretary of Labor. Employment of those children under 16 years have certain restrictions which if violated carry up to a $1,000 fine. Employers must keep detailed records. Youth must be paid minimum wages if job is covered by the Act, unless a specific exemption applies,

   (d) Farm Labor Contractors Registration Act - A farmer may not engage a "Migrant Crew Leader" to perform agricultural services unless he is registered with DOL and has a certificate of registration. The crew leader may not occupy the farmers housing unless it has met health and safety requirements and a certification has been issued by the local Health Agency. Farmers who recruit their own workers are exempt.

   (e) Pay Records - Every covered employer must keep pay records of every employee which meets the requirements of Federal law, even though employees are members of a migrant labor crew. The records must be maintained for two years.

(f) Sub-Minimum Wage Provisions - Learners, apprentices, and handicapped workers may be paid less than the established minimum wage in agriculture provided the employer obtains a special certificate from the Wage and Hour Division, DOL.

(g) Employer Furnished Facilities - The reasonable cost or fair value of board, lodging and other facilities provided by the employer may, as determined by the Wage & Hour Administrator, be considered part of wages.

(h) Forestry and Logging Operations - Generally does not affect farmers, however, details of exemptions are very specific and differ in nearly every individual case.

State Laws and Regulations:

1. Title 40.1 Code of Virginia - Virginia Department of Labor and Industry.

(a) Safety & Health Standards for Agriculture

1. 1910.128 Safety & Health Standards

2. 1910.142 Safety in Migrant Labor Camps

3. 1910.266 Safety in pulpwood logging

(b) Virginia Minimum Wage Act - Exempts any person working on a farm.

2. Title 9-149 through 152 Code of Virginia - Virginia Employment Commission.

Migrant and Seasonal Farmworkers Commission. The Commission was created during the 1978 Session of the General Assembly and appointed later that year. The Commission has met numerous times and will report annually to the Governor and General Assembly. The Commission has studied the needs of farmworkers and the employers of such workers. Evaluation of laws and regulations and services available from federal, state and private sources has been the main thrust of the Commission. Options for solutions to identified problems will be contained in the Commission Report.

3. Title 32, Chapter 36 - Virginia Department of Health.

Migrant Labor Camps - A farmer must get a preoccupancy inspection from his local health agency. Housing is also subject to inspection citations and fines during occupancy by state inspectors; monitored by federal inspectors.

Title 32 - State Migrant Housing Standards - Health Department, still on books.

4. Unemployment Insurance - The State Unemployment Insurance Law enforced by the Virginia Employment Commission included agricultural operations beginning January 1, 1978 and will include alien farmworkers after January 1, 1980. Small farm operations are generally not covered by the law. Those operations must pay unemployment insurance who employ ten or more individuals for part of any day in a week for any twenty different weeks during a calendar year; or a $20,000 or more total gross quarterly payroll during a calendar year.

Programs:

Federal Register, August 6, 1974, Title III, Section 303, Comprehensive Employment and Training Act of 1973 - Manpower Administration, DOL.

Migrant and Other Seasonally Employed Farmworkers Programs - Since January 1975, a North Carolina firm incorporated in Virginia as the "Migrant & Seasonal Farmworkers Association of Virginia, (MSFA)" has as its stated purpose, among other things, the recruitment of farmworkers into other more meaningful employment. Farmers in Virginia, in some cases, have been reluctant to welcome MSFA personnel on the farms to disturb workers, decrease productivity and create unrest in labor camps. Farmers have been taken to court by MSFA paid American Civil Liberties Union attorneys because MSFA personnel were denied access to labor camps.

The fiscal 1978 DOL grant to MSFA of Virginia to carry on its work amounted to $1.3 million.

The Virginia Employment Commission has applied for the CETA 303 Grant unsuccessfully for four years. The Virginia Employment Commission is in a better position to provide services to farmworkers across the state because of its network of easily accessible offices and its ability to deliver services with the least administrative overhead.

Effects:

Most federal and state labor laws have been written for the benefit of workers. There appears to be little federal or state legislation for the protection of agricultural employers. Volumes of regulations have been written by federal and state agencies to enforce labor laws. Most laws have exemptions for family labor and for small farms, however, the minute details of labor laws and regulations are voluminous and written in legalistic language that is difficult for the layman to read and understand. Many farmers learn about the law when an inspector visits the farm and finds the farmer in violation and cites him with a financial penalty for violating a law. "Ignorance of the law is no excuse," however, there is an imbalance of protection for the worker at the expense of the farmer who does not have at his personal disposal the resources necessary to compete in a legalistic society.

Section 40.1-79, Code of Virginia exempts children employed on farms, in orchards or in gardens from any provisions of Virginia's Child Labor Laws, except no employment during school hours and must have consent of parent or guardian. Because of this exemption no time records are required for minors 18 years of age and under, and there are no regulations of hours of work. Only farm and forestry operations employing more than ten persons, excluding family members, at any one time during a calendar year fall under Title 40.1, except that no child under 18 years of age may be employed in logging. It is estimated that approximately 12% of all farms and 25% of forestry operations are covered by Title 40.1.

Monitoring:

Virginia Department of Labor and Industry inspectors cover all parts of the requirements of the law on a scheduled and complaint basis. As a result of Federal pressure under OSHA, top priority is given to migrant labor camps. The 1910.128 (OSHA) Safety & Health Standards monitored by the federal and state inspectors on Migrant housing is the only instance where a non-workplace is regulated. Migrant housing is very expensive to construct, operate and maintain.

Farmers, because of migrant camp operations and the multitude of other federal regulations and general difficulties associated with migrant labor, are gradually moving away from labor intensive crops or are recruiting alien labor. Vegetable production, primarily on the Eastern Shore, is being reduced gradually in favor of corn and soybeans which are almost totally mechanized. Fruit and tobacco growers, unable to get adequate domestic labor are increasing the use of alien labor. The U.S. Department of Labor zealously enforces the laws and regulations to make alien labor procurement as difficult as possible in their effort to reduce national unemployment. Apple growers have organized in Northern Virginia and must employ an attorney to guide them thru the federal DOL Labor Certification Process. Flue-cured tobacco growers are having to use an attorney in their efforts to procure adequate labor.

State and Federal welfare laws are a hindrance to farmers in their procurement of local part-time labor. There is often no incentive for able bodied people to work on the farm or in food processing plants, because their welfare payments would be reduced by the amount earned. The problem has existed for decades and appears to defy solution.

Foreign Ownership of Agricultural Land in Virginia

Federal Laws:

Agricultural Foreign Investment Disclosure Act of 1978 (P.L. 95 - 460) - This law requires foreigners who hold or acquire agricultural land to report those holdings to the Secretary of Agriculture. In addition to name, address, citizenship or country of origin of the owner, data will be collected on the area, value, and tenure relationship of the agricultural land. Data are collected by the Agricultural Stabilization and Conservation Service (ASCS), and reports are prepared by the Economics, Statistics, and Cooperative Service (ESCS), both of which are agencies of the United States Department of Agriculture.

State Laws:

Virginia Foreign Agricultural Investment Act of 1979, Title 3.1, Chapter 4.4, Section 3.1-22.22 through 3.1-22.27. (House Bill 1877) - This act establishes a reasonable and workable monitoring system for providing reliable information on a timely basis. The Virginia Department of Agriculture and Consumer Services, with the cooperation of the Agricultural Stabilization and Conservation Service, analyzes data relating to foreign ownership of agricultural land in Virginia and reports its findings in the Department's Annual Report.

Substantial foreign ownership of agricultural land could further inflate land prices; result in the production of specialized commnodities affecting both domestic and foreign markets; and disrupt or destroy historically farming communities.

Compliance:

Not applicable to Virginia farmers.

Effects:

The Agricultural Foreign Investment Disclosure Act does not in any way restrict foreign investment in U. S. real estate. Its purpose is for information only.

The Virginia Foreign Agricultural Investment Act of 1979 will give Virginia the kind of data needed to determine the extent of foreign ownership of our agricultural land, the impact of foreign ownership on agricutural land prices, the impact of foreign ownership on our historical farming communities and the potential impact on Virginia's food and fiber supplies.

Monitoring:

Up-to-date information and data are maintained by the Virginia Department of Agriculture and Consumer Services.

Agricultural and Forestal Taxation

Federal Laws:

1. Tax Reform Act of 1976

2. Amendments to Estate and Gift Tax Laws

State Laws:

1. 1971 Constitutional amendment allowing land use assessment and taxation.

2. 1972 Land Use Assessment Law providing for land use assessment of agricultural, horticultural, forestry, and open space real estate as a local option.

3. Amendment to inheritance and gift tax laws.

4. 1977 Agricultural and Forestal Districts Act.

Programs:

1. Sixty-six (66) localities have adopted land use assessment ordinances as of October 25, 1979.

2. Fifteen (15) Agricultural and Forestal Districts have been established in Virginia as of October 10, 1979. They contain 36,299 acres.

Real estate assessment and taxation has changed dramatically during the past decade because of the tax laws and programs enumerated above.

Compliance:

The adoption of land use assessment ordinances and the approval of agricultural and forestal districts is at the option of local governments. All others are explicit in mandatory compliance requirements.

Effects:

1. Positive - The federal, state and local tax programs in some instances have slowed the rate of taxation on farm real estate and possibly the shifting of productive agricultural land to nonagricultural uses.

2. Negative - Real estate taxes are a contributing factor to the farmers' relatively low income position. Even with the existing tax programs, real estate taxes have consumed a larger and larger part of gross farm income in Virginia. The incidence of taxation falls directly on the farmer and reflects a tax burden because the farmer cannot shift the tax burden to others.

Monitoring:

The Virginia Department of Agriculture and Consumer Services, in cooperation with other state agencies, continues to evaluate the effects and to provide information and technical assistance to the agricultural community.

Personal Property Tax

Federal Laws:

None

State Laws:

Personal Property Taxation Statute as amended (1976)

Most local governments assess personal property taxes on all tangible personal property including farm machinery. As a result of a constitutional amendment, the 1976 General Assembly amended the property taxation on tangible farm machinery. Since 1976, several localities have exempted farm machinery from personal property taxation.

Compliance:

Explicit in mandating compliance

Effects:

1. Positive - Increased tax revenues for localities.

2. Negative - Rapid increases in farm machinery costs and assessed values are placing additional tax burdens on farmers.

Monitoring:

The Virginia Department of Agriculture and Consumer Services in cooperation with other state agencies continue to evaluate the effects and to provide information and technical assistance to the agricultural community.

Virginia Retail Sales and Use Tax

The Virginia retail sales and use tax at the rate of 2% became effective September 1, 1966. As of July 1, 1968, the rate of 3% went into effect. Under the Act imposing the tax, any city or county may impose a total sales tax at the rate of 1%. The base of every local sales tax is exactly the same as the base of the state sales tax. The rate of the local tax is added to the rate of the state sales tax.

Compliance:

The tax is collected at the time of the sale by the dealer and remitted to the Virginia Department of Taxation. Section 1-4, agriculture, exempts the following commodities from the tax: Commercial feeds, seeds, plants, fertilizers, liming materials, breeding and other livestock, semen, breeding fees, baby chicks, turkey poults, agricultural chemicals, fuel for drying or curing crops, baler twine, containers for fruits and vegetables, or farm machinery, or any other agricultural supplies, provided the same are sold to and purchased by farmers for use in agricultural production for market. These exemptions do not apply to purchases for personal or family use or consumption as distinguished from purchases for use or consumption in agricultural production for market. Exempt items are purchasable under Certificates of Exemption. A farmer who is not engaged in the business of producing agricultural products for market cannot claim agricultural exemptions. The production of colts on a horse farm for sale is regarded as "agricultural production", and a farmer-horse breeder may purchase horses for the purpose of producing colts for sale, free of the sales and use tax, provided the horses are purchased solely for use for breeding purposes.

Farmers regularly engaged in selling tangible personal property at retail shall file Application for Certificates of Registration, collect and remit the tax due.

The tax applies to retail sales of farm products, whether sold by farmers, peddlers or at a public market, roadside stand, farm or any other place, provided such activity is regular or recurring and not occasional as defined in Section 1-75.

Section 1-5 makes certain exemptions for commodities used in food processing. The tax does not apply to any agricultural commodity or kind of seafood sold or distributed by any person to any other person, who pruchases for the purpose of acquiring raw products, for use in the process of preparing, finishing, or manufacturing such agricultural or seafood commodity for the ultimate retail consumer trade, except when such agricultural or seafood commodity is actually sold or distributed as a marketable or finished product to the ultimate consumer. The term "agricultural commodity" means horticultural, poultry, farm products, and livestock products.

Effects:

1. Positive - Generates both local and state revenues from all citizens.

2. Negative - The Virginia Sales and Use Tax Law and Regulations apply to food as well as to other itmes sold at retail. This often adds to the tax burden of the poor and the senior citizens on fixed incomes especially in times of inflation.

   Many farmers and dealers are not sure of the interpretations of the law and regulations, especially as to exemptions and nonexemptions.

3. Differential - None.

Monitoring:

The Virginia Department of Agriculture and Consumer Services in cooperation with other state agencies continue to evaluate the effects and to provide information and technical assistance to the agricultural community.

Best Management Practices

Federal Laws:

1. Federal Water Pollution Control Act (Public Law 92-500) as amended (1972)

   Section 208 of PL 92-500 requires each state to develop a nonpoint source control program which includes agricultural and forestal activities. Nonpoint sources are diffuse in nature and are to be controlled by the application of best management practices.

   The Environmental Protection Agency is responsible for administration of the law.

2. Federal Environmental Pesticide Control Act of 1972 regulates pesticide use.

3. Federal Insecticide, Fungicide and Rodenticide Act controls manufacture, sale and transport of pesticides.

State Laws:

State Water Control Law - Section 62.1-44.3(6)

The State Water Control Board has statutory responsibility to regulate nonpoint sources of water pollution.

Programs:

1. Rural Clean Water Program (PL 95-217). The Soil Conservation Service, USDA has the administrative leadership responsibility.

2. Agricultural Stabilization and Conservation Service is the primary USDA agency providing cost-sharing assistance for conservation practices.

3. Farmers Home Administration, USDA is authorized to assist in implementation of rural programs through low-interest loans.

4. Science and Education Administration, USDA is to conduct research in areas of agricultural production, soil erosion, sedimentation and water pollution.

5. Virginia Cooperative Extension Service, Virginia Polytechnic Institute and State University and Virginia State University has primary responsibility for agricultural information and education, including information on the use of agricultural chemicals, cultural practices and animal and crop processing waste disposal to maximize effectiveness and reduce potential nonpoint source pollution.

6. Virginia Agricultural Experiment Station has responsibility for agricultural research as a part of the Land-Grant University and Science and Education Administration, USDA.

7. Virginia Division of Forestry provides technical assistance in preparing forest management plans and has primary responsibility for the protection of forest resources from wildfires, forest pests including insects and diseases. (See Appendix D for additional information on Division of Forestry Responsibilities.)

8. In implementation of the Rural Clean Water Program, the Soil and Water Conservation Districts, (administratively supported by the Virginia Soil and Water Conservation Commission) approve participant's water quality improvement plans and with the ASCS County Committee set priorities for assistance among individual landowners and operators. SWCD's also approve reclamation plans under the Rural Abandoned Mine Program.

The term "best management practices" (BMP) means a practice, or a combination of practices, that is determined by a state (or designated area wide planning agency) after problem assessment, examination of alternative practices, and appropriate public participation to be the most effective and practical (including technological, economic and institutional considerations) means of preventing

or reducing the amount of pollution generated by nonpoint sources to a level compatable with water quality goals.

Compliance:

Compliance with PL 92-500 is mandated. The Environmental Protection Agency, at the federal level, and the State Water Control Board, at the state level, are responsible for regulating nonpoint pollution, under a regulatory or a non-regulatory (voluntary) program, whichever is the most practicable.

Effects:

1. With the installation of agricultural BMP's, the beneficial effects will be (a) less erosion thereby maintaining or enhancing the soil productivity, (b) more efficient use of plant nutrients and pesticides, (c) conservation of moisture for crop use during droughts, (d) additional water supplies for livestock, (e) improved management facilities for animals and animal wastes, (f) better utilization of water and forages by livestock through better distribution, and (g) improved aesthetics.

2. The most obvious negative effect of agricultural BMP implementation, in many cases, will be cost. This can be a direct cost resulting from the installation of BMP's on the land as well as the purchase of equipment to carry out other practices. Indirect costs can occur by taking land out of production or changing land use to that which gives a lower return. With respect to the implementation of BMP's for forestry, one negative impact could be lower prices when the landowner requires the control measures to be completed by the timber buyer or logger.

3. The requirements of BMP implementation will be site oriented and will affect large and small farmers alike as far as treatment required. The economic impact on large and small farmers for BMP implementation may differ. Large farmers may be more able to absorb increased costs and large operating units will have more options for changing land uses to avoid high treatment costs on some lands. Small farmers must operate on the land they have available and land use changes may not be an option. Landowners with sufficient capital from farm or nonfarm income will generally be in a better position to carry out BMP implementation regardless of ownership size.

Monitoring:

Nationally, the United States Environmental Protection Agency, United States Department of Agriculture and National Association of Conservation Districts are monitoring developments relating to Best Management Practices. In Virginia, the State Water Control Board is responsible under the Statewide Section 208 Program. A number of state agencies have taken the lead in developing Best Management Practices Handbooks and these have been reviewed by a State Policy Advisory Committee. Final approval of Best Management Practices Handbooks is anticipated prior to June 30, 1980 and implementation on a voluntary basis is anticipated.

Farm Vehicle Laws

STATE LAWS:

VA Code § 46.1-348 et. seq.

Laws specifically relating to farm vehicles are unclear and in need of revision in two respects:

1. The Governor's Proclamation of April 1, 1974 expressly excluded farm vehicles from the inspection requirement. Since this information is not statutory, its applicability is not widely known.

2. Statutes governing operators licensing exemptions are unclear. Va. Code § 46.1-352 specifically exempts operators of farm tractors, farm machinery and farm use vehicles from the operator's licensing requirement. Yet, under Va. Code § 46.1-350, a person whose operator's license has been suspended or revoked or who has been directed not to drive by a court, by the Commissioner, or other authorized public agency, is guilty of an offense if such a person drives any motor vehicle or any self-propelled machinery or equipment on the highways of the state. No exemption appears for operation of a farm vehicle although in other sections (Va. Code § 46.1-352.1, § 46.1-487.8) exemptions are included for farm tractor operation even after conviction for driving under the influence of intoxicants or as an habitual offender.

Dogs Damaging Livestock

VIRGINIA LAWS:

VA Code § 29-183 *et. seq.*

Va. Stat. § 29-202 provides for compensation to the owner of livestock or poultry killed or impaired by dogs. This statute appears to be deficient in two respects:

1. The statute provides that the livestock or poultry owner shall receive a "reasonable value of such livestock or poultry but not more than the assessed value of such livestock based upon the fair market value of such livestock and the fair market value of unassessed lambs, calves, and poultry." Apparently, there is considerable variation from county to county as to how the "reasonable value" is determined, although the statute itself requires the claimant to furnish evidence of quantity and value.

2. The same statute provides that "No payment by the county or city shall be made ... unless and until the claimant shall have exhausted his legal remedies against the owner of the dog doing the damage ..." The statute further provides that the county or city may require the livestock owner to submit evidence that legal remedies have been exhausted against the owner of the dog.

Fencing Laws

VIRGINIA LAWS:

VA Code § 8-866 *et. seq.*

Virginia fencing laws are out-dated and in need of revision in three major respects:

1. Va. Code § 55-305 to § 55-316 provide remedies for animal trespass but allow the governing body of counties to make local fencing law. Thus, some Virginia counties have fencing provisions while others have "no fence" provisions. Several counties have no records to indicate which provisions apply. Therefore, it is difficult for a citizen to know what provisions are applicable in any given county.

2. Under Va. Code § 55-317 to § 55-322 governing division fences, uncertainty exists as to whether a landowner may elect to allow his land to "lie open" and refuse to share in the cost of repairing an existing division fence.

3. Under Va. Code § 55-299 to § 55-303 the definition of what constitutes a lawful fence is detailed. The definition does not conform to modern practice and is unclear in both intent and content.

APPENDIX D

The Forestry Industry In Virginia

INTRODUCTION

The forest resources of Virginia are vital to her economy and well-being of her citizens. There are over 16 million acres which comprise about 64 percent of the total land area of the Commonwealth, dedicated to forestry.

The forest products industry employs 16 percent of the wage earners in the state; pays 14 percent of wages and salaries of workers; and accounts for 16 percent of the value added by manufacturing. Total value of the wood using industry is approacing the $2 billion level. In addition, several hundred million additional dollars are annually added to the state's economy by hunting, fishing, tourism and other recreational attractions of the forest.

Governmental and industrial forest ownerships amount to 23 percent of the total forest lands. The remaining 77 percent, approximately 12.3 million acres, is owned and controlled by individuals, partnerships, families and others. The average small ownership is less than 50 acres.

Many owners of small timber tracts are not concerned with wood production and objectives of ownership are nearly as varied as numbers of individual owners. Long-term aspects of timber production are not particularly attractive to the average landowner. Ad valorem, estate, income and capital gains taxation policies plus pricing structure, markets, land use and risk factors deter adequate forest management practices of individual landowners. Opportunities of a more technical nature in forest production and wood utilization are available to make the forestry industry in Virginia more valuable. These opportunities are closely allied with increased emphasis on research and continuing education programs through which increased forest production, enhanced wildlife populations, additional recreation opportunities and a stronger wood-using industry can contribute to an increased economic and esthetically pleasing standard of living for Virginians.

This Appendix outlines the existing conditions, problems and opportunities confronting the broad-based forestry industry and proposes methods to enhance its value to Virginia. Latest U. S. Forest survey statistics show Virginia's woodlands to average 52 cubic feet production per year. With higher intensity management levels on forest properties, this average could be increased to 75 cubic feet per year. Motivation to achieve this production would significantly increase the economic value of the forest industry and assure Virginia a share of the projected twofold increase in wood production to be needed within 40 years as shown in Chart No. 1. The private non-industrial landowners can produce the needed wood if management technology, utilization practices and equitable land use and taxation policies provide the incentive for long term investment.

The 1974 Interim Report.

"The Forest Products Industry of Virginia," 1974, an interim report developed by a task force of the Agriculture Opportunities Commission in cooperation with the Virginia Department of Agriculture and Consumer Services, provided an in-depth look at the forestry sector. Information and recommendations in this report continue to provide guidance to forestry interests.

Several significant developments and studies since 1974 have contributed to the understanding of forestry technology, economic consideration and application of forest practices in land management. Some of these include:

- Periodic assessment of the Commonwealth by the Department of Planning and Budget with most recent publication in September 1978.

- Annual survey of Virginia manufacturers by the Department of Labor Industry.

- The Renewable Resources of the South, USDA, U. S. Forest Service, 1977 providing information on forest resource potential in the South.

- Virginia's Timber, 1977, USDA Forest Service Resource Bulletin SE-44, providing the 10 year update on timber status.

- Virginia's Forest Products Industry, Virginia Polytechnic Institute and State University, FWS-3-78, giving an in-depth look at the industry relationships within localities and regions.

– Virginia Forest Productivity Report, 1979 by the Forest Industries Council in cooperation with the Virginia Forestry Association to determine the possibilities for improvement in forest production.

– The 1974 Forest and Rangeland Renewable Resource Planning Act (RPA), subsequently amended and expanded in the National Forest Management Act of 1976, provides a framework for making decisions in the use of the nation's forest resources by assessment and program development on 5 year intervals. The State Forester as directed by the Governor, with support from the RPA, will develop a comprehensive plan before 1983 that will address timber demands, wildlife concerns, forest uses, environmental protection and long-term considerations of the forest resources in Virginia.

– The Renewable Resources Extension Act, Forest and Rangeland Renewable Resources Research Act and the Cooperative Forestry Assistance Act all enacted by federal legislation in 1978 provide the state with cooperative assistance in various forestry programs.

I. PRESENT STATUS OF THE FOREST RESOURCE

Value of Timber Industry. - 1977.

The annual value of products, wages, salaries, and capital expenditures to Virginia's economy is about $2.18 billion based on information developed in 1977. The total work force of 73,600 accounts for one-sixth of the wage earners in Virginia. The annual value is as follows:

$ 89.5 million	stumpage value based on the average of reported prices in 1971.[1]
523.5 million	salaries and wages of workers in manufacturing.
1,377.3 million	value added by manufacturing.[2]
130.0 million	wood workers estimated salaries unpublished (13,000 workers at $10,000 per annum).
140.0 million	capital expenditure (average 5 year period, 1972-1976)[2]
$ 2.18 billion	TOTAL

Timber Resources. - 1977.

Total Forest Acreage - Approximately two-thirds or 16,417,379 acres of Virginia's land area is forested. Of this total, 15,972,723 is classified as commercial forest. Commercial forestland is defined as that land producing or capable of producing crops of industrial wood that has not been withdrawn from timber utilization.

Commercial Forest Acreage - Present trends toward more land being cleared for agriculture and developments than will revert to forest from abandoned agriculture or open land would indicate that the commercial forest land has reached a peak and will, in the future, be declining. The forest survey estimated a 600,000 acre loss in the next 30 years.

Approximately 49 percent of the commercial forestland is in the Coastal Plain and Southern Piedmont Regions. During the period 1966 to 1977, 205,000 acres or 2.6 percent of this forestland was lost to agriculture, urban or other uses while only 87,000 acres reverted to forestry from non-forest use. These regions contain 56 percent of all the commercial growing stock in Virginia and 70 percent of the softwood growing stock. The implications of this decline, which has accelerated in the past few years, will have considerable influence on the pine resource.

Forestland Ownership - The primary breakdown of forest ownership has changed very little from 1966 to 1977. Of the commercial forestland, public entities own 12 percent; the forestry industry owns 11 percent; and 77 percent is owned by the private sector other than the forestry industry (Chart No. 2).

Pine Type Continues to Decline - Much of timber industry in Virginia and the nation is dependent upon pine. Pine has desirable characteristics for construction and paper products. Proven methods of intensive management provide several times the volume of pine over hardwood on sites suited to pine growth.

The acres of pine timberland in Virginia have continued to decline from 4.5 million acres in 1957 to 3.4 million acres in 1977. This is reflected in the softwood and hardwood volume comparison in Chart No. 3. During the period between 1966 and 1977, a total of about 2 million acres was harvested and retained in commercial forest. At the time of the survey, only 24 percent of this acreage was dominated by pine. The survey indicates an average loss of pine forest to be 53,000 acres annually during the past 10 years. Increasing pine regeneration to an average of 85,000 acres annually, compared to 40,578 acres during the period 1956-1966, is still not keeping pace with the loss of pine type.

Hardwood Area Increases - During the 20 year period from 1957 to 1977, the acreage of hardwood increased by 15 percent for an average annual increase of 79,000 acres. Hardwoods resprout readily from a developed root system. Pines, incapable of sprouting, must start from seed and, therefore, cannot compete readily with the hardwood. This in turn causes much of the acreage in pine type to revert to hardwood, if alternative means of retaining pine are not used.

Growth and Cut - The net growth of growing stock of 52 cubic feet per acre is 38 percent above the adjusted growth rate of 1966. Hardwood growth accounts for three-fourths of this increase. The trend of pine growth between 1956 and 1966 showed a 15 percent decline. This trend has reversed in the past ten years to show a 15 percent increase in 1976 when compared to 1966. In the Coastal Plains area, however, growth still lagged removal by 9 percent in 1975. An ad hoc committee[3] studying this problem has indicated that deficits in the Coastal Plain in 1979 are estimated to be 27 percent for pine sawtimber and 17 percent for pine growing stock.

Growth increases have been occurring in areas of the state where markets are not available. The heavy demand for wood in the Coastal Plain and Southern Piedmont sections where forest industry is concentrated required imports of wood, primarily from North Carolina, to meet raw material needs. Virginia's balance of trade in sawtimber and pulpwood shows net imports of 33 million cubic feet. This breaks down into 42 million board feet of sawtimber and 373,000 standard cords of pulpwood (See Chart No. 5).

Timber Products - In 1976 the volume of sawlogs harvested was 1.013 billion board feet and pulpwood production was 2,661,800 standard cords.

Use of wood residues has increased from less than 50 percent in 1965 to better than 80 percent of the total available in 1976. Fuelwood removals have doubled over the survey period totaling about 120 million cubic feet, almost 60 percent of the total pulpwood produced.

[1] Compilation of forest products tax data and pulpwood or residue data obtained from the Southern Pulpwood Production Bulletin, U. S. Forest Service, 1977.

[2] Source: Virginia Department of Labor and Industry, 1976 Annual Survey.

[3] The ad hoc committee is composed of forest industry representatives, Virginia Division of Forestry and Lumber Manufacturers Association officials and was formed in August, 1979.

Utilization of Trees and Mill Residues.

– Market for Mixed Grade Chips - Wood chips are produced from total tree chipping, roundwood, slabs and edgings at sawmills and residues from wood products manufacture. Markets are limited when the percentage of total volume from bark, needles and small limbs increases. The technology to economically separate the clean chips for pulpwood from lower grade material for other uses, such as fuel, has not been developed.

– Markets from Small and Low Grade Hardwood - Only one-half of the total annual hardwood growth of 576 million cubic of growing stock is cut. The demand for railroad ties, pallets, furniture stock, speciality products, hardwood pulpwood, fuel and energy uses is less than the supply.

– Specialized equipment is not available for economically retrieving logging residues, small trees not utilized in harvesting operations, or thinning intermediate-aged stands of timber. The design of logging equipment has tended to be for bigger trees and large size areas, limiting the economical practicality of small timber operations.

Timber Supply.

– Pine sawtimber is declining in the Coastal Plain. Use of smaller sized logs for lumber is causing reductions in growing stock and these volumes are not available for pulpwood or other roundwood products. Possible results are:

- Market will shift westward
- More imported wood
- Greater use of hardwood to replace pine
- Increased need for reforestation
- Reduced manufacturing output

Pine Reforestration - Low volume and poorly stocked stands presently covering much of the area provide little incentive for landowners to increase timber production. Direct and indirect incentives must address this need. In Virginia a greater potential than present average growth has been identified on approximately 6,800,000 acres.

– Loblolly pine seed supply - There is a need to improve the quality and increase the quantity of loblolly pine seed available for reforestation purposes in Virginia. The Tree Improvement Cooperative in the South has provided initiative to increase the quality of seed through genetics. Virginia has extensive first generation orchards which are producing small amounts of seed. Because of weather factors, there is a need to locate second generation orchards in the deep South. This should increase the quantity and quality of seed and provide improved seedlings to Virginia's landowners. Present supplies of seed will only meet the 1980 reforestation needs.

Timber Management.

– Site preparation - The removal of 2,4,5-T and restrictions on prescribed burning continue to have a serious effect on economically preparing land for reforestation. Additional limitations and increased costs will be imposed by water quality legislation. Total utilization of timber stands when harvested would greatly reduce the need for site preparation.

– Pine release - Selective spraying of young pine stands with herbicide to inhibit the growth of unwanted hardwoods has been virtually eliminated. The ban on use of 2,4,5-T halting the annual spray release of an estimated 20,000 acres of existing stands will result in an annual loss of $1.5 million in reduced growth, product value and services. The additonal loss resulting from inability of landowners and industry to carry out site preparation work for reforestation, or the reluctance of private landowners to consider reforestation with the problems imposed by the ban, could make the economic impact many times greater.

– Hardwood timber - Stand improvement requires the removal of unwanted species, and poorly formed, diseased or otherwise undesirable trees to permit improved growth of selected trees. A

market using small sized hardwood can provide an incentive for this practice.

– Increased intensively managed forest land - The largest gains in increasing wood production can be made by returning non-productive or cutover forest acres to a condition in which they approach their production potential. Hardwoods are replacing pine on approximately 53,000 acres annually, thus, creating further reductions in pine timber.

III. FACTORS AFFECTING THE PROFITABILITY OF FARM AND FOREST LANDOWNERS

Economic Concerns of the Private Forestland Ownership .

Information in Section I of this Appendix stated that 77 percent of the forestland in Virginia is owned by the private sector, other than the forest industry. Most of this land is held by private individuals, family groups or small corporations. The profitability of land use is a critical factor in determining future use of the land. Numerous factors relating to timber value at a specific location are also quite important. Land-use considerations and value factors are:

Ownership Objective	Value of Timberland
Farm enterprise	Productive capacity
Forest investment	Geographic location
Land speculation	Distance from market
Recreation	Terrain
Wildlife or fish	Accessibility
Retreat or retirement	Alternative land use
Product Value	**Future Investment**
Species	Value of past crop
Size	Cost of reestablishment
Competition	and maintenance
Market availability	Rate of return
	Incentive alternatives
	Taxes

Taxation.

Ad Valorem Tax on Forest Property - Urbanization has increased the demand for government services. This demand has resulted in increased property tax levies for people-related activities rather than land-related local services. The land-use assessment form of property tax has provided some relief to landowners from burdensome taxation and helps slow the sale of agriculture and forestland near urban areas where competition for land is greatest.

The value of agriculture and forests to the community must be recognized by governing bodies to provide incentives for adopting methods that will preserve these land uses.

Recognition of the value of intensive timber production to the State's economy was demonstrated in the enactment of the Reforestation of Timberlands Act of 1970.

An incentive to increase production would be to allow timber receipts of small woodland operators to be pro-rated over a number of years, thus spreading out income from a long-term crop.

Cost of reforestation occurs in long-term intervals on an acre of forestland. Site preparation and reforestation costs could be deductible from Federal and State income taxes. This would provide incentive for owners to do the work in the same year or immediately after selling timber.

Production Value.

Pine sawtimber prices, averaging $81.25 per MBF statewide, doubled from 1968 to 1978 while pulpwood prices increased 23 percent, from $6.50 to $8.00 a standard cord. The increased value of structural timber and greater utilization of chip residues have accounted for higher sawtimber values and a reduced demand for roundwood.

Average sawtimber price for National Forest pine timber in the south was $148.27 per MBF in 1978, 82 percent higher than that received by Virginia landowners. Pipe pulpwood at $12.42 per cord for the National Forests was 55 percent greater value.

These differences reflect some of the problems in making the forest investment profitable for private landowners. Return on investment at present Virginia prices is less than for alternative

opportunities with long term capitalization and the attending risks.

External Forces Affecting Profit Margins.

Laws, regulations and programs have widespread effects on the profitability of forest enterprises. Most have positive effects and are necessary to provide incentives or to protect some element of society or a natural resource. A detailed discussion of the major laws is contained in Appendix B.

By far, the greatest number of laws and regulations affecting forest and forestry activities deal with the environment or conservation of natural resources. The environmental laws have tended to increase the cost of forest operations and compliance with restrictions imposed by one law can create serious problems with other regulations. For example, the effect of banning 2,4,5-T in controlling unwanted woody vegetation and the restrictions limiting prescribed burning will no doubt significantly change land preparation methods for reforestation. These changes will likely result in use of heavy equipment on more acreage with increased soil disturbance. This cause and effect relationship can increase the cost of reforestation, create additional water quality problems and result in lowering productivity through soil alterations. It is extremely important to consider long-term impacts resulting from environmental legislation.

Timber Markets and Product Marketing.

The price structure of forest products has historically been controlled by product uses. Large, good quality hardwood sawtimber and hardwood veneer have commanded and will probably continue to command good prices, because supply is limited and demand is great.

Small pine timber has generally been desirable, but the relative value has traditionally been low in comparison with sawtimber as more than an adequate supply has been available. The advent of chip-n'-saw mills, bolter saws, gang saws and other equipment developments has provided greater demands for smaller sized material and prices for this material have risen.

Small hardwoods have been useful for various speciality products, pulp for paper products and fuel wood. The supply, however, is considerably greater than the demand so the price has been low and continues to be lower than other wood products.

Changes in technology have enabled large supplies of hardwood to be used by the pulpwood industry to replace the more expensive and diminishing supply of pine.

Markets - An indication of the basic market problems in the state is shown in Chart No. 4. Briefly stated, the problem is a much higher demand for pine than for hardwood timber. Total removals of hardwood in 1966 were three-fourths of the growth as compared to one-half in 1976. When the data are analyzed by region, the Mountain Region shows removals of only 33 percent of the growth as compared to 54 percent in the Piedmont and 69 percent in the Coastal Plain.

Basically, the market concern in the mountains is the lack of demand for small hardwood. Quality sawtimber sizes make up too small a percentage of the total to make logging economically feasible. The economics are aggravated by:

- steep terrain
- poor access
- cost of road construction
- low volume of timber per acre

The market concern in the Piedmont and Coastal Plain is economic, i.e., low value and insufficient demand for small hardwood. Much of the surplus growth in these regions would be utilized in present logging operations if markets were available. Many hardwoods are now commanding a value high enough for buyers to separate products for different uses, but many of the small and low value hardwoods cannot be handled economically.

The demand for pine timber is relatively high in the Coastal Plain and Piedmont Regions. The Mountain Region receives less attention because of the lower volume per unit of area and consequently lower economic return. The present sawtimber deficit in the Coastal Plain will continue for several decades with increased demand reaching further into the Piedmont and Mountain

regions. The primary portion of the pine resource that is not being used is the small trees or tops of large trees left after logging. Wood for industrial energy could use much of this resource.

Marketing - In the past, most timber stands have been sold by lump sum rather than marketed by product. The selling of trees on the stump for sawtimber or pulpwood is the accepted method of transfer. The veneer market for quality hardwood used in the domestic and foreign manufacture of furniture has provided the impetus for marketing timber products. All grades of pine and hardwood products can now be marketed with quality being the determinant of value, however, market availability continues to be a problem in many areas.

A potential exists and is being researched at Virginia Polytechnic Institute and State University to determine the feasibility of timber concentration yards. Many forest industries act in this capacity today as they separate their products for highest and best use. Concentration yards at key locations would allow landowners to take advantage of the market for highest value timber products. This would provide an opportunity for a landowner to market his own products or work through a logging contractor to increase his return on investment.

The energy crisis has provided another marketing possibility for the landowner. Sales of wood for fuel would provide an opportunity for the landowner to increase his income from his forestland and at the same time provide an incentive for him to remove top wood and weed trees not used in logging operations and to thin hardwood stands by removing low quality trees. One of the primary constraints at present is the landowner's liability for accidents occurring on his property if he allows or sells fuelwood to be cut by individuals. This can be corrected by action of the General Assembly to provide exemption from landowner liability in the use of forestlands.

Export of Forest Products - The South is currently assessing the opportunity of forest products export. The School of Forestry and Wildlife Resources, Virginia Polytechnic Institute and State University, has entered into a cooperative agreement with the U. S. Forest Service to "to review foreign trade in southern forest products for the purpose of identifying the principal problems needing study and their relative importance." The following areas have been tentatively identified in this study:

- Changes in price structure and the growing cost of raw materials in timber-scarce countries are making the low-value-to-weight-ratio forest products more profitable.

- The nations of the world have achieved an interdependence which increases the competition for products.

- Pulp, paper and paperboard dominate forest products exports from the South.

- A modest amount of solid wood products, including southern pine lumber, hardwood lumber and roundwood in the form of hardwood veneer, are exported.

Problem areas include:

- Lack of information of foreign markets and trends

- Locations and technical specifications of the market

- Size and competitiveness of the market

- Port and transportation facilities, services and costs

- Steps in exporting

Transportation.

Rail - The forest industry experiences difficulty in obtaining and scheduling rail cars. Loaded cars are often delayed, compounding the limitations of short sidings. The rail industry is abandoning infrequently used short sidings. The forest industry believes that the low usage is caused by the car shortage and primary manufacture is affected more than secondary.

Highway - The forest and transportation industries agree that revision of the maximum weights and length limit would reduce energy use and improve efficiency. The temporary limits of 80,000 pounds gross and 60 feet maximum length provided by executive order of the Governor should be made permanent.

Pine Reforestation.

The 1975 Resources Planning program [1] projected needs through the year 2020 indicating a doubling of timber needs. The report also identified the South as the primary region of the country to increase and supply as much as 50 percent of the Nation's timber needs from its non-industrial private forestland.

Virginia has always had a progressive approach to forest management by industry and the private forest landowner alike. The Reforestation of Timberlands Act beginning in 1971 rapidly increased the reforestation of pine timberlands. The fairly constant average project size indicates the use of the program on small acreages by the small private landowner. The Federal Incentives Program (FIP) increased the payment rate to 75 percent and became well established by 1975, causing a decline in the RTA. The Federal program has two attractive provisions for the private owner. First, the FIP cost share rate is based on 75 percent of actual or average project cost with a $90.00 per acre maximum payment rate compared to 50 percent and $60.00 maximum for RTA. Secondly, the owners may receive cost-sharing payment when portions of a project have been completed.

The two programs complement each other quite well, but a single payment rate would give all landowners an equal incentive opportunity. Chart No. 6 shows the reforestation accomplishments in Virginia.

The Virginia Forest Productivity Report sponsored jointly by the Forest Industrial Council and the Virginia Forestry Association identified the need to improve productivity on 6.8 million acres of the commercial forestland base of which 85 percent is on private non-industrial lands. The basis of this improvement is the current growth as compared to the potential of the land. The growth and number of acceptable, well distributed, free-to-grow trees is considerably improved with intensive reforestation and cultural practices.

Utilization of Low Quality Hardwoods.

Opportunities and needs of forestry go far beyond the opportunities for increasing growth of wood to serve as a raw material. The use of those materials in industry, the manufacture into products, transportation and sales offer tremendous opportunities to Virginia and the landowners supplying raw materials.

Increasing Use As Sawtimber.

Inventories of hardwood timber in the Commonwealth indicates that growth exceeds removal. The total volume of standing timber is increasing. However, the quality of this resource is declining. The standing hardwood timber is characterized by low-grade, small diameter trees. The continued demand for quality hardwood lumber is increasingly difficult to meet, and inventories of lower grade lumber are becoming difficult to market.

The furniture industry would benefit most significantly from the improvement in utilizing low-quality hardwoods. That industry in Virginia ranks second among the states in the U. S. and contributes substantially to the economy of the Commonwealth. This industry operates in a highly competitive market economy and requires on-going technological and economic assistance. A program specifically designed to increase the use of hardwood as sawtimber will directly affect the furniture industry. Such a program will also enhance the value of the timber on the properties of small landowners.

Pallets and Containers.

The wooden pallet industry is an important wood-using industry. It consumed over 10 percent of the national lumber production in 1972, 15 percent in 1977 and 17 percent in 1978. The consumption in 1978 amounted to a total of 6.5 billion board feet of lumber converted into a product value of over $2.0 billion.

Virginia is the second largest pallet producer in the U. S. The Commonwealth exports large

quantities of pallets as far as Chicago and Boston. The industry is based on low-quality hardwood and is well fitted to the available surplus hardwood timber in Virginia. In fact, a potential exists in the Commonwealth for a doubling of pallet and container production. Through promotion of pallet manufacturing and support of the small manufacturers, the income from the privately owned timber land will also be increased.

Harvesting.

A large percentage of the cost of raw materials to the wood products manufacturer installation is the cost of harvesting and transportation of wood. In many instances, useable material must be left in the woods because cost of harvesting and transportation exceed the value to be realized from its sale. Unconventional harvesting techniques including whole-tree chipping, baling of small materials, and whole tree logging are now in various stages of development and use. However, research is needed in technological development and in economic feasibility of the new harvesting methods.

Wood Fiber Products.

The complete utilization of avaliable forest resources requires that manufacturing residues be economically converted into useful products. At present levels of technology, the highest value use for many of these manufacturing products is for paper and paperboard products. Sawdust, shavings, trimmings and bark may be useful, however, in low-grade particle board, a higher value use. Development of such technology would increase income to both manufacturers and landowners and relieve pressures on solid wood products.

Technology for Under-utilized Hardwoods.

Opportunity for expanded use may be realized in several ways. 1) Use in boltermills and small sawmills to recover quality furniture parts from portions of currently unmerchantable trees. 2) Use of low grade material for pallets. 3) Increased production of railroad ties. Currently, trends in transporation indicate a widespread reconditioning of railroads. In this event, need for billions of railroad ties offer markets for currently unuseable materials. Such use offers addtional dividends in making conversion of poor and mediocre hardwood stands to higher value timber since costs of conversion will be at least partially offset through sale of currently unuseable material. Each of these markets must be developed through increased research and continuing education. Completion of the wood products laboratory at Virginia Polytechnic Institute and State University is needed for this effort.

Wood for Energy

Alternative Uses to Replace or Supplement Fossil Fuels - The increased cost of petroleum-based fuels has placed wood and other fibrous materials in competition for heating energy. Although grains are becoming increasingly competitive for alcohol fuel derivatives, distillation of wood continues to be cost prohibitive.

The Office of Emergency and Energy Resources has overall responsibility for development of alternative energy supplies in the state. The State Forester has been designated to coordinate and provide leadership in "wood for energy" uses. Virginia Polytechnic Institute and State University is providing basic research and extension education.

The primary thrust of wood use for energy appears to be for industrial fuels where some form of shredded or chipped wood product is used to fire an approved energy system. Manufactured pelletized wood and fiber wastes are used for industrial heating and roundwood for home heating.

Industrial Use of Wood for Fuel - The forest based products industry currently derives 40 percent of its energy needs from wood residues. The conversion of petroleum systems to wood systems is increasing.

Other industries such as brick manufacturers have found wood sawdust to be a superior heating and a lower cost fuel. Many industries are studying wood heating alternatives. The primary considerations are:

- Cost of conversion to wood system.

- Availability of wood in useable form.

- Continuous supply of raw materials.

- Cost of wood as a fuel.

Manufactured Wood Pellets - Plants are established in North Carolina, Maine and Tennessee as well as other areas to produce wood pellets for heating industrial boilers or as a direct heat source. The pellets are made by reconstituting ground wood residues. The primary questions of feasibility are:

- Raw material source.

- Energy efficiency (cost of producing and transporting pellets as compared to direct use of wood).

- Effect of drain on forest resources.

- Profitability.

Raw Wood for Home Heating - A dramatic increase in home wood-heating devices has placed a new demand on wood products in some areas of the state. The demands have increased the use of logging residues and have stimulated timber stand improvement practices in hardwood forests. The market for small low quality hardwoods that this use provides is needed in most areas of the state. Factors that need to be addressed to fully utilize this program as an energy alternative and a forest improvement practice are:

- Education of users.

- Education of producers.

- Method of bringing buyer and seller together.

- Identification of products for fuel use to protect

valuable timber growing stock.

Program Support for Wood Energy

Research - Projects being conducted at Virginia Polytechnic Institute and State University, School of Forestry and Wildlife Resources are:

- An integrated investigation of procurement harvesting, drying and transporation of woody biomass for fuel.

- The effects of outdoor storage on the fuel potential of green hardwood residue.

- A preliminary investigation of energy input-output relationships for loblolly pine stands.

- Weights and volumes of Appalachian hardwood.

- Guides for decisions on energy sources for pulp and paper mills.

- Determination of heat value content of various tree species.

Areas Identified as Needing Further Investigation.

- The energy variability of species in relation to site.

- The degradation of site and need for fertilizer with biomass removal over time.

- Availability of wood fuel from hardwood timber stand improvement.

Education

- Media funding.
- Consumer listing service for firewood.
- Brochures.
- Demonstrations and seminars.

Operations

- Technical service personnel.
- Feasibility studies on equipment needed to convert from present systems to energy systems.
- Funding of pilot projects in industry, commercial buildings or state buildings.

[3] Source: The Renewable Resources of the South, a recommended program through the year 2020, USDA, U. S. Forest Service. SA.

V. SPECIAL ISSUES

Land-Use Planning.

The need to preserve agriculture and forestland is increasing in some areas. Population pressures ultimately require some type of zoning to control land uses. Enactment of Land-Use Assessment and Agricultural and Forestal District Acts are attempts to deal with land use.

Land-use assessment does not in itself preserve land as was pointed out by the legislative study on taxation during 1978-79. The voluntary nature of this Act provides a means for landowners and county governments to maintain a productive resource that is vital to the local, state and national interest. Forestal districts will provide additional protection against unrestricted development or condemnation.

Federal Support of State Programs.

The federal government has provided support for many programs to improve and protect the forest resource in the state. Federal funding for basic programs of forest fire and forest management assistance is being reduced. New programs on timber utilization, forestry extension, forest resource planning, research and urban forestry have been initiated or expanded. State funding of these programs must address changes to meet congressional action that alters support allocations.

Recent federal government actions have shown a tendency to reduce or eliminate much of the support in favor of the state assuming more of the responsibility.

Specific federal laws providing for assistance through the Secretary of Agriculture, U. S. Forest Service are:

- PL 95-306 - Renewable Resource Extension Act of 1978 provides for types of programs and eligible colleges and universities.

- PL 95-307 - Forest and Rangeland Renewable Resources Research Act of 1978 provides for authorization, cooperation and competitive grants.

- PL 95-313 - Cooperative Forestry Assistance Act of 1978, complementing the Forest and Rangeland Renewable Resources Planning Act of 1974, provides for rural forestry assistance, forestry incentives, insect and disease control, urban forestry assistance, rural fire prevention and control, and planning assistance.

Forest Industry Support of State Programs.

The forest industry has demonstrated its support for state programs by providing matching funds for the Reforestation of Timberlands Act of 1970 through an increase in the forest products tax on pine species. This cooperative assistance has significantly increased the reforestation activity of the private landowners in the state. Equalization of the state program with the federal program at the 75 percent support rate is needed.

Forest Research in Virginia.

A summary of forestry research by state funding has recently been compiled by USDA. Scientist-man-years spent on forestry research in Virginia is low when compared to other states. Virginia is ranked among the lowest states in both number of scientist-man-years and total dollars spent on forestry research. The average for the thirteen southern states, including West Virginia, was 2.1 million dollars per year, with an average of 30 scientist-man-years time expended. The total expenditure for Virginia was $806,643. Approximately one-half of the amount spent in Virginia was non-Federal funds and approximately one-fourth was State appropriated money. Adjacent states, such as West Virginia and North Carolina spent three to five times as much as Virginia. West Virginia had 36 man-years of effort on research and North Carolina had 51 man-years compared to 11 man-years for Virginia. In terms of total dollars spent, West Virginia spent 2.3 million dollars and North Carolina spent 3.7 million dollars.

In 1972 the total contribution of stumpage and the value added by manufacturers of lumber and

wood products, furniture, paper and allied products, was $913 million. Less than 1/10 of 1 percent of the value of the forest products in Virginia was spent on research. This 1/10 of a percent is comparable to an average of 2.4 percent that is spent on research and development for all industries.

Research information is vital to maintaining a competitive forest products industry in the State. Consequently, increasing the expenditures for forestry research in Virginia should be one of the major goals of forestry interests in the State.

VI. SUMMARY OF LEGISLATIVE NEEDS AND SUPPORT

Cost Share Assistance.

The Federal Forest Incentive Program (FIP), Agriculture Conservation Program (ACP) and the State Reforestation of Timberlands (RT) programs are available to share the cost of practices necessary to return privately owned woodlands to full production. The State Forester has determined that pine reforestation in the amount of 100,000 acres per year is needed to maintain Virginia's forest economy. To reach this goal, action should be taken to:

- Equalize the cost-share rate so that both RT and FIP are cost-shared equally. Presently FIP cost-share is at a higher level of funding per acre than is RT.

- Increase the funds available for cost-sharing through the RT program by increasing both the forest products tax and allocations from the general fund to support the increase. This increase is contigent on the program response in 1980.

Taxation.

- Provide timberland owners with an income tax provision that would allow a deduction for reforestation and timber stand maintenance costs.

- Permit pro-rating income from timber sales over at least a three year period. The long term aspect of timber provides periodic income that would be more fairly taxed over a period of time rather than one lump sum.

- Develop ad valorem taxation policies to encourage landowners to retain their property as forestland. Urbanization forces landowners to consider land use alternatives when use value taxation is not available. The state must consider the value of its agriculture and forestland as a productive entity in comparison with continued loss of land, lowering production potential.

- Prevail, at every opportunity, upon Federal officials to repeal the new "carryover basis" in computing estate taxes and return to the old basis of fair market value at time of death.

Energy and Hardwood Utilization.

The increased cost of petroleum-based fuels has made wood and other fibrous materials competitive for heating and production energy. Several considerations concerning the availability and continued supply of wood for industrial energy and home heating systems are needed. Use of small hardwoods and waste logging residues would improve utilization and stand management of the hardwood type. Support for research in hardwood utilization and development of "wood for energy" is needed in the following areas:

- Support research programs designed to facilitate and expedite uses of wood residues and small hardwood for new or expanded markets for hardwood products and energy.

- Provide legislation that will release the landowner from liability to injury of individuals purchasing or permitted free removal of wood for home heating use.

- Support programs designed to educate, advise and assist the public in wood heating.

- Support "pilot programs" to assist cooperators in converting to wood energy systems.

Transportation.

- Support to increase existing limitations on major highway transport to a maximum of 80,000 pound gross weight and 60 feet total length. A permanent change would save energy and lower costs of transportation.

Forest Protection, Forest Management, Urban Forestry and Forest Resources Planning.

The Federal government provides funding support for forestry assistance. Recent proposals by

the President are expected to decrease the support for fire protection and urban forestry assistance. The Division of Forestry places high priority on these areas to carry out this mission. Loss of these funds would cause program reductions at a time when emphasis is being placed on resource management.

- Support is needed to maintain or increase the present level of funding by both the state and federal governments.

Forestry Education and Extension.

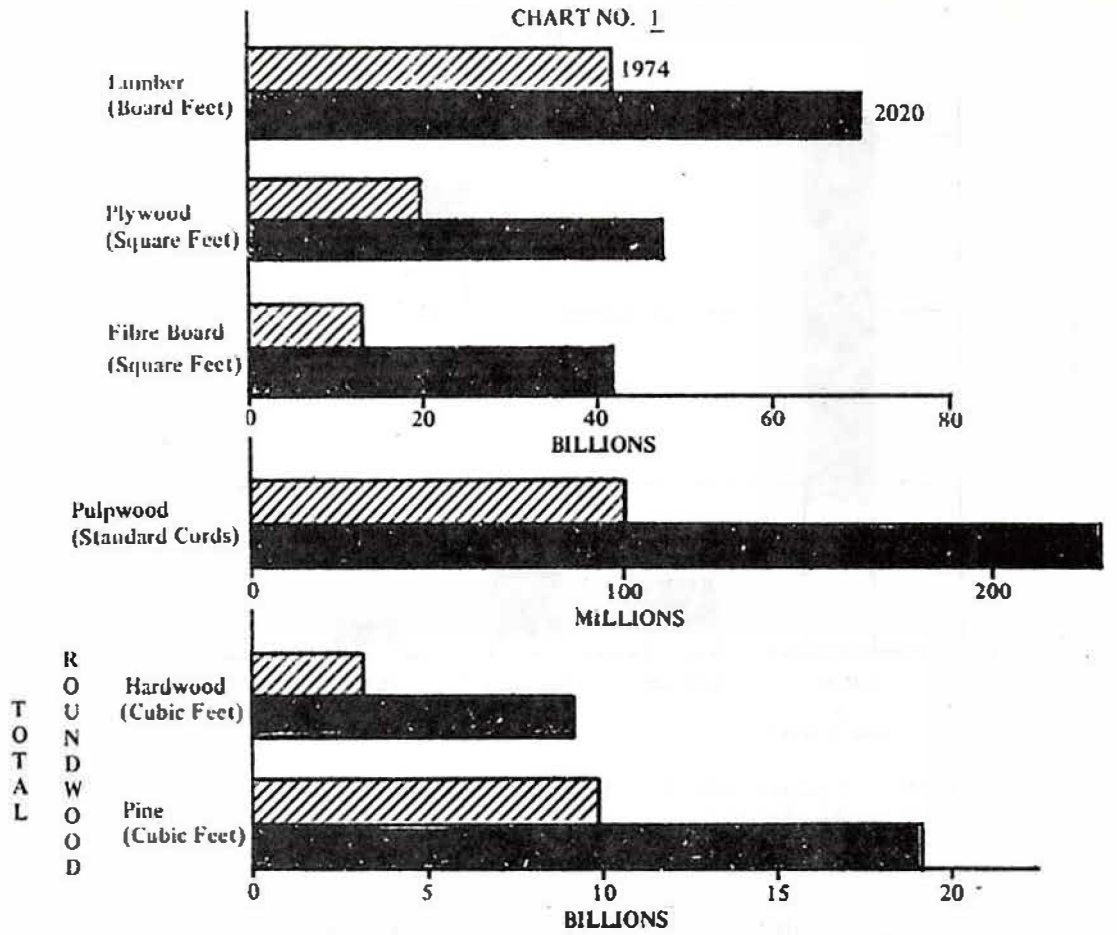
- Increase funding and support for use of television and mass media methods. Reduction in operating budgets have not allowed for the increased costs of such programs. Many persons living in urban areas have little contact with forestry programs, therefore, have limited understanding and little interest in forest resource values.

Chemicals.

- Provide support and guidance for the reinstatement of 2,4,5-T or the development of a replacement herbicide for use in forest management. Many of the alternatives to chemicals are more expensive and cause soil disturbance.

PROJECTED DEMAND FOR WOOD PRODUCTS BY YEAR 2020

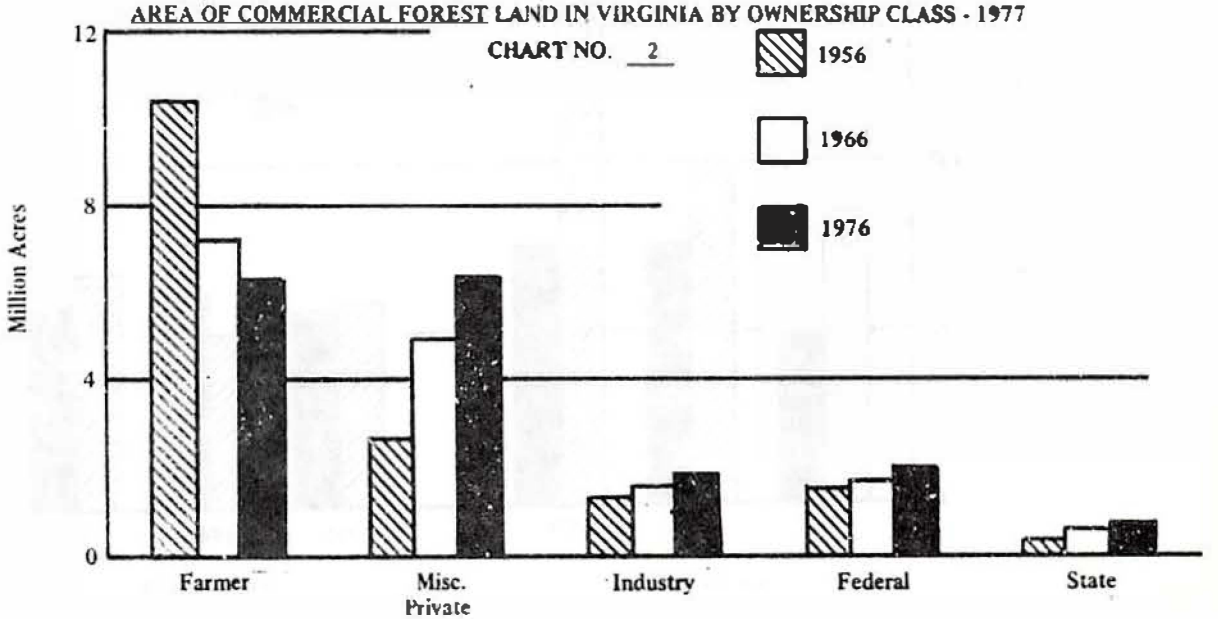
CHART NO. 1



SOURCE: The Nations Renewable Resources - Assessment 1975
Forest Resource Report No. 21
USDA - Forest Service

AREA OF COMMERCIAL FOREST LAND IN VIRGINIA BY OWNERSHIP CLASS - 1977

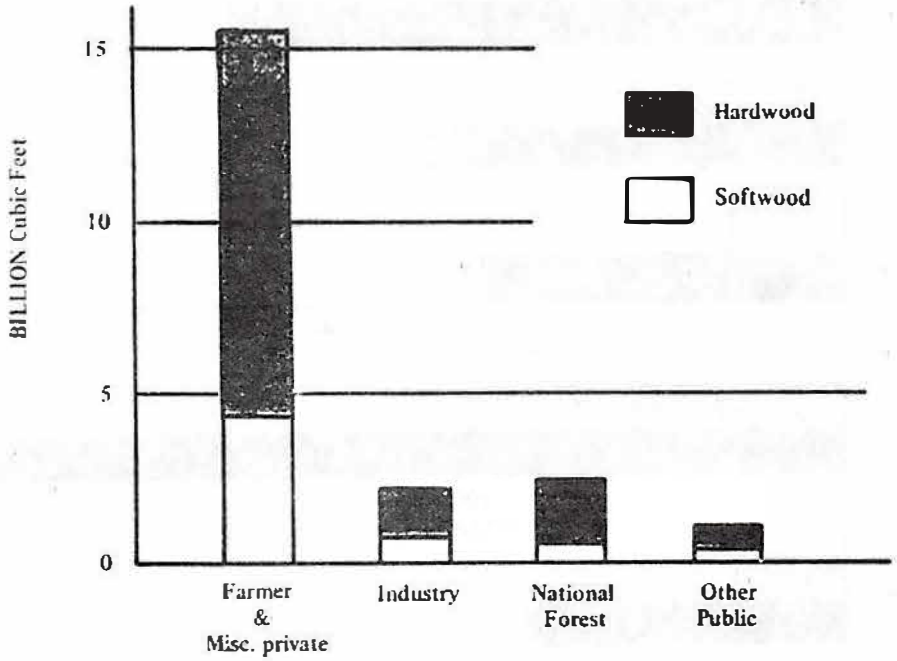
CHART NO. 2



SOURCE: Virginia's Timber 1977, USDA, Forest Service Resource Bulletin SE-44

VOLUME OF GROWING STOCK ON COMMERCIAL FOREST LAND IN VIRGINIA
BY OWNERSHIP CLASS - 1977

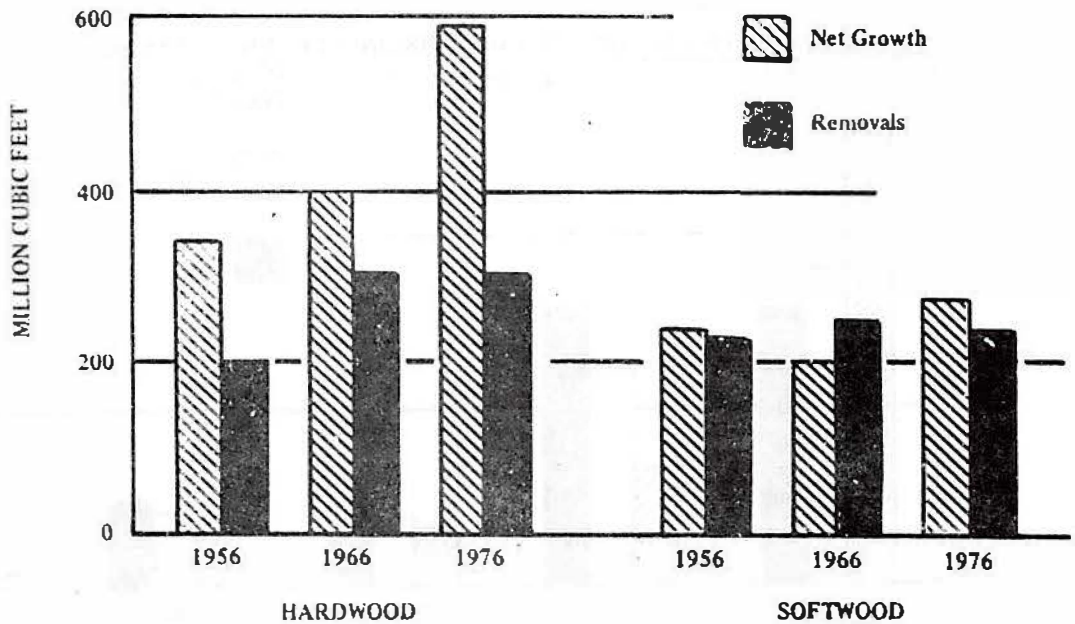
CHART NO. 3



SOURCE: Virginia's Timber 1977, USDA, Forest Service Resource Bulletin SE - 44

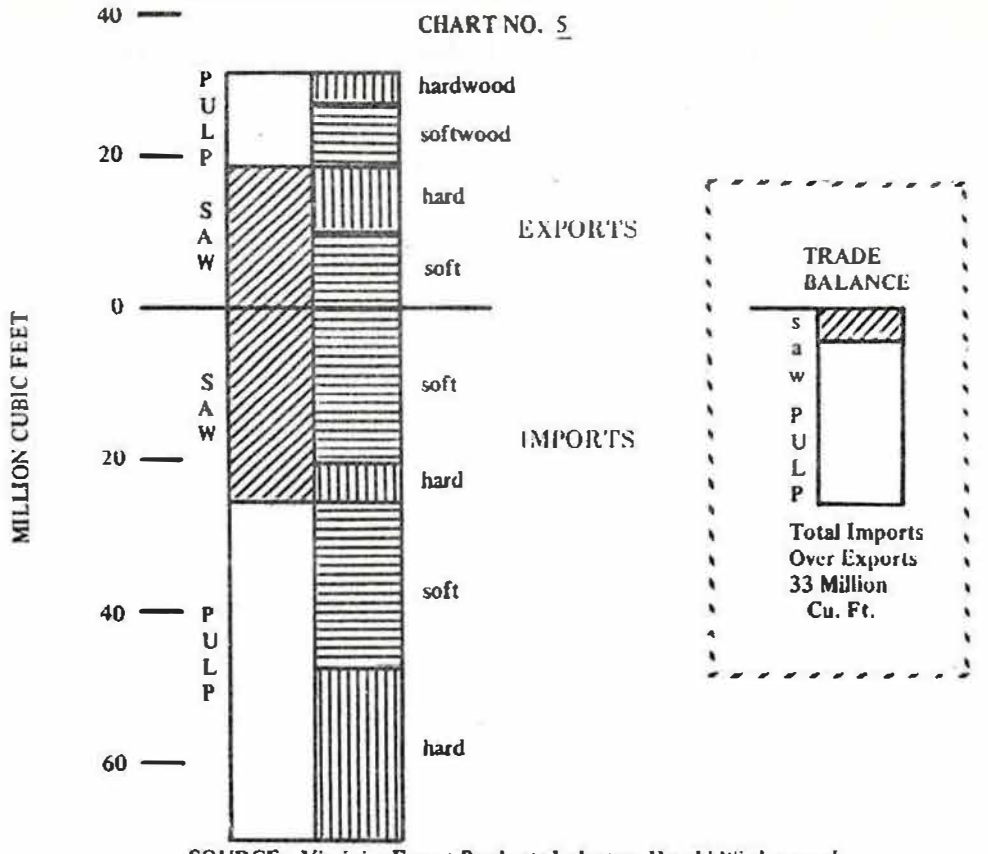
TRENDS IN NET GROWTH AND TIMBER REMOVALS
IN VIRGINIA BY TYPE AND YEAR

CHART NO. 4



VIRGINIA'S BALANCE OF TRADE IN WOOD PRODUCTS

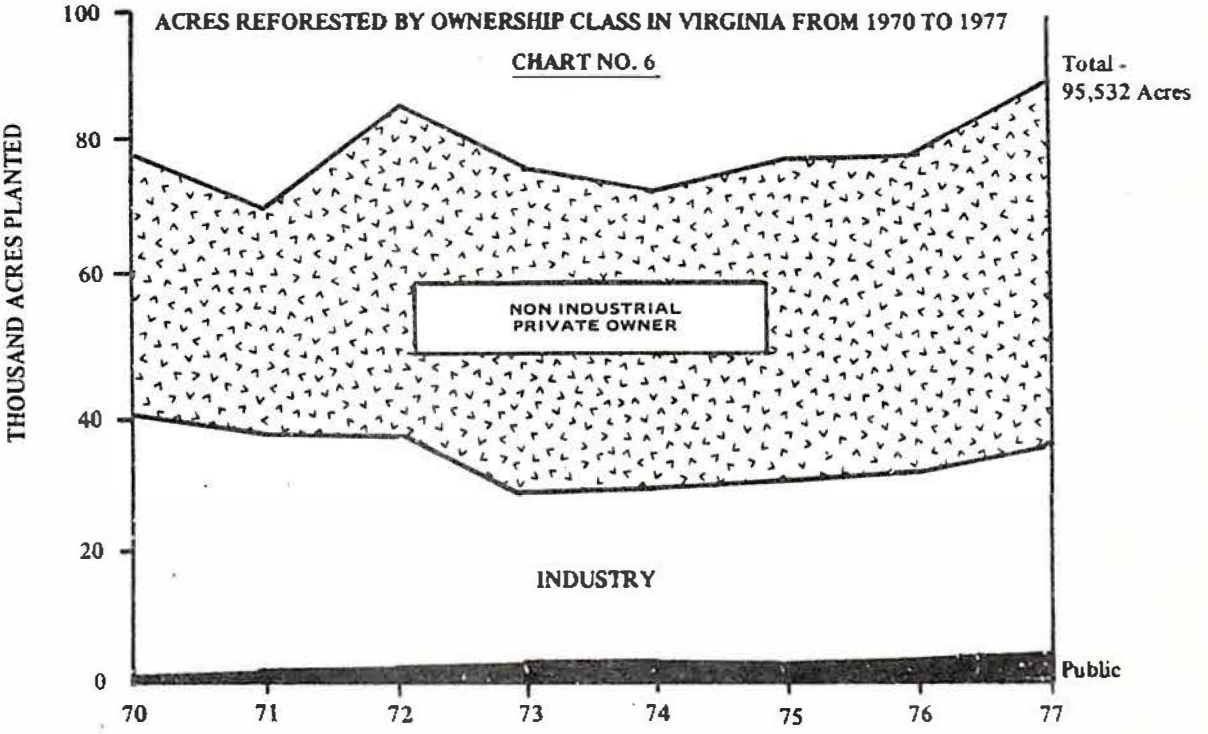
CHART NO. 5



SOURCE: Virginias Forest Products Industry, Harold Wisdom and Timothy D. Hudspeth, VPI & SU FWS - 3 - 78, June 1978.

ACRES REFORESTED BY OWNERSHIP CLASS IN VIRGINIA FROM 1970 TO 1977

CHART NO. 6



Appendix E

Farm Profitability Survey With Model and Composite Responses

VIRGINIA DEPARTMENT OF AGRICULTURE AND CONSUMER SERVICES
203 North Governor Street, Richmond, Virginia 23219

SURVEY OF FINANCIAL PROFITABILITY AND RELATED PROBLEMS OF VIRGINIA AGRICULTURE, DECEMBER, 1978

(Make corrections in name and/or address in space provided above.)

Dear Virginia Farmer:

The 1978 session of the Virginia General Assembly established the Virginia Agricultural Opportunities Commission. This Commission will look at ways to improve Virginia agriculture, including forestry.

One of the specific duties of the Commission is to identify factors affecting the profitability of different types of farming and forestry operations. We need your assistance in determining the strengths and weaknesses associated with the profitability of farming.

I would appreciate your taking the time to complete and return this questionnaire to us in the attached self-addressed envelope not later than December 18, 1978. The future profitability of Virginia agriculture is very important to all Virginians and we need your help to find ways for assisting the operation of our free market agricultural economy.

Thank you for you cooperation and assistance.

Sincerely,

Frank W. Nolen
Member of the Senate
Chairman, Subcommittee on Finance and Profitability

Dear Virginia Farmer:

I firmly support the efforts of the Agricultural Opportunities Commission to find effective ways of strengthening agriculture--Virginia's largest and most important industry. Your response to this questionnaire will help all of us make this important industry more viable in the future.

All the information you provide in this survey is considered confidential and will be consolidated with data received from other respondents into a summary form.

I appreciate your cooperation and look forward to receiving your completed questionnaire on or before December 18, 1978.

Sincerely,

S. Mason Carbaugh
Commissioner
Virginia Department of Agriculture and Consumer Services

Answers to the questions that follow should relate to your 1978 farm operations.

This report should be completed by the operator of this farm operation.

This is a sample survey covering approximately 1700 farms throughout Virginia. Please complete and return this form to assure that the summary information has a high level of value as an input to the Commission's study.

1. What was the size of your 1978 farming operation?

(1) land owned and operated by you	256.21	acres
(2) land rented or leased from others	96.57	acres
(3) land managed by you for others	18.51	acres
(4) total land in this operation	372.0	acres
	(1)+(2)+(3)=(4)	
(5) how much of item (4) is woodland	103.45	acres

2. Do you class this farm operation as:

In answering this question, consider all the land you own, rent, lease or manage as a part of your farm operation.

Check one of the following:

*By Percent	
(85)	a family farm
(10)	partnership
(3)	corporation
(2)	other _____ (define)

3. Now considering the farming operation only, what was the major source of income from farming in 1978:

Please check the one that best applies to your farm operation:

*By Percent			
(57)	cattle and calves	(2)	peanuts
(14)	dairying	(9)	grain crops (small grains, corn, soybean and sorghum grain)
(6)	hogs and pigs	(1)	vegetables (include potatoes and sweet potatoes)
(1)	sheep, lambs and wool	(1)	fruit
(1)	poultry (eggs, broilers, chickens, turkeys)	(1)	other _____ (name)
(7)	tobacco		

4. Sources of farm production for your operation in 1978:

(1) Crops

Kind of crop (give name)	Acres harvested and to be harvested	Total production (from the acres harvested and to be harvested)	Unit (bus., lbs., cwt., etc.)

(2) Livestock and livestock products sold in 1978:

Kind of livestock and/or product	Total production marketed and to be marketed in 1978	Unit (lbs., cwt., etc.)
Beef cattle and calves		
Milk and cream		
Milk cows, heifers, etc.		
Hogs and pigs		
Sheep and pigs		
Wool		
Horses and ponies		
Broilers		
Chicken eggs (include hatchery eggs)		
Chickens		
Turkeys		
Turkey eggs		
Honey and beeswax		
Other [(give name(s)]		

(3) Forest products sold and to be sold from this farm operation in 1978:

		Unit
Sawtimber	_____	bd. ft. sold
Veneer logs	_____	bd. ft. sold
Pulpwood	_____	( ) cord ( ) cwt.
Firewood	_____	Cords sold
Post, etc.	_____	( ) Number
		( ) Other _____ (name)

(3a) Do you have a written plan that you follow in management of your woodlands:

( ) yes ( ) no

5. Considering this farm operating unit, what will be the total income from all sources (farm and non-farm in 1978?)

Read this before reporting on questions.

Income from all sources should include that from the sales of all farm commodities including forest products and nursery and greenhouse plants. You should also include income from government payments, custom work, earnings from off-farm employment by you and all family members, rental income from dwellings, income from land rented or leased to others, interest income, stock dividends and income from all other sources. This should be the total gross income from all sources.

Please check the range that you think best applies.

1	$500,000 and over
4	200,000 - 499,999
11	100,000 - 199,999
7	75,000 - 99,999
6	50,000 - 74,999
11	30,000 - 49,999
11	20,000 - 29,999
9	15,000 - 19,999
12	10,000 - 14,999
14	5,000 - 9,999
14	under 5,000

6. Of the total income checked under question "5", what percent was from the agricultural production of this farm operation? 67% (give your best estimate)

7. Now that the profile of your farm operation has been covered, please answer the following:

Your age: 57.9 years old.

Your education: (Check the highest level attended) *By Percent

(24) Elementary school (48) High school (28) College

8. How many years have you been operating a farm? 31.1 years

9. How many years do you plan to continue farming? *By Percent

Check one: less than (5) 1 year (32) 1-5 years (30) 6-10 years

(15) 11-20 years (18) more than 20 years

10. What changes do you expect in your farming operation during the next few years?

a. Changes relative to the size of operation: Check one only.

*By Percent

(60) no change

(22) reduce size of operation

(18) expand size of operation

b. Changes relative to the type of farming: Check one only.

*By Percent

(70) no changes

(6) shift more to crops

(13) shift more to cattle

(4) shift more to hogs

(1) shift more to poultry (layers, broilers, turkeys)

(6) other (please specify) _____

_____

11. Do you consider your farming operation to be profitable for 1978? 68% yes; 32% no

12. How many years out of the past ten years did you consider your farming operation as a profitable enterprise? 4.9 years (give the number of years considered profitabl

13. If, in any year (or years) during the past ten years you did not make a profit, please give the main factor that kept you from making a profit. _____

(1)	Weather	(37%)
(2)	Low price commodities	(12%)
(3)	Cost/price squeeze	(8%)

14. What do you think are the three or four major problems facing your farming busines today? Begin with the most important.

(1)	Farm input costs too high	(56%)
(2)	Other	(10%)
(3)	Inflation	(8%)
(4)	Low selling price of farm commodities	(7%)

15. List some of the good features or advantages that you attribute to living on or operating a farm today. Begin with the most important.

(1)	Good environment/Place to live	(34%)
(2)	Self sufficient/Own boss	(20%)
(3)	Land appreciates in value	(1%)
(4)	Other	(1%)

16. What do you think is needed to improve the profitability of agriculture in Virginia? Discuss

(1)	Improve relationship of prices paid to prices received	(31%)
(2)	Improve agricultural markets	(12%)
(3)	Lower real estate taxes	(9%)
(4)	Less government intervention	(9%)
(5)	Other	(8%)

17. Considering your immediate community, rank the following as causes for agricultural land being converted into non-farm uses. (Use "1" as the item that you consider of highest importance and "2" as the next most important, then "3" and so on.)

(7) Construction of highways

(4) Development of housing units

(8) Construction of industrial parks

(2) Real estate taxes

(3) Low financial returns from farming

(6) Breakup of farms as a result of inheritance or probate procedures

(1) Lack of young adults to take over farm operations as a result of retirements, deaths, etc.

(5) Purchases of farmland tracts for non-farm uses, (commercial forestry, mineral rights, etc.)

( ) Other reasons (please explain).

18. List some ways that local, state and federal governments can aid in slowing the loss of agricultural land to non-agricultural uses in your community.

(1) Real estate tax relief	(23%)
(2) Enact measures to preserve agricultural land	(16%)
(3) Inheritance or income tax relief	(16%)
(4) Slow down housing	(12%)
(5) Improve farmers' income	(12%)

19. Your farm operation is located in N.A. County/city.

20. Do you have a telephone? (x) yes ( ) no

If yes, please give your telephone number. (Your telephone number will be helpful should we need to call you for clarification of some item.)

( ) N.A.
area code number

N.A.	N.A.
Reported by:	Date