REPORT OF THE DEPARTMENT
DEPARTMENT OF GAME AND INLAND FISHERIES
ASSISTED BY
VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY
VIRGINIA COOPERATIVE EXTENSION SERVICE
VIRGINIA DEPARTMENT OF AGRICULTURE AND CONSUMER SERVICES
UNITED STATES DEPARTMENT OF AGRICULTURE

Deer Damage in Virginia

TO THE GOVERNOR AND THE GENERAL ASSEMBLY OF VIRGINIA

HOUSE DOCUMENT NO. 19

COMMONWEALTH OF VIRGINIA
RICHMOND
1994

COMMONWEALTH of VIRGINIA

Department of Game and Inland Fisheries

November 30, 1993

TO: The Honorable Lawrence Douglas Wilder, Governor of Virginia and Members of the General Assembly:

House Joint Resolution 588, adopted by the 1993 General Assembly, directed the Department of Game and Inland Fisheries assisted by the Virginia Polytechnic Institute and State University, the Virginia Cooperative Extension Service, the Virginia Department of Agriculture and Consumer Services and the Animal Damage Control branch of the United States Department of Agriculture to "undertake a study assessing the extent of damage to crops, vehicles, property, and citizens of the Commonwealth caused by deer." In addition, HJR 488 requested that "the study shall make recommendations on the establishment of deer management plans by county or by physiographic region. As directed by the resolution, the recommendations contained in this report are based on "providing recreational deer hunting opportunities and population management to control damage caused by deer."

We have the honor of submitting herewith the report on the deer damage in Virginia.

Respectfully Submitted,

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REPORT OF THE

HOUSE JOINT RESOLUTION 588

DEER DAMAGE COMMITTEE

WILDLIFE DIVISION
VIRGINIA DEPARTMENT OF GAME AND INLAND FISHERIES

OFFICE OF PLANT PROTECTION
VIRGINIA DEPARTMENT OF AGRICULTURE AND CONSUMER SERVICES

COLLEGE OF FORESTRY AND WILDLIFE RESOURCES
VIRGINIA COOPERATIVE EXTENSION SERVICE
VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY

WILDLIFE SERVICES
UNITED STATES DEPARTMENT OF AGRICULTURE

PREFACE

This study was undertaken in response to House Joint Resolution 588 requesting that the Virginia Department of Game and Inland Fisheries, assisted by Virginia Polytechnic Institute and State University, the Virginia Cooperative Extension Service, the Virginia Department of Agriculture and Consumer Services, and Wildlife Services of the United States Department of Agriculture "...undertake a study assessing the extent of damage to crops, vehicles, property, and citizens of the Commonwealth caused by deer."

We wish to recognize the individuals of the study committee who contributed their time and expertise to this effort. The members of the study committee were: Robert W. Duncan, Wm. Philip Eggborn, Dr. Roy L. Kirkpatrick, Martin S. Lowney, and Dr. Jim A. Parkhurst. Technical advisors who contributed to this study were John A. Johnson and W. Matt Knox.

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EXECUTIVE SUMMARY

House Joint Resolution 588 requested "...that the Department of Game and Inland Fisheries, assisted by Virginia Polytechnic Institute and State University, the Virginia Cooperative Extension Service, the Virginia Department of Agriculture and Consumer Services and the Animal Damage Control Agency of the United States Department of Agriculture, be requested to undertake a study assessing the extent of damage to crops, vehicles, property, and citizens of the Commonwealth caused by deer." The resolution also specified that "...the study shall make recommendations on the establishment of deer management plans by county or by physiographic region."

The Virginia Department of Game and Inland Fisheries (VDGIF) established a Deer Damage Committee in April of 1993. This committee solicited input from state agencies and agricultural commodity producers regarding the economic impact of deer damage in Virginia. Based on presentations made to the Committee and other available data, the Committee estimated that the amount of agricultural crop damage and property damage caused by deer in Virginia in 1992 was approximately $11.4 million and $4.5 million, respectively. Additionally, the Committee concluded that reduction of deer herds primarily through harvest of antlerless deer by hunters is the most effective and cost-efficient method to manage deer damage to crops, vehicles, and property.

The Committee also determined that, although deer damage crops, vehicles, and property, Virginia's white-tailed deer population is a beneficial economic resource. Virginia deer hunters contributed approximately 140 million dollars to the state's economy in 1991. This figure does not include indirect economic multiplier factors or nonconsumptive and aesthetic values.

The committee also reviewed recent steps taken by VDGIF to liberalize deer seasons and thereby increase deer harvest. Deer kill has increased rapidly in recent years and biologists believe the population may actually be decreasing. Even more liberal regulations were implemented for 1993 and 1994.

The Deer Damage Committee offers the following recommendations:

Recommendation 1:

That the VDGIF continue to develop and refine a statewide White-tailed Deer Management Plan that establishes deer herd objectives by defined management unit(s).

Recommendation 2:

That the VDGIF consider, as needed, further liberalization of their current deer hunting regulations (e.g., season lengths, bag limits, license design, number of either-sex hunting days, bonus deer permits) and deer management programs (e.g., the Deer Management Assistance Program, Damage Control Assistance Program).

Recommendation 3:

That the federal and state land management agencies of the Commonwealth of Virginia be strongly encouraged to implement and/or expand deer management activities on lands under their supervision. The effect of a "no hunting" deer management strategy on some of these lands should be revaluated. This analysis should address the effect(s) of current deer management on (1) crop and property damage levels of adjacent landowners and the efficacy of their damage control efforts, (2) deer-vehicle collision rates, and (3) the impact that high deer herd densities have on native floral and faunal communities.

Recommendation 4:

That the VDGIF, in cooperation with the Department of Agriculture and Consumer Services, Virginia Cooperative Extension Service, and Virginia Farm Bureau consider developing a private land deer hunter access program.

Recommendation 5:

That the VDGIF, in cooperation with the Cooperative Extension Service, the Department of Agriculture and Consumer Services and the United States Department of Agriculture (APHIS) should be encouraged to pursue funds to produce educational materials regarding deer management and damage options.

STUDY DESIGN

The following people served as members of the Deer Damage Committee, established by the VDGIF.

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The Deer Damage Committee met four times, and their actions are summarized below:

First Meeting
May 6, 1993
Virginia Department of Game and Inland Fisheries, Richmond, VA

The first meeting was an organizational meeting that included a presentation on the VDGIF Deer Management Program.

Second Meeting
June 10, 1993
Tidewater Agricultural Experiment Station, Suffolk, VA

The second meeting was devoted to presentations about deer damage from selected representatives of Virginia commodity producers.

Russell C. Schools, Executive Secretary of the Virginia Peanut Growers Association

Dr. Paul F. Reese, Jr., Extension Agronomist - Soybeans, of the Virginia Cooperative Extension.

Also, Virginia Department of Transportation's 1992 deer-vehicle collision data were reviewed.

Third Meeting
August 13, 1993
Cheatham Hall, Virginia Polytechnic Institute and State University, Blacksburg, VA

The third meeting was devoted presentations about deer damage from additional commodity representatives.

Dr. Harlan White, Extension Agronomist - Forages, Virginia Cooperative Extension Service

Gregory W. Miller, nursery owner/operator Willow Tree Farms Inc., representing the Virginia Nurserymen's Association, Inc.

Clayton O. Griffin, Executive Secretary Virginia State Horticultural Society

Bill Freeman, apple orchard owner, Giles County, Virginia and Board Member, Virginia Farm Bureau Federation, representing himself

Dr. Tony Wolf, Extension Agronomist - Vineyards, Virginia Cooperative Extension Service

Fourth Meeting
September 7, 1993
Virginia Department of Game and Inland Fisheries, Forest, VA

The fourth meeting was devoted to presentations from:

Commander C. T. Carter and Jim Steele, Lynchburg Police Department, regarding deer damage and control within the City of Lynchburg.

David Horne, Director, Virginia Hunters For The Hungry.

The fourth meeting was also devoted to reviewing and editing the first draft of the House Joint Resolution 588 Legislative Report. Reports on harvest statistics, liberalization of hunting regulations, and deer damage control efforts of VDGIF were heard by the Committee. All collected information was discussed and recommendations were formulated.

INTRODUCTION

Because of heightened awareness of deer damage in Virginia, House Joint Resolution 588 was introduced and passed during the 1993 session. By April 1993, a committee including representatives from the VDGIF, Virginia Polytechnic Institute and State University, Virginia Cooperative Extension Service, Virginia Department of Agriculture and Consumer Services and Wildlife Services of the United States Department of Agriculture was established to study the extent of damage caused by deer in the Commonwealth and to make recommendations to the legislature on an appropriate course of action.

DEER DAMAGE ASSESSMENT

The Deer Damage Committee solicited input from state agencies and agricultural commodity producers regarding the economic impact of deer damage in Virginia. Representatives from Virginia agricultural commodities who were contacted to make a presentation before the Committee included producers of peanuts, soybeans, forage crops, nursery stock, and fruits. Damage estimates to vehicles and citizens were obtained from deer-vehicle collision data of the Virginia Department of Transportation, see Appendix VIII. These data are maintained on an annual basis for all reported deer-vehicle collisions on VDOT maintained roads. Deer damage to property in urban/suburban environments (e.g., damage to ornamental plantings and shrubbery and vegetable gardens) was not estimated. Based on presentations made to the committee and other available data, the Committee estimated that the amount of agricultural crop damage and property damage caused by deer in Virginia in 1992 was approximately $11.4 million and $4.2 million, respectively (Table 1).

Table 1. House Joint Resolution 588 Committee agricultural and property deer damage report.

Agricultural Damage		
Commodity	Reported Loss[1]	Reference
Peanuts	2.0	Appendix III
Soybeans	6.3	Appendix IV
Forage Producers	0.625	Appendix V
Nurserys	0.5	Appendix VI
Orchards	1.9	Clayton Griffin[2]
Vineyards	0.065	Dr. Tony Wolf[3]
Subtotal	11.39	
Property Damage		
Vehicles	4.2[4]	Appendix VIII
Subtotal	4.2	

[1] Amount in millions of dollars.
[2] Personal communication, unpubl. data, October 14, 1993.
[3] Personal communication, unpubl. data, August 13, 1993.
[4] Five year average, 1987-1991.

DEER BENEFIT ASSESSMENT

The Committee also determined that although deer damage crops, vehicles, and property, Virginia's white-tailed deer represent a beneficial economic resource. According to the 1989 VDGIF hunter survey, 55% of all hunter-days spent afield in Virginia were in pursuit of white-tailed deer (unpubl. data). The 1991 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation reported that hunter expenditures in Virginia were $255,882,000 million (U.S. Department of Interior, Fish and Wildlife Service and U.S. Department of Commerce, Bureau of the Census 1993). When results from these two survey are combined, current Virginia deer hunter expenditures are estimated to be at least $140 million ($255,822,000 X 0.55) annually. This figure only includes direct hunting expenditures and does not utilize an economic multiplier factor or nonconsumptive and aesthetic values.

DEER MANAGEMENT OPTIONS

The objectives of the VDGIF deer management program are to (1) provide as much recreational deer hunting opportunity as possible and (2) direct the population control as necessary to minimize crop depredation and deer-vehicle collisions. Deer management in Virginia acknowledges that deer herd density and health can best be controlled by regulating antlerless deer harvests (Hayne and Gwynn 1977). At the state level antlerless harvest objectives are established every two years by adjusting the bag limit and/or the number of either-sex day(s) regulations by county.

During the 1992 deer season a minimum of 200,446 deer were harvested in Virginia. This included 79,170 females or 39.5%. Deer harvests have risen steadily since 1923 when 793 deer were taken (Figure 1). Virginia's deer management program has been noted both for its success and simplicity. During the period 1973-1988, Virginia's deer management program sought to maintain the percentage of female deer in the total legal harvest at approximately 30% by increasing or decreasing the number of days of antlerless deer hunting days at the end of the general firearms season. It was observed that, when the percentage of does harvested did not exceed a certain percentage (30 to 40%), the total harvest in succeeding years either increased or remained stable (Virginia Game Investigations 1975).

Over the past four years, 1989-1992, the total statewide deer harvest and percent females in the harvest have increased dramatically in response to rapid liberalization of deer seasons, bag limits, and number of either-sex hunting days (Figure 1). In 1989, increases in the number of either-sex hunting days and season bag limit (from two to three deer per season) resulted in a 40% increase in the total harvest and an approximate 5% increase in percent females in the harvest (32.9 to 34.5%). Additionally, in 1991, an increase in the number of either-sex hunting days, and a shift of the first either-sex day to the first Saturday of the general firearms season, an increase in the daily bag limit (from one to two per day), and the adding of bonus deer permits resulted in a 25% increase in the total harvest and another approximate 5% increase in the percent females in the harvest (34.5 to 39.6%).

The statewide deer harvest is not necessarily directly correlated with the statewide deer population level. For example, the 75% increase in harvest from 114,562 deer in 1988 to 200,446 deer in 1992 does not represent a 75% increase in the statewide deer population. The increase in harvest was a direct result of liberalized harvest regulations designed to increase the antlerless deer harvest levels as a means to stabilize and\or reduce the deer herd. According to McCullough (1990) "...it is now well established that antlerless harvests inevitably result

in reduction of deer population size and simultaneously an increase in sustainable kill."

For the upcoming 1993 deer season, regulation changes have been made that will significantly increase deer hunting recreation and harvest opportunities. Although the general firearms season length has not been changed, either-sex day opportunities have been standardized across physiographic regions where possible and liberalized in most counties. An additional week also has been added to both the early archery and early muzzleloading seasons. Most importantly, for the first time, bonus deer permits have been made legal statewide on private land in unlimited number(s) providing private landowners with a liberal deer management option.

In addition to the standard county deer season regulations, the VDGIF has three distinct deer management alternatives. These programs are: the Deer Management Assistance Program, the Damage Control Assistance Program, and the Kill Permit System.

DEER MANAGEMENT ASSISTANCE PROGRAM

Initiated in 1988, the Deer Management Assistance Program's (DMAP) primary objective is to allow landowners and hunt clubs to work together on a local level to manage deer herds. Secondary objectives are to increase the VDGIF's biological data base and to improve communication between deer hunters, landowners, and the VDGIF.

Participation in DMAP is open to all landowners and hunt clubs in Virginia. To participate, a club or landowner must apply to their local District Wildlife Biologist prior to September 15. Approval of the application is at the discretion of the VDGIF. All new DMAP participants are required to collect biological data (weights, lower jaws, date of kill, etc.) from all deer harvested on their property for one hunting season prior to becoming eligible for DMAP tags. DMAP tags are issued on the basis of the cooperator's management objective(s), deer herd health, and deer herd density. Deer taken with DMAP tags do not count against the daily or season bag limit(s). However, only two DMAP tags may be used per hunter per day. DMAP tags are nontransferable and can only be used on the property for which they were issued. Tags may be used during any open season and are valid for only antlerless deer (females and male fawns).

DMAP participation varies by region of the state. Land ownership patterns (i.e., average tract size, access control, the relative amount of private versus public land), season length, hunt method, hunter attitude(s), and management objective(s) all influence regional DMAP participation patterns. Consequently, in 1992, more than 1/2 (51%) of the acreage enrolled in DMAP was

located in the eastern Tidewater Region. Conversely, less than 1/10 of the acreage enrolled was located west of the Blue Ridge.

Table 2. Status of the Deer Management Assistance Program in Virginia, 1988-1992.

	No. of Cooperators	Acres in Program	No. of Tags Issued	Deer Harvested
1988	56	253,596	960	
1989	97	451,790	3,324	4,211[1]
1990	156	620,092	5,039	8,175[1]
1991	209	752,978	8,957	8,732[1]
1992	254	845,283	10,319	11,718

[1] Incomplete data.

DAMAGE CONTROL ASSISTANCE PROGRAM

Initiated in 1988, the Damage Control Assistance Program (DCAP) was designed to increase a landowner's management options by allowing a more liberal harvest of antlerless deer than could be obtained under the existing system of county regulations. DCAP permit tags can only be used to harvest antlerless deer (does and male fawns) and are not valid for antlered bucks.

The primary objective of DCAP is to provide site-specific assistance in the control crop depredation by deer or other property damage. Secondary objectives are to maximize hunter participation in the control effort and to shift closed-season Kill Permit deer harvest(s) into the open deer season. Landowners issued out-of-season Kill Permits during the calendar year are not eligible for DCAP.

Participation in DCAP is limited to landowners and/or lessees with damage documented by a VDGIF Game Warden. Damage permits are issued on a per acre basis. DCAP permits can be utilized only on the designated area for which they were issued and are valid during all seasons (archery, muzzleloader, and general firearms).

The applicant is allowed to fill up to 5 permits and issue permits to hunters of their choice. However, deer hunters are limited to only one DCAP deer per season. Successful DCAP hunters must validate the special DCAP tag from their bear-deer-

turkey license with the detachable (peel off) sticker from the DCAP permit and attach the validated tag to the carcass.

In a survey of DCAP cooperators following the 1988 season, 45 percent believed that deer damage would be reduced as a result of their participation in the program. Seventy-five percent planned to participate in the program again in the future and 53 percent had allowed more deer hunters to hunt on their property as a result of the program. Overall, 76 percent rated the program as either satisfactory or excellent.

Table 3. Status of the Damage Control Assistance Program in Virginia, 1988-1992.

	No. of Cooperators	Acres in Program	No. of Permits	Deer Harvested
1988	492	244,685	14,762	
1989	485	239,156	13,891	
1990	775	384,510	22,387	
1991	629	399,621	15,549	
1992	865	458,263	21,700	6,194[1]

[1] Incomplete data (613 out of 865 cooperators reported).

KILL PERMIT SYSTEM

As provided by Virginia State Statute (Division I, General Statutory Provisions, Title 29.1, Game, Inland Fisheries and Boating, Chapter 5, Wildlife and Fish Laws, Article 2, Hunting and Trapping, **§29.1-529. Killing of deer or bear damaging fruit trees, crops, livestock or personal property or creating a hazard to aircraft**), the VDGIF is authorized to permit owners or lessees of land on whose lands deer are causing damage to kill such deer.

Under the kill permit system, a landowner/lessee sustaining deer damage must report the damage to the local game warden for investigation. If, upon investigation, the game warden determines that deer are responsible for the reported damage, he/she is required to authorize in writing that the owner/lessee, or other person(s) designated by the game warden, be allowed to kill deer when they are found upon the property where the damage occurred. The game warden may specify in writing the sex of the deer that may be harvested and a time limit during which the permit is authorized. The carcass of every deer killed under the permit may be awarded to the owner or lessee by the game warden.

As needed, the VDGIF will consider changes to the Kill Permit System that would make the system more streamlined and efficient.

Table 4. Status of the Virginia Department of Game and Inland Fisheries kill permit system, 1987-1992.

Year	No. of Permits Issued	No. of Deer Harvested
1987	470	1,670
1988	580	1,895
1989	515	1,510
1990	781	2,579
1991	887	2,752
1992	1,120	4,774

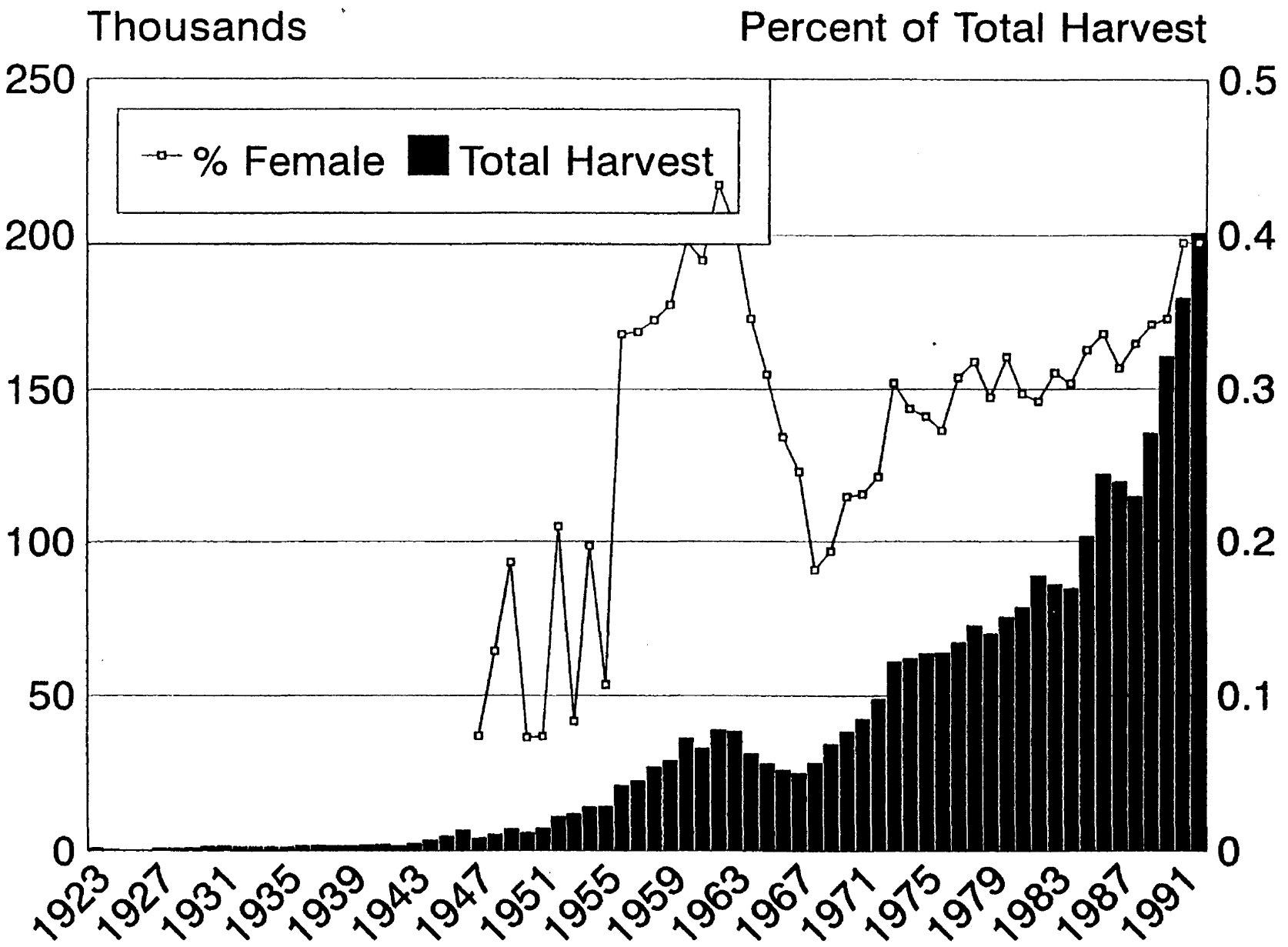

Figure 1. Virginia deer harvest, 1923-1992.

CONCLUSIONS AND RECOMMENDATIONS

The Deer Damage Committee solicited input from state agencies and commodities producers regarding the economic impact of deer damage in Virginia. Based on presentations made to the Committee and other available data, the Committee estimated that the amount of agricultural crop damage and property damage caused by deer in Virginia in 1992 was approximately $11.4 million and $4.2 million, respectively (Table 1).

The Deer Damage Committee offers the following recommendations:

Recommendation 1:

That the VDGIF continue to develop and refine a statewide White-tailed Deer Management Plan that establishes deer herd objectives by defined management unit(s).

Historically, Virginia's deer management program has been noted for both its success and simplicity. During the period 1973-1988, Virginia's deer management program was based on a goal of maintaining the percentage of female deer in the total legal harvest at approximately 30%. This was accomplished by increasing or decreasing the number of antlerless deer hunting days established at the end of the general firearms season. When the percentage of does harvested did not exceed 30 to 40%, the harvest in succeeding years either increased or remained stable (Virginia Game Investigations 1975).

Over the past four years, 1989-1992, the total statewide deer harvest and percent females in the harvest have increased dramatically in response to rapid liberalization of deer seasons, bag limits, and number of either-sex hunting days. This liberalization of seasons and regulations was designed to increase the antlerless deer harvest and stabilize and\or reduce the deer herd. In fact, as the statewide deer harvest has increased over the past four years, the statewide deer population has likely been stabilized or decreased.

Historically, antlerless harvest objectives have been established every two years by adjusting the bag limit and/or the number of either-sex day(s) regulations by county. In the future, as a revised statewide Deer Management Plan is drafted, written objectives will establish target population densities by specified management unit(s) (e.g., county and/or physiographic region). Utilization of deer population models (e.g., Deer Camp, Moen et al. 1986) and population reconstruction models (e.g., Downing 1980 and Lang and Wood 1976) should allow VDGIF biologists to monitor and regulate deer population trends more reliably in the future. Deer population goals will be based on providing as much recreational deer hunting opportunity as

possible without harming the resource and directing the population control as necessary to minimize crop depredation and deer-vehicle collisions.

Recommendation 2:

That the VDGIF consider, as needed, further liberalization of their current deer hunting regulations (e.g., season lengths, bag limits, license design, number of either-sex hunting days, bonus deer permits) and deer management programs (e.g., the Deer Management Assistance Program, Damage Control Assistance Program).

The Committee concluded that reduction of deer herds primarily through harvest of antlerless deer by recreational or sport hunters is the most effective and cost-efficient method to manage deer damage to crops, vehicles, and property (Ellingwood and Caturano 1988). The Committee also recognizes that, to the best of their knowledge, Virginia is the only state in the Southeast that has created and administers a deer damage management program (i.e., the Damage Control Assistance Program) to provide site-specific assistance. This program is provided at no cost to participants.

Over the past four years, 1989-1992, the total statewide deer harvest and percent females in the harvest have increased dramatically in response to rapid liberalization of deer seasons, bag limits, and number of either-sex hunting days. For the upcoming 1993 deer season, regulation changes have been made that will significantly increase deer hunting recreation and harvest opportunities. Although the general firearms season length has not been changed, either-sex day opportunities have been standardized across physiographic regions where possible and liberalized in most counties. An additional week also has been added to both the early archery and early muzzleloading seasons. In addition, unlimited bonus deer permits have been made legal statewide on private land only, to provide private landowners a more liberal management option. As specific goals are identified in a statewide deer management plan and population reconstruction models allow for greater precision in population monitoring, further liberalization of deer regulations may be required. Conversely, more conservative deer regulations may also be warranted in some areas.

Recommendation 3:

That the federal and state land management agencies of the Commonwealth of Virginia be strongly encouraged to implement and/or expand deer management activities on lands under their supervision. The effect of a "no hunting" deer management strategy on some of these lands should be revaluated. This analysis should address the effect(s) of current deer management

on (1) crop and property damage levels of adjacent landowners and the efficacy of their damage control efforts, (2) deer-vehicle collision rates, and (3) the impact that high deer herd densities have on native floral and faunal communities.

The substantial deleterious impact that contiguous deer "refuges" have on crop damage levels of adjacent landowners and their damage control efforts was mentioned repeatedly in presentations made to the committee and subsequent discussions of deer damage. These problem areas ranged from the increased posting of small tracts of private land statewide, to state managed lands, to federal managed lands such as National Parks.

The land management agencies of the Commonwealth of Virginia are to be highly commended for their proactive deer management programs. Deer hunting is currently allowed in designated areas of Pocahontas, Occoneechee, Fairy Stone, Sailor's Creek Battlefield and Grayson Highlands State Parks and the Appomattox-Buckingham, Cumberland, Pocahontas, and Prince Edward State Forests. Controlled deer hunts are also held at False Cape, Mason Neck, and York River State Parks. However, the current "no hunting" management option employed by some state and federal agencies has contributed to the development and maintenance of artificially high deer densities. As a result, deer herd health has suffered, habitat quality has declined, and crop damage levels on adjacent properties has been exacerbated. Contrary to current public perception, white-tailed deer do not control their own numbers. Lacking other external regulating factors, deer populations will inevitably expand to the point where food resources are limited, or in some cases exhausted (McCullough 1979). The food supply, or lack of it, "controls" deer numbers. In severely over-populated deer range, the presence of a conspicuous browse line is indicative of the potential impact on habitat caused by deer. Not only does this habitat degradation affect deer herd health it may also displace other wildlife communities (e.g., neotropical migrant songbirds) that are dependent upon understory and midstory vegetation typically removed by over browsing by deer.

Recommendation 4:

That the VDGIF, in cooperation with the Department of Agriculture and Consumer Services, Virginia Cooperative Extension Service, and Virginia Farm Bureau consider developing a private land deer hunter access program.

In the future, for private lands that currently are posted in Virginia, pilot programs such as West Virginia's Department of Natural Resources Cooperative Landowner/Sportsman Access Program may have merit. The program is designed to help landowners who have higher than desired deer densities on their property control

deer numbers and provide deer hunters access to additional private lands on which to hunt.

An ancillary problem of the opposite nature may exist in eastern Virginia where many large tracts of land are tied up by deer hunting clubs that maintain limited memberships. In these areas where access and/or hunter pressure is artificially reduced, hunting pressure may not be adequate to control deer numbers.

Recommendation 5:

That the VDGIF, in cooperation with the Cooperative Extension Service, the Department of Agriculture and Consumer Services and the United States Department of Agriculture (APHIS) should be encouraged to pursue funds to produce educational materials regarding deer management and damage options.

Presentations by and discussion with agricultural commodity producers during the deer damage study clearly indicated that there is considerable demand for technical assistance and education on various deer management options and deer damage abatement. More emphasis (i.e., resources, research, etc.) needs to be placed on protecting crops and property through deer damage abatement methods such as repellents, exclusion devices (e.g., fencing), and cultural/husbandry techniques. As public sentiment continues to turn against hunting for many reasons, it must be effectively demonstrated that recreational deer hunting is a viable, cost-efficient management tool that not only maintains a healthy deer resource, but also reduces deer crop damage levels and deer-vehicle collision rates.

There is a need to develop educational programs to teach agricultural producers, city and county governments, businesses, and homeowners how to address deer damage. Detailed booklets explaining conventional and electric fencing, efficacy of repellents, ornamental plantings less palatable to deer, varieties of crops more tolerant to deer browsing, and state deer management programs are needed. An important component of the educational program should be the development of demonstration areas and exhibits that display deer damage management methods at Agricultural Experiment Stations, selected homeowner associations, and county and state fairs. Wildlife professionals need to provide seminars for agricultural groups and homeowner associations, technical assistance by telephone and on-site visits, and when necessary, to design a comprehensive deer damage management plan for persons suffering deer damage. The USDA-APHIS-Wildlife Services program cooperates with state agencies to develop wildlife damage management programs and can provide matching funds for such programs.

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APPENDIX I

HOUSE JOINT RESOLUTION NO. 588

House Amendments in [ ] - February 5, 1993

Requesting the Department of Game and Inland Fisheries [, assisted by the Virginia Polytechnic Institute and State University, the Virginia Cooperative Extension Service, the Virginia Department of Agriculture and Consumer Services and the Animal Damage Control Agency of the United States Department of Agriculture,] to study damage caused by deer and to make recommendations to reduce such damage.

Patrons—Clement and Abbitt

Referred to the Committee on Conservation and Natural Resources

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WHEREAS, the Department of Game and Inland Fisheries has estimated that the size of Virginia's deer herd has grown by 12 percent from 800,000 to 900,000 in the past year; and

WHEREAS, it is estimated that Virginia's farmers lose 10 to 20 million dollars a year due to crop damage by deer; and

WHEREAS, since 1981, annual vehicle collisions with deer have increased by 240 percent to 3,427 and associated costs of vehicle damage increased 550 percent to $5,508,811 in 1990; and

WHEREAS, since 1981, 11 individuals have lost their lives and 1,886 have been injured in automobile collisions with deer; and

WHEREAS, deer are a growing nuisance in urban and suburban areas; now, therefore, be it

RESOLVED by the House of Delegates, the Senate concurring, That the Department of Game and Inland Fisheries, assisted by the Virginia Polytechnic Institute and State University, the Virginia Cooperative Extension Service, the Virginia Department of Agriculture and Consumer Services and the Animal Damage Control Agency of the United States Department of Agriculture, be requested to undertake a study assessing the extent of damage to crops, vehicles, property, and citizens of the Commonwealth caused by deer. The study shall make recommendations on the establishment of deer management plans by county or by physiographic region. The recommendations shall be based on (i) providing recreational deer hunting opportunities and (ii) population management to control damage caused by deer.

All agencies of the Commonwealth shall, upon request, assist in the conduct of the study.

The Department of Game and Inland Fisheries shall complete its work in time to submit its findings to the Governor and the 1994 Session of the General Assembly as provided in the procedures of the Division of Legislative Automated Systems for processing of legislative documents.

Official Use By Clerks

Agreed to By The House of Delegates		Agreed to By The Senate	
without amendment	☐	without amendment	☐
with amendment	☐	with amendment	☐
substitute	☐	substitute	☐
substitute w/amdt	☐	substitute w/amdt	☐

Date: _____ Date: _____

Clerk of the House of Delegates

Clerk of the Senate

APPENDIX II

Virginia Farm Bureau Federation

Results of Animal Damage Survey - 1991

1. How many acres do you operate on this farm or ranch?
   137,143 (Average 438)

2. Please put a check by any of the following items produced on your operation:

252 - field crops	14 - nursery crops
245 - livestock	94 - vegetables
51 - fruit	21 - other
10 - aquaculture	184 - timber

3. Do wild animals cause damage on your farm or ranch?

   268 - yes
   33 - no

4. Put a check by the animals causing damage on your farm:

20 - bear	77 - beaver	17 - coyote
232 - deer	0 - elk	46 - fox
261 - groundhog	45 - mice/vole	18 - migratory waterfowl
0 - prairie dog	46 - rabbit	122 - raccoon
27 - skunk	0 - wolves	20 - other

5. Please check the estimate that most closely approximates your annual losses due to wildlife damage:

   56 - less than $100 (19.7%)
   155 - between $100 to $1,000 (54.5%)
   73 - over $1,000 (25.7%)

6. As a land operator, are these losses due to wildlife damage acceptable?

   113 - yes (42%)
   156 - no (58%)

7. As a solution to the wildlife damage on your farm, would you prefer?

   3 - Animal damage control programs administered by Federal agencies
   102 - Animal damage control programs administered by your state
   88 - Animal damage control programs administered cooperatively by both
   82 - Compensation for your losses
   22 - other

8. Do you purposely provide habitat for wildlife on your farm or ranch?

   149 - Yes
   130 - No

9. Please check the following activities you may be doing to encourage wildlife and/or provide wildlife habitat:

102 - Leaving crop residues in the fields
41 - Leaving a portion of the crop unharvested
114 - Providing cover areas adjacent to cropland
98 - Providing a water source such as wetlands or ponds
32 - Maintaining salt licks
13 - Other

10. Do you allow hunting on your property?

246 - Yes
44 - No

11. If you allow hunting on your property, please check the number of hunters you allow and the number of hunter days you allow hunting:

87 - 0-5
62 - 6-10
97 - 11 or more

Number of hunter days you allow hunting:
(number of hunters X number of days)

39 - 0-10
59 - 11-30
70 - 30+
73 - unlimited access?

12. If you allow hunting on your property, do you charge hunters a fee?

19 - Yes
238 - No

APPENDIX III

STATEMENT OF RUSSELL C. SCHOOLS, EXECUTIVE SECRETARY
VIRGINIA PEANUT GROWERS ASSOCIATION
JUNE 10, 1993

I am Russell C. Schools, Executive Secretary of the Virginia Peanut Growers Association located in Capron, Virginia. I'm also a deer hunter and land owner in Southampton County. I've been a member of Indiantown Hunt Club for thirty (30) years and we have worked with the Virginia Department of Game and Inland Fisheries to attempt to control the deer herd in our area.

I understand first hand the damage that can be done by deer to the peanut crop here in Virginia. As a landowner with a farm near Capron, Virginia, deer damage was so severe that we have had to move the peanuts from our farm and combine our quota with some others and plant the peanuts on the second farm to prevent the damage that was occurring on the property that we own bordering a creek in Southampton County.

Peanuts are grown in primarily eight (8) counties here in Southeastern Virginia. Peanuts are the third leading cash crop in the state following tobacco and soybeans. We have almost 4,000 peanut farms in these eight counties and the value of the peanut crop each year will vary from approximately 80,000,000 to 100,000,000 dollars to these producers. In preparing for this paper today, I contacted the Extension Agents and farmers in the eight counties and had them come up with a figure as to the loss in their respective counties. The estimates ran from 1% in some counties up to as much as 4% in some counties. I'll now list the eight peanut counties, the acres planted last year, and the estimated loss.

COUNTY	ACRES PLANTED	ESTIMATED LOSS
SOUTHAMPTON	30,000	2%
ISLE OF WIGHT	16,000	1%
CITY OF SUFFOLK	14,000	4%
SUSSEX	12,200	2%
GREENSVILLE	8,200	2%
SURRY	7,500	2%
DINWIDDIE	3,000	1%
PRINCE GEORGE	2,500	4%

These figures add up to 93,400 acres planted in 1992 and using the loss figures given to me by the Extension Service and farmers in these counties it appears that we had 3,000 tons lost to deer in 1992. This 3,000 tons times the support price of $675 per ton for quota peanuts calculates out to just over $2,000,000 suffered by deer damage for the eight peanut counties.

I appreciate the opportunity to be here today and present these facts on behalf of Virginia's peanut producers and would be glad to attempt to answer any questions that you might have.

Thank you very much.

APPENDIX IV

1992 DEER DAMAGE SURVEY - PRODUCERS (December, 1992)

REGION	ACREAGE	ACREAGE DAMAGED	ACREAGE REPLANTED	ESTIMATED YIELD LOSS
				Bu/A
NORTHERN NECK	5552	1154	149	19857
MIDDLE PENINSULA	16276	3853	779	25539
SOUTHEAST	8233	1386	267	10497
EASTERN SHORE	1725	927	21	5929
WEST OF 95, NORTH OF 64	1457	253	0	3427
WEST OF 95, SOUTH OF 64	5910	1931	72	22648
STATE TOTAL	39153	9504	1288	87897

1992 Average yield loss per acre: 2.25 bu/A.
1992 Estimated dollar loss to Virginia Soybean Producers: $6.30 million dollars.

QUESTIONS

4. Is deer damage more common or full season or double crop soybeans, or about the same on both?

   Both = 48.6% FS = 18.9% DC = 32.4%

5. Is deer damage more common on early maturing (maturity groups III or IV) or later maturing soybeans (maturity group V or VI), or about the same on both?

   Early = 5.6% Late = 36.1% Both = 58.3%

7. If you have significant deer damage, do you obtain and use out of season deer kill permits? _____ Yes = 31.9% No = 68.1%

9. In your opinion, would you favor legislation to significantly reduce Virginia's deer population, now estimated at 900,000? Yes = 90.3% No = 9.7%

Survey Conducted by: Paul F. Reese, Jr.
Virginia Tech

992 AGENTS SURVEY ON DEER DAMAGE (December, 1992)

REGION	ACREAGE	ACREAGE DAMAGED	ACREAGE REPLANTED	ESTIMATED YIELD LOSS
ORTHERN NECK	43000	6600	230	68975
IDDLE PENINSULA	36500	3565	138	36813
OUTHEAST	65000	10480	1105	105400
ASTERN SHORE	98000	6090	150	136648
EST OF 95, NORTH OF 64	800	8	0	248
EST OF 95, SOUTH OF 64	24800	3010	620	66185
TATE TOTAL	268100	29753	2243	414269

)92 Average yield loss per acre: 1.55 bu/A
)92 Estimated dollar loss to Virginia Soybean Producers: $4.33 million dollars

APPENDIX V

Deer Damage Hearing
August 13, 1993 - Virginia Tech
Harlan White, Extension Agronomist, Forages

~125,000 Acres Alfalfa (2-5% Loss)

* New stands are most susceptible (especially fall)
* Grazing pressure greatest in isolated field near woods
* Difficult to assess losses because plants continue to grow - probably more than is realized
  Assume 20% of the acres are heavily grazed to remove
  1/4 Ton/A: 25,000 acres @ 1/4 T/A loss = 6,250 T @ $100/T = $625,000

1,020,000 Acres Clover - Grass Hay + 3,000,000 acres pasture

* Overall, damage is not "significant"
* Can have spots in isolated fields grazed so hard they are killed

160,000 Acres Corn For Silage

* Serious damage to only very small acreage <1%.

Rye Cover Crop - a lot grazed, but no real injury.

Soybeans for hay - serious injury.

Fence knock down

* Problems keeping temporary interior fences up because deer "run through"
* Damage to fences which allow cattle to get into crop fields

Conclusions

* Deer sightings as they feed on forage crops are increasing
* Overall, deer feeding on forages is "tolerable"
* In some specific instances, deer are causing significant grazing production losses in alfalfa fields (estimate 2-5% overall)
* "Tolerable" feeding losses vary greatly with attitude of the producer

APPENDIX VI

VIRGINIA NURSERYMEN'S ASSOCIATION, INC.

383 Coal Hollow Road, Christiansburg, VA 24073-6721 • Phone: 703-382-0943 FAX: 703-382-2716

August 13, 1993

TO: Virginia Department of Game and
Inland Fisheries Deer Committee

FROM: Virginia Nurserymen's Representative
Gregory W. Miller - Willow Springs Tree Farms, Inc.
Radford, Virginia

REF: Deer Damage in Virginia's Nursery Industry

We mailed a survey to the 173 grower members of the Virginia Nurserymen's Association to determine the extent of deer damage in Virginia. Although these members only have approximately 5300 acres of nursery stock, there are at least another 300 growers around the state with considerable acreage who were not contacted.

The amount of damage on an annual basis ranged from $150 to$35,000 per grower that responded to the survey with the average being approximately $3,000 + per year. I believe that it would be safe to say that Virginia's Nurserymen incur at least $350,000 to $500,000 + in deer damage per year.

The damage occurred all over the state with the highest percentage from the Eastern Shore to the lower 3/4ths of the state to Southwest Virginia.

The primary damage included browsing of plant growth, antler rubs, and uprooting new plantings. The majority of the damage occurred from early fall through the spring.

Where it was legal or feasible, most of the landowners allowed hunting on their property and many had utilized the Deer Management Assistance Program to control the deer with mixed results.

A majority of the growers have also tried various methods of deterrent such as expensive electric fences, bags of human hair, soaps, and several commercial products. Other than the fencing option, most of the other methods produced short term or negligible results.

The survey showed overwhelming positive response for legislation to significantly reduce the deer population in Virginia.

Respectively Submitted,

Gregory W. Miller

Gregory W. Miller

APPENDIX VII

DEER DAMAGE TO FRUIT ORCHARDS IN VIRGINIA

STATEMENT BY CLAYTON O. GRIFFIN, EXECUTIVE SECRETARY
VIRGINIA STATE HORTICULTURAL SOCIETY
AUGUST 13, 1993

My name is Clayton Griffin and I am the Executive Secretary of the Virginia State Horticultural Society. The Virginia Horticultural Society whose offices are located in Staunton, VA is a trade association representing the interests of commercial apple and peach producers in the state.

The issue of deer damage in orchards is not new but moreover has been viewed as a serious problem for a number of years. In that time, the fruit industry has conducted research, sought the opinions of experts and participated in the regulatory and legislative process to liberalize the laws effecting the management and control of deer herds in Virginia. Damage control measures for the fruit industry have primarily been through the use of permits, repellents and fencing, however most growers still maintain deer damage is a serious problem with little control.

Hardest hit are the young trees. Deer damage is the number one problem for young fruit trees. As tree fruit production trends move to high density plantings of dwarf and semi-dwarf trees, these trees are at high risk and particularly susceptible to deer damage. 3-5 year old trees are at an ideal height for browsing and deer like the young tender growth. Damage in these early years can seriously alter tree form, reduce tree growth, limit bearing capacity and may kill the trees if

deer are allowed to feed repeatedly. Deer cause the most damage by browsing in the spring (February through May) and horning in the fall (August through November).

Fencing is viewed to be one of the most dependable means of control, however the high cost per acre discourages most people. Even if a woven wire fence is used it must be eight feet high to be effective and such construction and maintenance makes it impractical particularly on large blocks of fruit. Even new techniques in fence design or high-tensile electric fences are not foolproof. Many growers say deer fence work only for a limited time before the deer learn how to get over, under and even through a fence.

Ongoing research in Virginia has found that deer damage can be reduced with repellents however that research also supports repellents do not offer a long-term solution to the problem.

The 1992 Tree Fruit Survey reported apples and peaches are produced on 25,000+ acres in 35 counties in Virginia. The survey also showed a 26% increase or 500,000 new trees have been planted in commercial apple orchards in the past five years. This increase in trees reflects the trend of removing old standard trees and replacing them with higher density plantings of size control (dwarf) rootstock. Young trees under 7 years of age comprise 34 % of the total apple and peach trees. These young trees are future of our industry.

The Virginia fruit industry pledges its support to the work of this committee and supports legislative measures that will

establish management programs to control damage caused by deer.

APPENDIX VIII

Virginia Department of Transportation (VDOT) deer vehicle collision data, 1967-1992.[1]

Year	1	2	3	4	5	6	7
1966	0	0	19	24	496	515	$113,400
1967	2	2	53	67	429	484	$257,644
1968	0	0	31	43	712	743	$178,165
1969	1	1	30	39	858	889	$230,822
1970	0	0	29	40	1,181	1,210	$337,482
1971	0	0	28	34	1,310	1,338	$371,200
1972	1	1	44	61	1,607	1,652	$488,100
1973	0	0	44	55	1,635	1,679	$515,500
1974	0	0	32	38	1,434	1,466	$468,400
1975	0	0	38	45	963	1,001	$407,500
1976	1	1	49	71	1,110	1,160	$540,100
1977	2	2	48	62	1,304	1,354	$639,700
1978	0	0	61	87	1,156	1,217	$734,000
1979	0	0	64	86	1,129	1,193	$727,800
1980	1	1	67	78	1,165	1,233	$855,300
1981	1	1	76	89	1,305	1,382	$930,600
1982	0	0	77	96	1,369	1,446	$1,231,900
1983	0	0	93	103	1,569	1,662	$1,448,226
1984	1	1	103	127	1,717	1,821	$1,780,882
1985	0	0	136	167	1,972	2,108	$2,177,483
1986	2	2	169	206	2,430	2,601	$2,617,714
1987	0	0	186	214	2,767	2,948	$3,710,261
1988	0	0	170	206	2,637	2,807	$4,133,366
1989	1	2	177	205	2,563	2,740	$4,327,148
1990	3	3	204	242	3,220	3,427	$5,508,811
1991	2	2	199	231	1,741	1,942	$3,275,386
1992	1	1	220	272	268	489	$1,037,540[2]

[1] VDOT maintained roads only.
[2] Preliminary data for 1992.

Legend
1 - Fatal Accidents
2 - Persons Killed
3 - Injury Accidents
4 - Persons Injured
5 - Property Damage Accidents
6 - Total Accidents
7 - Amount of Property Damage

APPENDIX IX

VDGIF county damage stamp program financial report summary, 1992[1].

	1	2	3	4	5	6	7
Alleghany	3,369	7,076	3,657	480	0	0	6,307
Craig	895	9,087	457	4,566	0	4,500	458
Floyd	1,722	3,368	0	200	0	0	4,889
Highland	3,010	11,392	2,118	3,855	4,985	0	3,444
Rockbridge	33	7,781	475	725	5,035	0	1,579
Russell	0	2,489	0	0	0	0	2,489
Scott	1,543	3,318	442	1,107	0	0	3,312
Wythe	483	8,682	924	3,262	1,140	2,000	1,839
Totals	11,055	53,193	8,073	14,195	11,160	6,500	24,317

[1] All amounts are in dollars.

Legend

1 Beginning Balance
2 Net Revenue
3 General Administration
4 Damage Claims
5 Law Enforcement
6 Volunteer Fire-Rescue
7 Ending Balance