

**REPORT OF THE
JOINT SUBCOMMITTEE ON
JOHNSONGRASS INFESTATION AND
JAPANESE BEETLES IN VIRGINIA**

TO

THE HOUSE COMMITTEE ON AGRICULTURE

AND

**THE SENATE COMMITTEE ON AGRICULTURE,
CONSERVATION AND NATURAL RESOURCES**



HOUSE DOCUMENT NO. 17

**COMMONWEALTH OF VIRGINIA
DEPARTMENT OF PURCHASES AND SUPPLY**

RICHMOND

1978

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REPORT OF THE
JOINT SUBCOMMITTEE ON
JOHNSONGRASS INFESTATION AND
JAPANESE BEETLES IN VIRGINIA

TO: The House Committee on Agriculture

and

The Senate Committee on Agriculture,

Conservation and Natural Resources

I. INTRODUCTION

The Joint Subcommittee studying Johnson Grass Infestation and Japanese Beetles in Virginia was established pursuant to House Joint Resolution No. 257 by the 1977 session of the Virginia General Assembly.

HOUSE JOINT RESOLUTION NO. 257

Directing a joint subcommittee of the Committee on Agriculture of the House of Delegates and the Committee on Agriculture, Conservation and Natural Resources of the Senate to study the problems of Johnson grass infestation and Japanese beetles in Virginia.

WHEREAS, Johnson grass (*Sorghum halepense*) is widespread throughout the Commonwealth; and

WHEREAS, Johnson grass has been declared a noxious weed; and

WHEREAS, despite the activities of research workers and landowners, it is spreading to new locations more rapidly than efforts to control it can be effective; and

WHEREAS, control of Johnson grass will never be brought about solely by the efforts of individual landowners combatting the weed on their own properties; and

WHEREAS, if Johnson grass is allowed to flourish on roadbanks, on drainage ditch banks, on utility rights-of-way, and on idle or vacant land, efforts of individual landowners will be wasted; and

WHEREAS, the Commonwealth has a very effective seed law which

prohibits the movement of Johnson grass and other noxious weed seed when moved in agricultural seeds; and

WHEREAS, there seems to be no restriction whatsoever on the movement of Johnson grass by soil used for grading or filling, or in sod or mulching materials, or in the spread of the weed on farm or other implements from one property to another; and

WHEREAS, the Japanese beetle has also been a serious pest to farmers and landowners in Virginia; and

WHEREAS, there is evident need for legislation regarding the control of these serious pests; and

WHEREAS, competent authorities state that ample knowledge as to chemical and cultural practices which can readily be used to control Johnson grass and Japanese beetles are available; now, therefore, be it

RESOLVED by the House of Delegates, the Senate concurring, That a joint subcommittee of the Committee on Agriculture of the House of Delegates and the Committee on Agriculture, Conservation and Natural Resources of the Senate is directed to make a study and report recommendations on a Statewide control program for Johnson grass and Japanese beetles for the Commonwealth. The joint subcommittee shall be composed of eight legislative members, four of whom shall be members of the House Agriculture Committee appointed by the Chairman thereof and four of whom shall be members of the Senate Agriculture, Conservation and Natural Resources Committee appointed by the chairman thereof. Four citizens of Virginia who are familiar with the problems relating to Johnson grass and Japanese beetles shall also be appointed to the joint subcommittee. Each respective chairman of the agriculture committees shall appoint two citizens at large, one to be knowledgeable of problems relating to Johnson grass and one to be knowledgeable of problems relating to Japanese beetles. The joint subcommittee shall consider appropriate measures that may be taken to control Johnson grass and Japanese beetles throughout the Commonwealth. It shall take into account considerations of the public interest and the rights of landowners and the means most appropriate to protect those rights. It shall consider the feasibility and desirability of legislation or other policies leading to the control of these serious pests. All officers and agencies of the Commonwealth and of its political subdivisions are directed to assist the joint subcommittee in its study upon request.

The joint subcommittee shall report its findings to each respective House and Senate Agriculture Committee by December one, nineteen hundred seventy-seven.

David G. Brickley of Woodbridge, a member of the House of Delegates and patron of House Joint Resolution No. 257 was elected Chairman. Howard P. Anderson of Halifax, a member of the Senate, was elected Vice-Chairman.

In addition to the Chairman and Vice-Chairman, James T. Edmunds of Kenbridge, William E. Fears of Accomac, and William A. Truban of Woodstock, members of the Senate, were appointed to the Subcommittee. Also appointed to serve from the House of Delegates were Joseph A. Johnson of Abingdon, George N. McMath of Accomac and Lacy E. Putney of Bedford.

The following citizens were appointed pursuant to House Joint Resolution No. 257 to serve on the Subcommittee: James Bennett of Red House; James Brownell of Bluemont; Robert B. Delano of Richmond; and Richard S. Ellis, IV, of Buckingham.

Bragdon R. Bowling, Jr. and Sieglinde F. Nix of the Division of Legislative Services served as staff to the Subcommittee. The Subcommittee expresses its appreciation to the staff of the Virginia Department of Agriculture and Commerce and to concerned citizens throughout this State for their cooperation in this endeavor.

II. SCOPE OF THE PROBLEM

A. Johnsongrass

The species of grass Sorghum halepense, commonly known as "Johnsongrass," was introduced to the United States around 1800 for use as a potential forage crop. By the latter part of the nineteenth century, it was found throughout much of the United States. It is today considered one of the ten worst weeds in the world, competing with a variety of crops for nutrients, water, sunlight and air. It causes considerable yield reductions in all row crops and lowers the value of the land. It also acts as an overwintering host for the virus which causes maize dwarf mosaic in corn. It spreads to distant areas by seed and in local areas by seed and rhizomes. Seeds are carried by birds, livestock, wind, water and machinery to infest clean fields. Johnsongrass produces hard seed which may germinate over a period of several years. Within a few years after Johnsongrass becomes established, the soil is usually heavily infested with rhizomes and seed. For example, in Louisiana, Johnsongrass produced seven tons of rhizomes per acre in the row area of a sugarcane field. One Johnsongrass plant can produce a pound or more of seed per year. The seeds may remain dormant in the soil and germinate over a period of years (three to six). Thus, new seedlings may continue to develop and create problems even after established plants are effectively controlled.

If plants are permitted to reach the six or seven leaf stage (eight to twelve inches), they produce white, spur-like growth underground. These underground stems grow slowly during the summer with greatest production occurring at the time of flowering and setting of seeds. At each joint, these rhizomes up to one-half inch thick, are capable of producing a shoot on one side and roots on the other. Most of these live over and in turn, produce a new plant the following year. A single plant can produce up to one hundred feet of rhizomes in one year. In good, deep soil, some of

these underground stems will grow to thirty inches or more in depth. These rhizomes are food storage organisms for the production of plants the following year. Most of these rhizomes live through the growing season and through the following season and then they die. Chopping these rhizomes into small pieces stimulates the growth of new shoots. Patches of Johnsongrass enlarge as these rhizomes grow out from the main plant, or are broken and scattered during tillage operations. For an effective control procedure, both seed and rhizome production must be stopped. Nothing is gained by destroying the established plant and then allowing reinfestation by seeds and rhizomes. It is the rhizome that puts Johnsongrass in the perennial classification, making it difficult to eradicate.

Johnsongrass is found in every county of Virginia and is continuing to spread rapidly. The amount of severely infested cropland with Johnsongrass has more than doubled since 1970, to over 180,000 acres in 1975. It is a persistent, costly, and difficult weed to control. There is no one single method that can be used to eliminate this pest.

B. The Japanese Beetle

The Japanese beetle, (*Popillia japonica*) in its native land, is not of economic importance. Upon reaching the United States, where there were no natural enemies, it began at once to flourish and destroy many cultivated crops, as well as ornamental trees and shrubs. The Japanese beetle is a highly destructive plant pest. The grub feeds on the roots of grasses and destroys turf. The adult feeds on flowers, shrubs, trees and fruit; and on field crops, such as corn and soybeans. This insect is believed to have been introduced into the United States near Riverton, New Jersey, sometime prior to 1916. It probably came in with soil on the roots of Iris and Peonies from Japan. It reached Virginia in 1928 and was first found in the Potomac Railroad yards south of Washington, D. C.

The adult beetle measures about one half inch in length, is bright metallic green in color, with five white spots of hairs on each side and two on the last segment of the body. The wing covers are reddish brown or bronze, and during warm summer days it is an active flyer. When once established the adult beetles fly in large groups, feed together by the thousands on favored host plants and are readily recognized. The beetles fly only during the daytime and are most active during warm sunny days. Adult beetles feed on nearly three hundred different kinds of plants. The beetles often congregate and feed on flowers, foliage, and fruit that are exposed to bright sunlight.

The immature stages develop in the ground as white grubworms. From fifty to sixty eggs are deposited by the adult female in the ground, during the summer months, to a depth of from two to four inches. The larvae feed on the small roots of grasses, weeds and cultivated plants and are usually more abundant in turf than in other places. They pass the winter in the soil, becoming active in the spring, usually the first of May in the latitude of eastern Virginia. The adults in the Richmond area begin to appear in small numbers during the last week in May with the period of

heaviest feeding from June twentieth to August first. When feeding on leaves the beetles usually chew out the tissue between the veins and skeletonize the leaves. Sometimes they make many large, irregular holes in the leaves. If a tree or shrub is heavily infested, it can lose most of its leaves in a short time. The beetles often mass on ripening fruit and feed until nothing edible is left. They seldom feed on unripe fruit. They seriously damage corn by eating the silk as fast as it develops. This prevents the kernels from forming.

From its establishment in Alexandria, the Japanese beetle continued to spread across Virginia. During this time the Virginia Department of Agriculture and Commerce maintained a state Japanese beetle quarantine to slow the spread of this pest. Virginia's quarantine paralleled the Federal Japanese beetle quarantine, which is still in effect. By 1960, only six counties in far southwest Virginia remained uninfested, and in 1964, the Virginia Japanese beetle quarantine was revoked because the entire State was infested .

During this 36-year period when the Japanese beetle spread across Virginia, the Department of Agriculture and Commerce was very active in its attempts to control this serious pest. The State quarantine allowed for the regulation of hazardous articles, such as soil and nursery stock, that might artificially spread the Japanese beetle. Also, infestations removed from the generally infested areas were chemically treated into the 1940's to eradicate these isolated spots. Hazardous areas within the generally infested areas were also sprayed to keep adult populations at a minimum, thus reducing the possibility of an adult beetle hitchhiking to a noninfested area.

During the 1930's and thru the mid 1940's, arsenate of lead was used for adult and grub control. After World War II, DDT and chlordane were the main chemicals used until termination of the quarantine in 1964. Since then, all control activities have been in the establishment of biological control agents such as milky disease spore dust.

Spore dust has been applied in Virginia since 1941, and a card record of all plots is on file with the Virginia Department of Agriculture and Commerce. Spore dust provides an effective control method by using bacterial disease to kill larvae and grubs. Two disease organisms, Bacillus popilliae Dutky and B. lentimorbus Dutky , infect the Japanese beetle grubs, causing their normally clear blood to appear milky just before death. The disease organisms infect only the Japanese beetle grubs and a few related insects, and do not harm earthworms, birds, domestic or wild animals, or humans. Once the organisms are established, birds and other animals which eat infected grubs help to carry the disease to new areas thus assisting in control. Spore laden soil that is moved on the feet of livestock and other ways also helps disseminate the disease. The spores remain alive in the soil for long periods, ready to infect and kill a high percentage of successive generations of Japanese beetle grubs as they move about in the soil and feed on the roots of plants. The spores are highly resistant to extreme temperatures and moisture and are native to the United States. In the early years spore dust was produced by the U.S.

Department of Agriculture and furnished to the States, upon request. It has been made by private industry since about 1950 and sells for approximately \$4.50 per pound to the State. It has now been applied to some extent in all counties and is considered a successful biological program where established and when coupled with a spring parasitic wasp, Typhia vernalis. This parasite has been collected and released in many areas of the state since 1940.

In addition to these efforts, numerous individuals and garden clubs have purchased and applied spore dust. The U.S. Department of Agriculture has treated international airports with spore dust and residual chemicals during the 1970's to suppress adult beetle populations that may fly into planes or hitchhike on passengers or cargo.

The Department of Agriculture and Commerce assists growers who ship regulated articles in interstate commerce by providing for the certification of commodities such as nursery stock and fresh vegetables. The U.S. Department of Agriculture has announced its intention to revoke the federal quarantine in the near future.

III. ACTIVITIES OF THE SUBCOMMITTEE

The Subcommittee conducted its organizational meeting on May, 17, 1977. At that meeting, the Department of Agriculture and Commerce discussed the problems inherent in combatting the spread of Johnsongrass and Japanese beetles in this State. Several recognized experts from Virginia Polytechnic Institute were also heard. The Subcommittee discussed such things as increased educational programs and incentives. Programs in other states were analyzed as was the Federal Noxious Weed Act. The Department of Agriculture and Commerce was directed to furnish to the Subcommittee a list of alternative approaches for controlling Johnsongrass and Japanese beetles.

In September, the Subcommittee met again. The Department of Agriculture and Commerce presented the list of alternative approaches previously requested by the Subcommittee. It was decided that a three year pilot program for controlling Johnsongrass should be instituted. It was also decided that an increased educational effort should be recommended for both Japanese beetles and Johnsongrass control.

Also, it was felt that the present Department of Agriculture and Commerce control program for Japanese beetles should be expanded to provide distribution of more spore dust to counties in this State. (See IV.)

The Subcommittee held a public hearing in October to discuss the alternatives agreed upon by the Subcommittee. Many speakers were heard, ranging from county administrators to individual farmers and citizens. It was suggested by a speaker that the Subcommittee recommend that a State law be passed requiring property owners to control Johnsongrass on their property. It was suggested that the State share the costs of fighting Johnsongrass and Japanese beetles with individual property owners. Several

speakers urged increased educational efforts on the part of the State. It was also suggested that the State should do more to urge the Federal government to supply funding for the control of these pests. It was generally agreed by all speakers that unless there was total cooperation among all landowners in a given area, any efforts at controlling Johnsongrass or Japanese beetles would fail. Representatives from the Highway Department and VEPCO supported the Subcommittee's suggested approaches.

IV. RECOMMENDATIONS

A. Johnsongrass.

The Subcommittee analyzed four alternative suggestions presented by the Department of Agriculture and Commerce:

1. Continue the present approach by leaving control efforts entirely to landowners.
2. Emphasize a large scale extension program.
3. Establish a three year pilot program with up to three counties participating to determine the effectiveness and potential of a large scale control program.
4. Establish a State-wide control program.

It was agreed that there was insufficient information available to support a State-wide approach for the control of Johnsongrass. It was felt that the third alternative would be the most beneficial recommendation the Subcommittee could make at this time. A pilot program could indicate the possibility for the success of a State-wide program in the future. Also, the Subcommittee recommends increased educational efforts by the State to provide information to landowners in combatting Johnsongrass.

The pilot program, which could include one to three counties, would be available to any interested county board of supervisors as a means of determining how effective a control and eradication program may be and to more accurately determine potential costs.

The county would adopt a Johnsongrass ordinance and be responsible for the local administration of the control program. (See Appendix 1 for sample ordinance.) The ordinance would require control of Johnsongrass. However, the landowner could enter into a written agreement specifying terms and conditions of a program for the eradication and control of Johnsongrass, and as long as the conditions in the agreement were followed, there would be no violation of the ordinance. The Virginia Department of Agriculture and Commerce and the county would enter into an agreement whereby the Department would reimburse the county for fifty percent of the costs of the program up to five thousand dollars

(\$5,000) per year.

This approach recognizes that the success of the pilot program rests with the local people, although the State would work very closely with the counties and support their efforts.

Since this approach involves fifty percent funding from the State, the administration of the State's responsibilities for the program would require one Virginia Department of Agriculture and Commerce employee to devote one half of his time to the project. Also, in a coordinated effort, one extension technician would be needed to assist in the extension effort. This person would be supervised by the existing Extension Weed Specialist.

Estimated State costs for the suggested pilot program are as follows:

Costs:	1st Year	Total 3 Years
VDAC share of 50/50 matching fund \$5,000/county for 3 counties in pilo project = \$15,000/yr. or for 3 year project, \$45,000.	\$15,000	\$45,000
1/2 man year for Supervisor @ \$12,528/yr.	6,264	19,692
Travel	1,500	4,500
Support, office operating expenses and supplies	3,000	9,000
VDAC Total	\$25,764	\$78,192
VPI & SU Extension Technician	12,000	37,656
Travel	3,000	9,000
Office operating expenses	3,200	9,600
Supplies	2,000	6,000
Publication: Color on life cycle, identification and control of Johnsongrass	9,000	
VPI & SU Total	\$29,200	\$62,256
Total	\$54,964	\$140,448

The costs are listed both for the first year and for the total 3 year period of the pilot program. Following evaluation of the program at the end of the 3rd year, it could then be determined if it is an effective means of control and then be adopted, modified, or discontinued if found ineffective.

The pilot program has several features which should help determine if a broad program is likely to be successful. The pilot program would include only one to three counties in which the local people have made a commitment to Johnsongrass control. Counties would not be forced to enter into the pilot program. Legal authority for the program would rest with the county by the adoption of a Johnsongrass Control Ordinance. The local administration of the program would be handled entirely by the county. The Department of Agriculture and Commerce's role would be to provide program assistance by way of advice and counsel as well as to reimburse the county for fifty percent of the costs of the program up to five thousand

dollars (\$5,000) per year.

Finally, the ultimate success or failure of the program rests with the local jurisdiction and landowner.

B. The Japanese Beetle

Today, the Japanese beetle is established throughout Virginia.

As far as being a problem in the production of food, feed and fiber, Japanese beetles in Virginia are now considered one pest among many that the farmer must control. For the commercial enterprise, current recommendations if followed, will effectively and economically control Japanese beetles.

The Japanese beetle is primarily a homeowner problem, i.e., a problem in home gardens, lawns, ornamental plants and fruit trees. Any state assistance, therefore, would be directed in part, to this segment of the Commonwealth. The Department of Agriculture and Commerce suggested three major alternatives in controlling Japanese beetles.

ALTERNATIVES

1. Continue the present approach by applying approximately five hundred pounds of spore dust annually.
2. Encourage an all-out program to apply milky disease spore dust.
3. Establish a cooperative program with counties.

It is recommended that the State increase its educational programs rendered by the Extension Service to instruct landowners in methods of control to reduce damage caused by the Japanese beetle.

Also, the Department of Agriculture and Commerce presently distributes throughout the State approximately five hundred pounds of milky disease spore dust each year depending upon funds for the purchase of materials. Two to three times this much has been used in years prior to 1976. Because of the Virginia Department of Agriculture and Commerce's limited supply of spore dust, demand from local communities exceeds the Department's ability to honor requests for the spore dust. Since the State program began in the late 1930's, all counties have received milky disease spore dust in at least a limited amount. The approximate yearly cost for the material is \$3.50 to \$4.00 per pound plus cost of application. The Department of Agriculture and Commerce spent \$16,500 in fiscal year 1975-1976 in surveys, application, insecticide and regulatory phases of the Japanese beetle program.

In some areas, counties or local community associations have encouraged the application of spore dust. The costs for these programs

vary depending on the local participation involved.

The Subcommittee recommends that the present control program of the Virginia Department of Agriculture and Commerce should be expanded to provide distribution of one thousand pounds or more of spore dust each year.

Respectfully submitted,

David G. Brickley, Chairman

Howard P. Anderson, Vice-Chairman

James Bennett

James Brownell

Robert B. Delano

James T. Edmunds

Richard S. Ellis, IV

William E. Fears

Joseph A. Johnson

George N. McMath

Lacy E. Putney

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APPENDIX I

County Ordinance

Johnsongrass Control

The existence of growth of a species of grass, Sorghum halepense, commonly known as "Johnsongrass", as well as other Sorghuym spp. with perennial rhizomes (includes perennial sweet sudangrass, sorghum alnum and hybrids derived therefrom are hereby declared to be a public and common nuisance.

It shall be unlawful to knowingly allow Johnsongrass to set seed on any land and it shall be the duty of each landowner to mow, to cultivate, or to treat with chemicals, or use such other practices as may be prescribed by the County Board of Supervisors as effective in preventing seed set on all Johnsongrass infestations on his property. Provided, however, a landowner or lessee may enter into a written agreement with the County Board of Supervisors or their designee, specifying terms and conditions of a program for the eradication and control of Johnsongrass, and so long as all the terms and conditions are being complied with, there is no violation of this ordinance as to the land covered by the agreement.

It shall be unlawful to import Johnsongrass into this county or to transport Johnsongrass within this county in any form capable of growth. It shall be unlawful to knowingly contaminate any uninfested land with Johnsongrass through the movement of rootstocks, plant parts, seed, soil, mulch, nursery stock, farm machinery, or other medium.

The Board may enter into an agreement with the Virginia Department of Agriculture and Commerce for the purpose of control and eradication of Johnsongrass within the county and may accept funds from the Department as agreed upon.

There is hereby established a Johnsongrass Control Committee composed of _____ members, each to serve at the pleasure of the board, who shall appoint all individuals responsible for a Johnsongrass control program, approve all expenditures of funds, and administer Johnsongrass control programs for the county, subject to the supervision of the Board of Supervisors.

The Johnsongrass Control Committee, or their representatives, may conduct surveys to determine the location and amount of infestations of Johnsongrass within the county, and may provide technical and other assistance to landowners in a cooperative control or eradication program, and may effect a program of mowing, spraying or other control or eradication practices on road rights-of-way, drainage ditch banks, parks, playgrounds, utility right-of-way and other public or private lands.

The Board may accept, use, or expend such aid, gift, grant, or loan as

may from time to time be made available from any source, public or private, for the purposes of carrying out the provisions of this ordinance.

Services rendered may be billed to the landowner or lessee and collected. All reimbursements shall be promptly deposited in a special Johnsongrass control fund regardless of date accrued or collected and shall not revert to the General Fund of the County.

Any person who fails or refuses to comply with the ordinance shall, upon conviction, be guilty of a misdemeanor and shall be fined not more than five hundred dollars.

