

**REPORT OF  
THE VIRGINIA DEPARTMENT OF AGRICULTURE  
AND CONSUMER SERVICES**

# **Study of the Plight of Virginia's Beekeepers**

**TO THE GOVERNOR AND  
THE GENERAL ASSEMBLY OF VIRGINIA**



## **SENATE DOCUMENT NO. 20**

**COMMONWEALTH OF VIRGINIA  
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## **PREFACE**

This study was undertaken in response to Senate Joint Resolution 38 of the 2006 Session of the Virginia General Assembly, which requested that the Department of Agriculture and Consumer Services study the plight of Virginia's beekeepers and the regulation of honey production by small beekeeping operations. The Commissioner of Agriculture and Consumer Services formed a Work Group to identify problems and recommend remedies to assist beekeepers. The work group was assisted by staff of the Department of Agriculture and Consumer Services. We wish to recognize the members of the work group who contributed their time and expertise to this effort:

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## **EXECUTIVE SUMMARY**

Senate Joint Resolution Number 38 of the 2006 General Assembly requested the Virginia Department of Agriculture and Consumer Services (VDACS) to study the plight of Virginia's beekeepers and outline possible remedies to the problems identified by the study. The resolution also requested the Department to examine the regulation of honey production by small beekeeping operations.

The Commissioner of Agriculture and Consumer Services formed a Work Group to conduct the study. The work group consisted of beekeepers, farmers, and nursery and retail representatives, as well as specialists from the University of Mary Washington, Virginia Polytechnic Institute and State University, Virginia State University, and Virginia Cooperative Extension. The work group administered a comprehensive survey to beekeepers and another to farmers in the Commonwealth, and conducted a listening session. During the listening session, experts made presentations on the issues identified by the surveys. A public comment period followed the listening session to provide individuals and groups an opportunity to share their concerns regarding beekeeping, pollination, and honey production. (The work group was assisted by staff in VDACS.)

### **Key Findings**

After reviewing the surveys and listening session presentations the Beekeeper Study Work Group found that:

1. There is complete agreement that honey bees are crucial to the success of agriculture and the health of the environment. Pollination by honey bees increases crop production and quality, thus enhancing producer revenue.
2. The number of honey bee hives maintained by beekeepers in Virginia has decreased by more than 50% since the mid-1980's. The feral, or wild, honey bee nests nearly disappeared in 1996 and have only recently begun to reappear in some limited areas.
3. Interest in beekeeping has generally increased. Beekeepers are not seeking to increase the number of hives owned. However, they recommend beekeeping to others as a hobby or commercial endeavor.
4. The chief concern of Virginia's beekeepers is the occurrence of Varroa mites in bee hives. This parasitic mite transmits diseases, reduces honey bee productivity, and is the major contributing factor to the annual 31% mortality rate of honey bee hives in Virginia, up from less than 8% before the introduction of honey bee mites into the state.
5. Besides parasitic mites, other invertebrate pests are adversely affecting the health and productivity of the honey bee. These pests include the greater and lesser wax moths, as well as small hive beetle (SHB). These pests damage honey bee comb, equipment, and hive products.

6. Queens are replaced every 2 to 3 years to improve production and longevity in honey bee hives. Purchased queens are usually obtained from suppliers in another state. Most of the queen producers supplying queens to Virginia's beekeepers are located in states affected by severe pests of the honey bee, such as the Africanized honey bee (AHB) and SHB.
7. Chemical products, such as miticides and antibiotics, are frequently used to control pests and diseases of the honey bee. These products present a risk of contaminating honey and wax, and have potential adverse side effects on honey bees.
8. Natural or organic alternatives are frequently requested needs for control of honey bee pests and diseases. A source of honey bee queens resistant to mites and diseases in Virginia is needed to reduce reliance on chemical products.
9. The application of lawn care products and pesticides to control public health pests, particularly insecticides, is of higher concern than the application of agriculture pesticides in the accidental poisoning of honey bee hives. Beekeepers involved in pollinating agriculture crops take precautions and instruct farmers to avoid pesticide poisoning of hives. Beekeepers with apiaries in suburban and urban locations are more susceptible to the adverse effects of pesticides used to control insect pests.
10. Loss of hive equipment and honey bees from black bear damage is a concern for rural beekeepers. These beekeepers maintain a larger number of hives and are more likely to be involved in commercial beekeeping activities than suburban/urban beekeepers. As the population of black bears increases and its range expands, human and black bear interaction is expected to increase. The Department of Game and Inland Fisheries recommends education and use of exclusionary devices to reduce the damage to bee hives caused by black bears.
11. Costs in managing honey bees is increasing due to the ongoing need to replace dead hives and unproductive queens, as well as increases in equipment, transportation, and other required business expenses.
12. Housing development, road construction, power line installation, and other forms of construction are resulting in loss of food sources for honey bees. These activities also eliminate potential locations for the placement of honey bee hives.
13. The occurrence of AHB in Florida and other Gulf Coast states increases the potential for its accidental introduction into Virginia. This pest affects not only honey bees, but also domesticated animals and the general public. Beekeepers will be an essential resource to local and state emergency management agencies responding to AHB stinging incidents and minimizing injury to people and animals. Negative public reaction and increased difficulties in managing AHB are expected to further reduce the number of beekeepers and bee hives in Virginia and jeopardize their continued availability.

14. Beekeepers and farmers generally do not purchase personal injury insurance for accidental stinging by honey bees or product liability insurance for hive products sold to the general public, such as honey, wax, and pollen.
15. Additional training and information on honey bee management is desired by beekeepers. A Master Beekeeper program, modeled after the Master Gardener program that is offered through the Cooperative Extension Offices, is highly desired. Beekeepers would also like to see additional information and support from Cooperative Extension agents and more apiary inspectors as a resource for information and assistance with honey bee management problems.
16. Farmers want information and training in the use of honey bees to improve pollination of their crops. Most of the information they receive is provided through the Cooperative Extension program. Beekeepers expressed a need to improve Cooperative Extension agent training in honey bee management and pollination activities.
17. Most of the beekeepers responding to the survey do not rent or loan hives for pollinating agricultural crops. Nearly half of the farmers responding to the survey do not obtain honey bees or other insects to pollinate their crops. The average cost of renting a honey bee hive for pollination purposes is \$45 per cycle for any given crop. However, most pollination services are provided at no cost to the farmer.
18. VDACS provides on-line access to a list of beekeepers available for pollination services for agricultural crops. However, farmers would prefer to have a hardcopy list of available beekeepers.
19. The manner in which VDACS enforces state regulations for the production of honey by small beekeeping operations does not impede the sale of honey products. Instead, many small beekeeping operations appear to have been discouraged in their efforts to market their products by specific requirements imposed by retailers, farmers' markets, and other sale venues for proof of sanitary operation of honey packaging facilities. In other cases, proof of inspection could be mandated by local ordinances or required by insurance companies to issue or renew insurance policies.

## **Recommendations**

The Work Group recommends that the General Assembly appropriate \$255,000 to VDACS in order to carry out the following initiatives:

1. Develop an integrated pest management program that is tailored specifically for Virginia to address pest and disease problems affecting honey bees, particularly with regard to the occurrence of Varroa mites in bee hives. (\$100,000)
2. Support a multi-regional queen rearing program in Virginia for the production and distribution of a pest and disease resistant line of honey bees that is productive, sustainable, and free from the aggressive behavior by bees contaminated by AHB. (\$90,000)

3. Implement programs to (i) assess the risk, monitor the occurrence, and reduce the adverse impact of AHB; and (ii) educate the public as to the importance of honey bees to agriculture, environment, and the economy. (\$24,000)
4. Promote the use of honey bees by farmers to increase crop production and quality, and encourage pollination services of beekeepers so as to eliminate Virginia's reliance on the import of honey bee hives from other states. (\$41,000)

## **BACKGROUND AND AUTHORITY**

Since the mid 1980's, the numbers of bee hives and beekeepers found in the Commonwealth of Virginia have decreased by as much as one half. The decline is largely the result of exotic honey bee pests and diseases introduced to Virginia in the last 20 years. In 2004, beekeepers approached Senator W. Roscoe Reynolds and Delegate Ward Armstrong seeking legislation to provide compensation for damage to bee hives caused by black bears, reduce the impact of pest infestations, and assist small beekeeping operations in the packaging of honey products. Senate Bill 199 and the companion House Bill 1069 provided for payment to beekeepers for damage to colonies of bees and bee equipment from funds in the Damage Stamp Program administered by the Department of Game and Inland Fisheries. Senate Bill 200 amended the powers of the Commissioner of Agriculture and Consumer Services to assist beekeepers in development of a program to maintain healthy, productive colonies of honey bees. However, no funding was provided for the implementation of these bills.

During the 2006 General Assembly, Senator Harry Blevins introduced Senate Bill 101, which sought to exempt beekeepers with 50 or fewer hives from requirement to process honey in a certified honey house or need to obtain a permit from the Virginia Department of Agriculture and Consumer Services (VDACS). This bill was continued to the 2007 General Assembly session. In the interim, Senate Joint Resolution 38 requested VDACS to conduct a study on the plight of beekeepers in the Commonwealth of Virginia. The study is to include an examination of the regulation of honey production by small beekeeping operations. The study resolution requires that the Department submit an executive summary and report of its findings and recommendations to the Governor and General Assembly by November 30, 2006.

## **STUDY SCOPE AND METHODOLOGY**

The Commissioner of Agriculture and Consumer Services formed a Work Group to conduct a study of the plight of beekeepers and provide recommendations for remedies to problems identified in the study. The work group consisted of beekeepers, farmers, and nursery and retail representatives, as well as specialists from the University of Mary Washington, Virginia Polytechnic Institute and State University, Virginia State University, and Virginia Cooperative Extension. The work group was assisted by staff from VDACS in conducting the study and preparation of a report and recommendations to the Governor and General Assembly.

The work group held two meetings. The first meeting was held June 2, 2006, to define the scope of the study. At the meeting the workgroup decided to conduct a comprehensive survey of beekeepers and farmers in the Commonwealth of Virginia and hold a listening session. Farmers growing crops that most benefit from honey bee pollination were targeted to receive a survey. The farmer survey requested information on the use of honey bees as pollinators, crop production and revenue benefits of honey bee pollination, and difficulties encountered in obtaining honey bees for pollination. A separate beekeeper survey included questions on beekeeping management, pest and disease problems, pollination activities, and other beekeeper concerns identified by the work group. The surveys were distributed by direct mail, electronic



mail, posting on the VDACS website, distribution at meetings and to beekeeper and farmer groups and associations, as well as through Virginia Cooperative Extension offices.

The second meeting was held on August 11, 2006, in the auditorium of the Virginia Farm Bureau Federation in Goochland County. The first segment of the meeting consisted of a listening session, during which experts on the issues identified by the surveys made presentations. A public comment period followed the listening session to provide individuals and groups an opportunity to share their concerns regarding beekeeping, pollination, and honey production. Comments were received from the president of the Virginia State Beekeepers Association and a beekeeper from Halifax, VA. The meeting concluded with work group discussion of the survey results and information presented during the listening session and development of a list of recommendations for improving beekeeping in Virginia.

## **OVERVIEW OF BEEKEEPING IN VIRGINIA**

Honey bees were introduced to North America in Virginia shortly after the establishment of the English settlement at Jamestown. Over the next 400 years the practice of beekeeping spread throughout North and South America becoming an integral part of agriculture. Honey bee hives are ideal for use in production of honey and pollination of fruit and vegetable crops. They are easily transported to the sites of nectar sources and crops requiring insect pollination. Honey bees gather nectar and pollen from flowering plants as a food source. Each hive contains tens of thousands of honey bees. The pollination of plants by foraging honey bees results in fertilization of seeds increasing production and value of fruits, vegetables, and forage crops. The health and diversity of forest and wetland habitats are also enhanced by honey bee pollination.

The United States Department of Agriculture National Agriculture Statistics Service estimates that there are over 2.5 million commercial honey producing hives in the United States, 9,000 of which are in Virginia. Beekeeping is also a popular hobby. The estimated 2,000 or so hobbyist beekeepers in Virginia maintain approximately 15,000 bee hives for personal production of honey. A variety of honeys is produced in Virginia, including honey from the tulip poplar and black locust trees, thistle and goldenrod plants, and alfalfa and cotton crops. Some of these honeys are highly valued, such as sourwood honey which is produced in Southside and western Virginia. Wholesale honey prices in Virginia range from \$1.00 per pound for clover honey to \$4.00 per pound for sourwood honey. Honey is consumed by itself as well as for sweetening beverages, making honey wine (mead), cooking foods, and medicinal purposes. Other hive products such as beeswax and pollen are also commonly sold.

While honey is the most well known product of honey bees, the value of honey bee pollination far exceeds the market value of honey. Over 150 agricultural plants, perhaps one third of the food supply, are dependant on insect pollination for seed and fruit production. In a report entitled "The Value of Honey Bees as Pollinators of U.S. Crops in 2000" Roger Morse and Nicholas Calderone of Cornell University estimated the value of honey bee pollination to the agriculture industry at \$14.6 billion. The estimate was based on the increased yield and quality of fruits, vegetables, and nuts and their dependence on honey bees for successful pollination. 90 percent of apple, 81 percent of cucumber, 72 percent of watermelon, and 16 percent of cotton production is

attributed to pollination by honey bees. In Virginia, the annual value of the apple crop alone is increased by \$23 million due to honey bee pollination.

In the mid to late 1980's two parasitic mites, the tracheal and Varroa mite, were introduced into the United States. Both of these mites cause physical injury and increase mortality rates to the honey bee. Of the two, the Varroa mite has proved the most destructive causing injury to both immature and adult honey bees. Since its introduction to Virginia in 1990, the Varroa mite has spread to all bee hives in the State. The annual hive mortality rate in Virginia has increased from less than 8 percent to 31 percent since the appearance of Varroa mites. In 1996, over 90 percent of the feral, or wild, honey bee population and 60 percent of managed hives in Virginia died. In 2004, winter death of honey bee hives across the United States, including Virginia, exceeded 50 percent. The high honey bee mortality rate is attributed to direct injury and transmission of disease by the Varroa mite. The need to replace lost hives with bees from producers in other states has also contributed to the spread of honey bee pests such as the small hive beetle (SHB), and has increased the threat of Africanized honey bees (AHB) in Virginia. Also, changes in Federal regulations to allow the importation of honey bee queens and packages of bees could result in the introduction of additional pest species and diseases.

## **REVIEW OF REGULATION OF HONEY PRODUCTION**

Beekeeping and honey production are subject to federal and state laws and local ordinances. The Code of Federal Regulations (7CFR322) prohibits the importation of honey bees to prevent the introduction of exotic diseases and pests to the United States. This regulation was recently amended to allow the importation of queens and packages of honey bees from Australia and New Zealand. The Virginia Bee Law (Code of Virginia §3.1-610.1 thru §3.1-610.21) was adopted to prevent the spread of contagious diseases and pests in managed bee hives. The law requires beekeepers to report and prevent the spread of contagious honey bee diseases, which are defined as any diseases, insects, mites or other bee pests. It also requires proof that bees and beekeeping equipment brought into the state or sold in the state are free of disease. Although uncommon, local ordinances could also restrict the number or placement of bee hives in certain localities.

Federal regulations establish basic requirements for the handling and packaging of food products. 21CFR110 provides general requirements for disease prevention, facility design, storage and handling procedures, pest control, and other standards for maintaining sanitary conditions in a food processing facility. Minimum requirements for labeling information on food products are also established by federal regulations. Virginia Food Laws also address sanitary handling of food products. The Code of Virginia (§3.1-398) requires state inspection of food establishments. These facilities include any factory, warehouse, or establishment in which foods are manufactured, processed, packed, or stored for introduction into commerce. The 2002 General Assembly authorized the assessment of an annual inspection fee of \$40.00 for food establishments subject to inspection under Chapter 20 of Title 3.1 of the Code of Virginia. VDACS does not issue permits or licenses for operating any food establishments including food processing facilities; however, when inspections of such facilities are performed, inspection reports identifying objectionable conditions and food law violations are prepared and left with the food establishment manager/owner.

Generally, VDACS inspects larger commercial honey producing operations. A large commercial beekeeping operation commonly transports hives to other states for pollination purposes. Inspection and proof of disease free condition are often required by other states for bee hives shipped from Virginia for pollination or sale. Inspection of bee hives and processing facilities are conducted upon request for small honey producing operations. The rarity of bacterial contamination and complaints associated with honey products reflect the low risk to consumers from honey produced by small beekeeping operations. Consequently, VDACS receives very few requests for enforcement of state Food Laws involving small beekeeping operations.

Localities may also enforce health and sanitation standards for honey produced within their jurisdiction. Local ordinances may require honey packaging facilities, usually a beekeeper's residence, to meet specific equipment and food preparation standards. The installation of specialized equipment such as triple sinks may be required by localities in kitchens or other areas for packaging and sale of home produced food products. In these cases, construction and equipment expenses may be excessive and unrecoverable for a small beekeeping operation. Insurance companies issuing or renewing insurance policies may also require a facility processing food for sale to be inspected by a state or local food or health inspector and to comply with minimum sanitation standards.

## **RECOMMENDED PROGRAMS**

The Work Group recommends that the General Assembly appropriate \$255,000 to VDACS in order to carry out the following initiatives:

1. Develop an integrated pest management program that is tailored specifically for Virginia to address pest and disease problems affecting honey bees, particularly with regard to the occurrence of Varroa mites in bee hives. (\$100,000)
2. Support a multi-regional queen rearing program in Virginia for the production and distribution of a pest and disease resistant line of honey bees that is productive, sustainable, and free from the aggressive behavior by bees contaminated by AHB. (\$90,000)
3. Implement programs to (i) assess the risk, monitor the occurrence, and reduce the adverse impact of AHB; and (ii), educate the public as to the importance of honey bees to agriculture, environment, and the economy. (\$24,000)
4. Promote the use of honey bees by farmers to increase crop production and quality, and encourage pollination services of beekeepers so as to eliminate Virginia's reliance on the import of honey bee hives from other states. (\$41,000)

Current general fund allocations for VDACS apiary inspection program are insufficient to implement any of the four recommended programs in this study. Thus, any beekeeper assistance program desired by the General Assembly must include appropriate funding for implementation.

## **Recommended Program 1: Integrated Pest Management**

The greatest threat to beekeepers is the occurrence of the parasitic Varroa mite and other pests and diseases of the honey bee. Development of a sustainable Integrated Pest Management (IPM) program specific to Virginia to control pests and diseases will improve hive survival and reduce dependence on chemical (pesticide) control. The diverse ecological conditions of Virginia may require development of separate IPM protocol for the Tidewater, Piedmont, and Mountain regions of the state.

Needs:

- Research study on IPM best management practices for honey bee pest and disease control;
- Cooperative effort by researchers, Cooperative Extension, VDACS, and beekeepers for the development of management protocol;
- Establishment of regional research sites for developing and evaluating honey bee management techniques;
- Training programs for Cooperative Extension agents on honey bee biology and management;
- Development and distribution of information on management techniques and recommendations for prevention and control of honey bee pests and diseases; and,
- Implementing Master Beekeeper program through Cooperative Extension modeled after the Master Gardener program.

## **Recommended Program 2: Queen Breeding Program**

Currently, the majority of honey bee queens and workers are obtained from suppliers in the southern and western United States. These honey bees are often unsuitable for the climate in Virginia, are ineffective honey producers and pollinators, and perish during their first winter. In addition, most sources of queens and honey bees are located in states known to have honey bee pests, such as the SHB and AHB, which could be highly detrimental to Virginia beekeepers. A queen breeding program is needed in the Commonwealth of Virginia in order to reduce the threat of introduction of new pests and diseases and develop a more productive line of bees that is resistant to pests and diseases. A market for Virginia raised queens could be developed in other states seeking a reliable source of AHB-free queens.

Needs:

- Establishment of a queen production program to provide a local source of replacement queens;
- List of desirable characteristics for optimal queen stock;
- Protocol for verifying productivity and quality of queen stock;
- Production and marketing assistance for sale of queen stock in Virginia and other states;
- Beekeeper education and training program for successful queen replacement and improved honey bee management techniques; and,
- European honey bee certification protocol to prevent contamination of the developed line of bees by AHB.

### **Recommended Program 3: Africanized Honey Bee Response**

Since its introduction to Brazil in 1956, the AHB has steadily spread northward. In 1990, AHB entered the United States through southern Texas. It quickly spread westward to Arizona, New Mexico, Nevada, and California. Occurrence of this highly defensive and dangerous pest has caused problems for beekeepers and the public throughout the Americas. Temporary swarms are periodically found in coastal ports of several eastern states. The last reported incident of AHB in Virginia was in 2000 at Low Moor. In the summer and fall of 2005, established colonies of AHB were found in Arkansas, Oklahoma, Louisiana, and Florida. Most suppliers of replacement queen and bees to Virginia are located in southern and western states, primarily Georgia, Florida, California, and Texas. In addition, many commercial beekeepers in the eastern United States keep their hives in Gulf Coast states during the winter months. These hives are transported to other states, including Virginia, for pollination purposes. AHB will continue to infest an increasing number of commercial hives as it becomes widely established in Gulf Coast states. Commercial transport of AHB infested hives will increase the potential for accidental introduction of this pest in mid-Atlantic and northern states. A comprehensive program to train beekeepers, emergency response personnel, and the general public is needed to reduce the adverse impact of any future introductions of AHB to the Commonwealth of Virginia.

Needs:

- Risk assessment for impact of AHB to beekeepers, farmers, farm and landscape workers, and the general public;
- Monitoring program through VDACS with cooperation from beekeepers to detect occurrences of AHB;
- Interagency task force consisting of VDACS, Department of Emergency Management, Department of Health, Department of Education, and other appropriate agencies to develop response protocol and procedures associated with AHB occurrence;
- VDACS AHB Action Plan implemented in cooperation with other state and local agencies to train beekeepers and emergency response personnel in safe procedures for contending with AHB stinging incidents; and,
- Education program for school children and general public on recognition of types of stinging insects and how to avoid stinging incidents.

### **Recommended Program 4: Pollination Promotion**

The majority of Virginia's beekeepers are considered hobbyists. These individuals typically maintain 12 or fewer hives in an urban or suburban location, and their interest is in producing small quantities of honey for personal consumption. A smaller portion of beekeepers maintains hives for commercial purposes, primarily honey production. Only a few commercially active beekeepers in Virginia maintain hives for pollination purposes. The results of the beekeeper survey indicate that there is low interest among beekeepers to offer their bees for pollination. Likewise, from the farmer survey, farmers appear to be generally unaware of the benefits of honey bee pollination in increasing profits through improved harvest quantities and quality. A program is needed to encourage beekeeper participation in pollination activities and increase

farmer awareness of the benefits of honey bee pollination for enhancing farm revenue. The program will reduce dependence on out of state beekeepers to provide bee hives for pollination, reduce potential introduction of honey bee pests, and increase productivity and profits of Virginia's farmers.

Needs:

- Research on number and quality of hives needed in order to develop recommendations for adequately pollinating the various agricultural crops in Virginia;
- Recommended strength and health requirements for productive hives;
- Educational programs to promote benefits of pollination to farmers;
- Model business plan for beekeepers starting in pollination activities;
- Training programs for beekeepers and farmers for managing hives for pollination of crops; and,
- Assistance to encourage and support more beekeeper participation in pollination.

Other beekeeping issues discussed by the work group are:

- Bear damage to hive equipment;
- Rising cost of starting and maintaining bee hives;
- Hives losses from pesticides used to control agriculture, home, and public health pests;
- Research support for developing improved honey bee management techniques;
- Honey processing facilities for small beekeeping operations;
- New approaches and expansion of beekeeper training programs;
- Outreach to general public regarding beneficial features of honey bees;
- Loss of habitat and apiary sites to development and alternative land usage;
- Product safety standards for honey and other hive products; and,
- Personal and product liability insurance available to beekeepers.

## APPENDIX I

### SENATE JOINT RESOLUTION NO. 38

*Requesting the Virginia Department of Agriculture and Consumer Services to study the plight of Virginia's beekeepers. Report.*

Agreed to by the Senate, February 8, 2006

Agreed to by the House of Delegates, March 6, 2006

WHEREAS, pollination by insects is necessary for the successful reproduction of many plant species; and

WHEREAS, the typical colony, consisting of upwards of 40,000 honeybees, provides a mobile workforce that effectively pollinates many of Virginia's top agricultural commodities; and

WHEREAS, Virginia growers are increasingly reliant on itinerant beekeeping operations located outside the Commonwealth to provide adequate pollination of their crops; and

WHEREAS, Virginia's beekeeping industry is threatened by the introduction of honeybee pests and diseases such as the Varroa mite, the honeybee tracheal mite, and small hive beetles; and

WHEREAS, beekeepers are a primary resource to emergency management personnel and serve as first responders to hazardous situations associated with Africanized bees; and

WHEREAS, approximately 90% of feral or unmanaged wild bees in Virginia have disappeared since 1995; and

WHEREAS, beekeepers with 50 or fewer hives are an integral part of the beekeeping community; and

WHEREAS, the number of managed hives in Virginia has declined from 90,000 in 1984 to fewer than 24,000 in 2003; now, therefore, be it

RESOLVED by the Senate, the House of Delegates concurring, that the Virginia Department of Agriculture and Consumer Services be requested to study the plight of Virginia's beekeepers. The Department shall seek and outline possible remedies to the problems identified by the study.

In conducting its study, the Department shall examine the regulation of honey production by small beekeeping operations.

All agencies of the Commonwealth shall provide assistance to the Virginia Department of Agriculture and Consumer Services for this study, upon request.

The Virginia Department of Agriculture and Consumer Services shall complete its study by November 30, 2006, and shall submit to the Governor and the General Assembly an executive summary and a report of its findings and recommendations for publication as a House or Senate

document. The executive summary and report shall be submitted as provided in the procedures of the Division of Legislative Automated Systems for the processing of legislative documents and reports no later than the first day of the 2007 Regular Session of the General Assembly and shall be posted on the General Assembly's website.



## APPENDIX II

### Summary of Listening Session Presentations

**Presenter:** Keith Tignor, VDACS, Consumer Protection

**Topic:** Study on the Plight of Virginia's Beekeepers

- Survey Responses
  - 57 Farmers in 34 Counties
  - 286 Beekeepers responded from 82 localities
    - 256 Hobbyist (0 to 50 hives)
    - 24 Sideline (50 to 250 hives)
    - 6 Commercial (more than 250 hives)
- Farmer Profile
  - Farm Overview
    - Farms 280 acres of apples, beans, watermelon, strawberries, etc.
    - Uses 1.3 hives per acre
  - Honey Bee Pollination Usage
    - Rents hives from Virginia beekeepers
    - Satisfied with hive activity
    - Crop quality and production is improved by honey bee pollination
    - Believes honey bee is crucial to success of agriculture but nearly half do see need to use honey bee to pollinate their crops
  - Pollination Contracts
    - Verbal agreement with beekeeper
    - Pays \$45 per hive rental fee
    - Considers rental fee appropriate
  - Pollination Contacts
    - Pollination recommendations obtained from beekeeper or Cooperative Extension Office
    - Wants more information on pollination
    - Wants list of beekeepers for pollination
- Beekeeper Profile
  - Operation Overview
    - 13.8 years as beekeeper
    - 28.2 hives
    - 51.7 lbs of honey per hive
    - Satisfied with honey production
    - Does not have personal or product liability insurance
  - Satisfaction with Beekeeping
    - Interest has increased
    - Goals have stayed same
    - Costs have increased
    - Recommends beekeeping to others
  - Information Resources
    - Has adequate resources for beekeeping information

- Wants more training
- Pollination Activity
  - Honey bees are crucial to agriculture and environment
  - Low interest in pollinating crops
- Queen Management
  - Replaces queens within 3 years
  - Obtains replacement queens from another state
- Pest and Disease Problems
  - Annual (winter) hive mortality rate is unacceptable
  - Primary pest problem is Varroa mite
  - Prefers miticides and special equipment to control pests
- Beekeeper Concerns
  - Top 5 are mites, costs, invertebrate pests, queen failure, and pesticides
  - Commercial beekeepers concerned with bears and loss of habitat
- Varroa Mite Infestation Levels
  - Mite infestation levels on 2 year cycle
  - 31 % annual winter hive mortality in Virginia

**Presenter: Michael Weaver, Virginia Polytechnic Institute and State University,  
Pesticide Programs**

**Topic: Pesticide Update for Beekeepers**

- Goal of Pesticide Safety is to protect applicators, pollinators, public, and environment
- Pesticides
  - Types
    - Biologicals
    - Organophosphate insecticide
    - Pyrethroids
    - Inorganics
    - Chlorinated hydrocarbons
    - Antibiotics
  - Groups
    - Herbicides
    - Fumigants
    - Sterilants
- Registration with Environmental Protection Agency and State
  - EPA/Food, Insecticide, Fungicide, and Rodenticide Act labeling
    - Section 3 (full label)
    - Section 18 (emergency use - limited) - 2 issued for control of honey bee pest
    - Section 24c (state local need - limited)
    - Section 25b (exempted products)
  - Target pests/diseases of honey bee
    - Tracheal mite
    - Varroa mite
    - SHB
    - Wax moth

Bacterial diseases  
Protozoa

- Food Quality Protection Act
  - Sets new food safety standards
  - Tolerance reassessment eliminated several old pesticides
  - Requires re-registration of all pesticides every 10 years
- Seeking New Registrations
  - IR-4 Minor Use Clearance Program provides efficacy and residue studies to petition EPA for new product label
  - Third party labels reduce liability to registrants
- Crop Profiles & Pesticide Management Strategic Plans
  - Transition growers through FQPA
  - Assess pest management needs
  - Virginia Honey Crop Profile under review
- Avoiding Exposure to Pesticide
  - Start with safe working habits
  - Use safety systems
  - Limit amount absorbed through skin
  - Use proper dosages
- Allergic Effects
  - Harmful to some people
  - Reactions could occur after several exposures
  - May see eye and nose irritation, redness or blistering of skin, swelling or stinging sensation
- Pesticide Label
  - Label & Material Safety Data Sheet describe minimum personal protection equipment
  - Read the label
  - Determine protective equipment needed
- Protecting Public & Pollinators
  - Virginia Pesticide Safety Education Program
  - Integrated Pest Management (IPM) Education
  - Drift Mitigation Campaign
  - VDACS/VPCB/VCE/VTPP

**Presenter:** David Steffen, Virginia Department of Game and Inland Fisheries,  
**Topic:** Bear Management Program and Damage Stamps

- Black Bear Status
  - Pre-Colonial period - abundant statewide
  - By 1900 – near extinction in VA
  - 1930 - Bear listed as game animal
  - By mid-1930's SNP created and National Forest purchases
  - Mid-1940's - population recovery obvious
- Bear Density Estimates
  - 1.0 bears per square mile - Great Dismal Swamp

- 1.5 bears/sq. mi. - Shenandoah National Park
- Approximately 3 bears/sq. mi. - Rockingham County
- Beekeeper Involvement in Black Bear Management Plan
  - Beekeeper representative on Stakeholder Advisory Committee
  - Beekeepers at focus group & regional
  - Surveyed members of the Virginia State Beekeepers Association in Spring 2000 & 2001
- Goals of Black Bear Management Plan
  - Establish viable population
  - Determine Cultural Carrying Capacity (CCC)
  - Maintain habitat conservation
  - Ensure bear hunting recreation opportunities and ethics
  - Reduce citizen-hunting and human-bear conflicts
  - Ensure non-hunting recreation opportunities
  - Maintain populations are healthy & growing
- Nuisance Bear Management
  - Before 1930-1931 nuisance bears left to landowner
  - Good statewide population estimates not available
  - Population size is monitored through:
    - Annual hunter harvest
    - Number of nuisance complaints
- Damage Management Options for Black Bears
  - Compensation not effective response to bear damage
  - Most effective programs include exclusion devices, hunting program, and education
  - Most time consuming programs are public education, exclusion device, and compensation

**Presenter: Doug Saunders, VDACS, Animal and Food Industry Services**

**Topic: Regulation of Honey Processing Facilities: Authority – Laws, Regulations and Labeling Requirements**

- Virginia Food Laws
  - Inspection of any factory, warehouse, or establishment in which foods are manufactured, processed, packed, or held for introduction into commerce, and any store, restaurant or other place in which food is being offered for sale
  - Section 3.1-398.1 states inspections are required to operate food establishments
- Federal Laws
  - 21CFR110 – Current Good Manufacturing Practices in Manufacturing, Packing, or Holding Human Food states basic requirements for any food establishment
  - Requirements are general and allow significant flexibility:
    - Disease prevention
    - Plant construction and design
    - Cleanliness to prevent food contamination
    - Pest control
    - Storage, manufacturing, and handling procedures
    - Water supply and sewage disposal

### Equipment design and maintenance

- Labeling Concerns
  - Addressed both by the Virginia Food Laws and 21CFR101
  - Label contains the required information
  - Information is not false or misleading

Last complaint received for honey dealt with mislabeled honey.
- Inspection Fee
  - 2002 General Assembly reduced our annual Food Safety appropriations by \$222,000 but authorized the collection of an annual \$40.00 inspection fee.
  - This fee is assessed on any food establishment that we have under our inspection.
- Establishments Under Inspection
  - There are 34 honey packers throughout the state that are under our inspection.
  - 33 maintain their own hives and may also receive honey from other suppliers, while 1 maintains no hives and purchases honey from other sources.
  - Generally, VDACS inspects larger commercial operations.
  - Honey is a low risk food.
  - We are not out looking at every road side stand or attempting to inspect everyone who happens to sell some honey.
- Local Government Requirements
  - Many local governments authorize the operation of farmer's markets, and there are many different types of foods offered for sale through these operations.
  - Many of those farmers markets under the control of a local government will require that vendors be under inspection in order for them to sell their products.
  - A locality may require that they contact our office for inspection before they can sell their products at that market.

**Presenter: Richard Fell, Virginia Polytechnic Institute and State University,  
Department of Entomology**

**Topic: Diseases and Pests of the Honey Bee**

- Important Pests of Honey Bees
  - Varroa Mite
    - External parasite of both adult and immature honey bees
    - Feeding of the mites causes damage and vector disease to the developing bees:
    - Associated with an increased incidence of viral diseases in adults
    - Associated with new disease condition- Parasitic Mite Syndrome which can lead a rapid colony collapse
  - Tracheal Mite
    - Infest the respiratory trachea or breathing tubes of the adult bee
    - Transferred by direct contact; female mites may move to a new host after mating.
    - Feed by puncturing the walls of the trachea and feeding on body fluids.
    - Infestation stresses the bees, feeding may lead to damage of flight muscles and the presence of "crawlers".
    - Heavy infestations in winter lead to colony death, but only low infestation rates found in Virginia
  - Mite Control Options

- Synthetic chemical miticides (Apistan, CheckMite)
- Fumigants - organic acids (formic acid, oxalic acid), essential oils (thymol)
- Colony dusting - inert dusts (powdered sugar)
- Biopesticides - sucrose octanoate (Sucroside)
- Biological control - fungus *Metarhizium anisopliae*
- Cultural techniques - screened bottom boards, drone brood trapping
- Resistant stock (Russian, SMR, Hygienic)
- Diseases Affecting Honey Bees
  - American foulbrood
    - Highly contagious and lethal to honey bees
    - Can be identified in the field, with ID kits, or sending comb sample to USDA Bee Research Laboratory at Beltsville MD
  - Stress diseases of honey bees
    - European foulbrood, chalkbrood, sacbrood, and others
  - Prevention and treatment
    - Eliminate stress conditions through selection of good apiary sites and strong colonies
    - Selection of resistant stock
    - Treatment with antibiotics such as Terramycin for American Foulbrood (AFB) and European Foulbrood or Fumidil for Nosema
- Additional Pest Problems
  - Small Hive Beetle (*Aethina tumida*)
    - Introduced into the U.S. from Africa;
    - Both adults and larvae are destructive pests of honey bee colonies
    - Larvae damage comb, defecate in honey and cause honey fermentation
    - Heavy infestations may cause bees to abscond; the rapid collapse of strong colonies has been reported
    - Discovered in Virginia, identified from at least 12 counties around the state
    - Strong colonies important for control of SHB, honey supers should be extracted quickly, Gardstar (permethrin insecticide, 0.05% solution) can be used to treat ground in front of hive.
  - Africanized Honey Bee (*Apis mellifera scutellata*)
    - Subspecies from Africa, introduced into Brazil in 1950's
    - Spread throughout South America and Central America and into the U.S. in 1990
    - Aggressive bee, stings readily, more difficult to manage
    - Potential to harmful impact to beekeeping in Virginia if it becomes established
    - VDACS currently surveys for AHB; has established response plan for introductions
- Recommendations for Disease and Pest Problems
  - Continue to monitor hives around the state for disease (AFB), mites and resistance problems, and for AHB
  - Educate beekeepers in concepts of integrated pest management and encourage the use of sustainable management practices
  - Encourage the use of resistant stock (hygienic bees, mite resistant lines)
  - Work on the development of better management practices for Virginia beekeepers to insure colony productivity and colonies for pollination.

**Presenter:** Wyatt Mangum, University of Mary Washington, Department of Mathematics

**Topic:** The Need to Develop a Honey Bee Queen Rearing Industry in Virginia

- Honey Bee Queen
  - Produces all individuals in a hive
  - Responsible for successful honey production, pollen gathering, and pollination activity
  - Determines behavior of hive, especially excessive defense in AHB
  - Replaced every other year from producers in southern states and California at cost of \$12 each
- Demand for Queen Production in Virginia
  - Most beekeepers looking for local queen supplier
  - Queens from southern states not effective in Virginia
    - Produce more brood and less honey
    - Lower winter survival
    - Shortened life span
    - High failure rate
    - Low resistance to pests and diseases
    - Threat of new pests
- AHB Threat
  - AHB spreading in southern Gulf coast states
  - Reputation for stinging in large numbers
  - AHB established in Florida and other queen producing states
  - Introduction will be detrimental to beekeeping greatly reducing the number of beekeepers
  - Beekeepers feel vulnerable and helpless against AHB
  - Need beekeepers as resource to reduce impact of AHB and assist public
- Description of Queen Production Program
  - Selection for stock
    - Gentle
    - Pest and disease resistance
    - Winter tolerance
    - Longevity
    - Production (honey, pollination)
  - Artificial insemination to control mating
  - Certification for AHB-free bees
- Benefits of Queen Production Program
  - Beekeepers obtain locally produced, high quality queens
  - Farmers have increased resource of gentle bees for pollination
  - Market for queens in other states would increase income of Virginia beekeepers

**Presenter:** Patricia Haskell, Beekeeper Association of Northern Virginia, Northern Virginia Teaching Consortium

**Topic:** Teaching New Beekeepers in Northern Virginia

- Courses Being Taught
  - Practical Beekeeping Class for Beginners
  - Queen Bee Rearing Project
  - Intermediate Beekeeper Classes Being Planned
- Reason for Classes
  - To fill a need for beekeepers
  - Only way to start/build/sustain beekeeping club
  - A way to educate non-beekeepers
  - To encourage further education
    - “Virginia” Master Beekeeping Program
    - Master Beekeepers (ala EAS)
  - To build a sustainable network for support and education of beekeepers
- How Classes are Taught
  - Consistent and uniform teaching methods and materials across all targeted classes and locations
  - All students assigned a mentor (Key to this teaching program)
  - Encouragement of family and youth participation
  - At least one hands-on field day, usually more
- Results of Program
  - Classes in 11 counties (and several city jurisdictions)
  - 125-150 paid units/year – 300 individuals
  - Four new Beekeeping Associations
  - New 4-H Club devoted entirely to Beekeeping
  - Meets educational mandate of EAS
  - Increase in pollination/honey production
- Challenges for the Future
  - Arrival of AHB
  - Local, State, Federal organizations have shown little interest and/or ability to support beekeeping education & research
  - Retention or “survival rate” for beginning beekeepers is lower than desired
  - Need to look for grants or other funding sources. Considerable out-of-pocket costs for instructors

## **Public Comment Period**

### **Alan Fiala, Virginia State Beekeepers Association**

- Asked a series of question for clarification of the surveys;
- More farmers are needed to participate in the study;
- The state needs to address AHB and implement VDACS’ action plan to educate public on importance of honey bees and benefits of having beekeepers, as well as the importance of public health and safety;
- A knee-jerk reaction by local or state governments to prohibit beekeeping if AHB is found in Virginia would be detrimental to everyone; and,
- It would be prudent to encourage the legislature to pass specific legislation removing the ability to regulate beekeeping from the local level.



### **Gene Riddle, Beekeeper**

- Beekeeping is in dire shape;
  - Costs are escalating
  - Bees are dying
  - Pollination is a hard job
  - Bears are a costly, time consuming, persistent problem
- If something is not done soon we will loose beekeeping in the state. The State needs to improve management options and recruitment of new beekeepers; and,
- Funding support is needed for beekeepers.

## APPENDIX III

### Beekeeper Survey Responses

Number of beekeeper surveys received: 288

1. In which County(s) or City(s) is/are your apiary(s) located?  
82 localities
2. How long have you been keeping bees?  
13.7 years (average)
3. How many hives do you currently manage?  
28 (average)
4. What is the annual production of honey from these hives (i.e. pounds per hive)?  
51.7 lb/hive (average)
5. Are you able to adequately sell or otherwise dispense with honey obtained from your hives?  
Yes 220  
No 22

Comments received (number):

- Need for assistance in expanding marketing honey (10)
- Need to develop cooperative extracting and marketing centers (3)
- Just starting in beekeeping (2)

6. Over the past 5 years has your interest in beekeeping:  
Increased 151  
Stayed same 107  
Decreased 18
7. What is your immediate goal regarding the number of bee hives you currently manage?  
Increase 101  
Stay same 164  
Decrease 13
8. Over the past 5 years has the cost of maintaining your hives:  
Increased 172  
Stayed same 58  
Decreased 4
9. Would you encourage others to take up beekeeping as a commercial endeavor or hobby?  
Yes 159  
Yes, hobby 116  
No 7

Comments received for not recommending beekeeping, particularly as a commercial endeavor (number):

- Expense and low profit margin with commercial beekeeping (7)
- Personal and financial challenges (3)
- Lack of information on disease and pest problems (3)
- High labor requirement (1)

10. Are adequate resources (i.e. literature, workshops, beekeepers, inspectors, extension agents) available in your area to provide assistance in dealing with problems in your hives?

Yes	215
No	59

Comments received (number):

- Improved training and access to a Cooperative Extension agents (21)
- Increase the number of apiary inspectors (17)
- Establishing local network or association of beekeepers (15)
- Conduct local workshops or other training program (11)
- Provide books to local libraries (4)
- Local sources of replacement queens (2)
- Promote new approaches in distribution of information, i.e. email, website (2)
- Establish equipment supply and distribution locations (1)
- Assistance in marketing honey, i.e. Farmers market (1)
- Assistance with disease and pest prevention and treatment (1)
- More involvement by the state (1)

11. Do you have an interest in participating in a beekeeper training program (i.e. Master Beekeeper)?

Yes	181
No	97

12. Are you satisfied with the honey production and health of your hives (i.e. frames of bees, amount of honey produced)?

Yes	172
No	93

Reasons provided for dissatisfaction (number)

- Mites, wax moth and other invertebrate pests (21)
- Queen quality and supply (18)
- Poor management techniques (15)
- Over winter survival (11)
- Decrease in nectar sources (9)
- Diseases (4)
- Swarming activity (4)
- Bears (2)

- Defensive behavior of bees (1)
- Pesticide poisoning (1)

13. How would you characterize your annual losses of honey bees or hives to diseases, pests, or environmental conditions?

Acceptable	98
Moderate	80
High	52
Severe	23

14. Do you consider either diseases or pests of honey bees as persistent problems in your hives?

Yes	167
No	91

Disease and pest problems noted in responses (number)

- Varroa mites (76)
- Mites (56)
- Wax moth (21)
- American foulbrood (8)
- Tracheal mites (8)
- Bear (7)
- Small hive beetle (7)
- Viruses (6)
- Ants (3)
- Parasitic mite syndrome (2)
- Disappearing queens (2)
- They just die (2)
- Persistent diseases (1)
- Mouse (1)
- Environmental (1)
- Raccoons (1)
- Insecticide spraying (1)

15. Do you believe the current treatment options (i.e. medications, pesticides, genetic resistance, and equipment) for controlling diseases and pests of honey bees are sufficient?

Yes	126
No	129

Alternative control options requested (number):

- Queens resistant to mites and diseases (21)
- Organic or biological alternatives (17)
- New miticides and medications (15)
- Integrated Pest Management recommendations (12)
- Research on treatments alternative (10)
- Unknown (9)

- Education and training for managing disease and pest free bees (4)
- Assistance from state (4)
- New equipment (2)
- Less costly alternatives (1)
- Ability to shoot bears (1)
- Different changes for our state (1)
- Virus control(1)

16. Rank the top 5 concerns from the list below for you as a beekeeper or to your honey bees with 1 as the greater concern and 5 the lesser concern.

<u>Concern</u>	<u>Number of Responses</u>	<u>Average Rank</u>
Parasitic mites such as Varroa and Tracheal mites	249	1.77
Cost of equipment, queens, packages, other beekeeping supplies	158	2.70
Invertebrate pests such as SHB, Wax moth and AHB	144	2.86
Queen failure	138	2.62
Pesticides applied to control mites in a beehive	117	2.75
Pesticides applied to crops, lawns, or other large areas	109	2.69
Diseases such as American Foulbrood, Nosema, and Chalkbrood	107	2.78
Development and urbanization	87	2.96
Bear or other large vertebrate animal (skunks)	61	2.90
Federal, state, or local regulations and ordinances	56	2.98
Available apiary sites	38	3.76
Interstate movement of honeybees for pollination purposes	37	2.81
Liability Insurance	37	3.00
Other(s):	11	3.00
Vandalism	8	3.38

Note: Additional concerns listed by beekeepers in the responses to Question 16 were:

- Allergic reaction to bee sting
- Ability to purchase viable packages
- Education
- Educational complacency
- Flooding
- Government financial assistance
- Irrational fear of bees incites legislation
- Public perception
- Time
- Winter loss

17. Which of the following do you typically use to control pests in your hives (i.e. mites, SHB, ants, wax moth)?

Miticides	173
Natural Oils	101
Powders	94

Genetics	83
Equipment	170
Management	104
Other:	5
Viable packages	
Swarming	
Strong bees	
Small cell foundation	
Mint leaves	

18. How often do you requeen your hives?

Frequently	44
Regularly	114
Infrequently	70
Never	28

If you requeen your hives, where do you obtain your queens?

Raise own	54
Local	43
In-State	14
Out of State	168

19. Are your hives rented or used in pollination of fruits, nuts, vegetables or other crops?

Yes	28
Yes, no fee	33
No	212

20. Are you able to fulfill pollination requests (i.e. orders, number of hives) from farmers contacting you?

Yes	28
Sometimes	14
No	16

21. Are you satisfied with pollination fees currently received for your hives?

Yes	28
No	5
No fee	24

22. How important is honey bee pollination to the success of agriculture and the environment?

Highly	248
Moderately	8
Not	0

23. Do you have insurance for product liability or injury from bee stings to neighbors, visitors, or employees?

Personal injury	33
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Product liability	16
No	227

Additional comments on issues or concerns taken directly from beekeeper survey responses:

- The City of Norfolk has an unreasonable restriction on beekeeping. Beekeepers need 5 acres of land to keep bees in Norfolk. This amounts to a total ban on beekeeping. Too bad the State reps don't help. I think it establishes a dangerous precedence.
- I would like the State Budget to include money for more inspectors to monitor the movement of bees through the state, and help all beekeepers to become more interested in using the best possible practices and management skills.
- I think there should be additional studies on the nutritional requirements of honey bees.
- I am reducing the amount of pollination I do (age). I don't see the opportunities for young people to build up their beekeeping operations to reach a self sustaining profitable role.
- Would like to see queens available on a state program, or readily available source.
- I am very new to beekeeping and have had an enormous amount of help from members of our beekeeping society. It would be helpful to have state agents available to meet at our hives (understandably infrequently).
- Promote or provide queen rearing operations locally to keep southern/africanized bees at bay. Create an ethyl bromide(?) chamber to "cleanse" hives in.
- Results of research using *Metarhizium anisophilae* fungus spores to control varroa. Public awareness campaign regarding Africanized bees.
- The requirement to register and have inspection of honey production space is troublesome for small honey producers. Fee is also a discouraging element. With possible Africanized bees coming, I worry about liability issues.
- I would welcome annual inspections either by a state apiarist or local master beekeeper reporting to apiarist. I'd also like to see a facility in VA for rendering old comb as I am using all new foundation to eliminate the virus reservoir in my equipment.
- I keep my bees mainly for pollination purposes. We have a very large garden. We have been very pleased with the results in terms of increased production of the garden, raspberries and strawberries particularly.
- For me beekeeping is a hobby. I do it to provide myself, family and a few friends with honey. Because of the cost of maintaining bees and the pest problems I do not think I would consider increasing my production to a commercial level.
- I feel that a website "local calendar" of what is occurring or should be occurring at a given time, i.e. honeyflow, time to chemically treat for mites, time to flip brood chamber to the top or bottom ... etc. would be a valuable tool for beekeepers.
- I will attempt pumpkin pollination in July this year. I have not done pollination before due to lack of hives and my availability.
- Virginia needs to get more aggressive at regulating and supporting the local beekeeper.
- The colonies die in winter despite ensuring sufficient honey supply. Availability of check list with dates of actions to be taken on bee hives throughout the year.

- I keep 1 observation hive on a 1/4 acre suburban lot. The neighbors are OK with it. My source of expertise is BANV. I have little experience with state-sponsored resources, except email exchanges with Keith Tignor, and 1 state beekeeping meeting.
- I would provide pollination services to local farmers, but the cost of equipment is simply too high. Virginia should provide some kind of cost sharing since increased agricultural production as the result of pollination services benefits the Commonwealth.
- It would be good if we had a bee inspector for this county. The state help with medication to me get the mites under control.
- How about emailing out the plan for dealing with the Africanized Honey Bee that I've heard about?
- More education available on a local level. Incorporate basic beekeeping into agricultural training in high school. Encouragement for local businesses to buy local honey for resale.
- I feel that honey bees should be considered like an endangered bee and the government of our state should think of them this way.
- I would requeen if queens were available locally.
- I am a farmer who raises a few bees for home honey consumption. Time, finances, and personal energy are limiting factors. However, I appreciate your efforts to help all beekeepers.
- I am no longer a beekeeper due to my health and age.
- Get young men to keep bees.
- Info on processing honey would be helpful. Financial assistance from tobacco money, etc. Finding supplies locally is a problem. Local bee club has been most help. County Ext. agents are no help. Keith Tignor does a great job with available resources.
- Some kind of local market for bulk honey sales. Information on better treatment methods for bee mites. Better information to public on importance of beekeepers to home gardener let alone big growers. Beekeepers seem to slip through the crack somewhere.
- I no longer keep bees.
- Not sure if homeowner's insurance would provide any insurance coverage.
- Local (region or state) resources for queens, nucs and packages are needed! Also, state-sponsored or supported training education of beekeepers.
- Need more information on insurance options.
- Local game warden favors bears over destruction of hive and killing of bee family. Power company does not give "a hoot" about bees when it comes to pesticide spraying.
- Beekeepers course would be helpful.
- I am entranced with beekeeping, and am hoping to ramp up to 15+ hives. I will probably need resources on how to sell my honey at that point. Maybe regional honey co-ops or pollination co-ops?
- I only have two or three hives on five acres by my garden.
- Today the beekeeper has to provide a constant managing program in order for his bees to stay alive from one year to the next. There are no more wild honey bees. If you see a honey bee on a flower or fruit blossom it came from a beekeepers bee yard.



- Hives should be requeened every year, but I can't afford it. I can't afford to buy insurance to cover beekeeping activity.
- I would like to see good queens raised locally available for purchase. I plan on attempting to raise queens next year. But not sure of my chances of success. Our honey farm is incorporated providing liability protection.
- Really want local bees (queens).
- We need more assistance in training as more information is known, such as really safe uses of pesticides for both the bee and the beekeeper.
- The biggest help would be to have an available person to call or to come see the issues while I'm dealing with them. Books don't seem to answer specific questions (frames, honey super storage, queen failure). Beekeeping is a financial drain.
- We try generating business for pollination by advertising. No one seems interested. Pollination is a cost local farmers avoid or wish away. We need to get to the serious growers & find out why they are not interested. Ext. agents don't care about bees.
- I am very proud of the beekeepers course that our W. Central Beekeepers Association puts on.
- Develop a waxmoth trap similar to the Japanese beetle to control this pest.
- There are no professionally raised queens in Virginia. Insurance is too expensive.
- Need state and federal support for continuation and expansion of the Beginning Beekeeping teaching program that has been so successful.
- I am very nervous about lack of insurance. I would like to see the insurance through the VSBA.
- Insurance is a big problem.
- Absconding prevention.
- I read on the internet about a program in NC which helped people get started, increase hive numbers, etc. I am disappointed with information from and lack of workshops at VA Tech. VA beekeeping websites are hard to find.
- Queen rearing project.
- Public awareness programs of importance of bees.
- Virginia State Beekeepers Association needs to do more outreach to new hobbyist beekeepers. A welcome letter or email. I volunteer to help in this process.
- State legislation that prohibits local jurisdictions from prohibiting beekeeping or the ownership of bees or transport of bees.
- Need ability to obtain local bred queens and sugar in quantity.
- I plan to begin requeening every 2 years based on advise from Central Virginia Beekeepers.
- But, why do my queens die? Pesticides, environment, unknown reason?!? We beekeepers need to be more proactive statewide. We need to model ourselves after North Carolina, and other progressive states.
- Need information on this insurance and liability.
- Need locally raised queens with attention to genetics.
- After the petal falls from my fruit trees, I have not been able to spray for pests or disease due to bees. Have only found 1 spray (organic) but this is no longer sold.
- Make grants and funds available for associations to use to interest people in beekeeping in Virginia.

- Improved availability of state apiarist to solve problems. Need statewide publicity made available to citizens as to the importance of bees and how they impact our daily lives. Value of raw honey to ones general health and our economy.
- Need a state apiarist to be used as a resource that is more available. Education of the public.
- I cannot stress enough the importance of honey bee pollination. This function is the main reason I became a beekeeper.
- We need better assistance from Dept. of Game and Inland Fisheries to get control on the bear damages. We need a damage stamp program started in every county. If the bears are so sacred to the human and DGIF then help beekeepers protect the honey bee.
- Lost all hives when mosquito man killed them.
- Must now treat more and work with bees more.
- Have had health inspector come to home for inspection. (Cost \$40.00 per year.)
- Looks like diseases are here to stay.
- I am 1 of 4 people at a community garden keeping bees. The primary purpose of our hives is pollination of the garden as well as the entire neighborhood. There are reports of bees, almost certainly ours, from all over the immediate area.
- Concerns: Reasonable insurance for small beekeeping operation.
- Insurance: Yikes! Do I need it? My husband will make me give them away! ACK!
- Cancelled insurance due to high cost. Local farmer not planting pumpkin patch due to lack of honey bees for pollination. We experienced a high rate of loss after renting hives out for pollination. We do not know cause and no longer rent bees.
- Our club meets each month with more information than other clubs. We are luck in the SVBA. And, we cover a large amount of area (counties). Some clubs only meet once every 3 months and they only have a tupe(?).
- Notification for any state pesticide spray.
- I would like to see research done on how and why powder sugar/garlic/thymol oil helps control mites & diseases. We have limited but strong convictions on why they work. We would like to have our reasons scientifically verified or disproved.
- The availability of an autoclave to sterilize contaminated equipment would greatly enhance our ability to reuse questionable equipment, rather than resorting to destruction.
- Mites are a worldwide problem. There must be worldwide cooperation to eliminate them. I am out of the bee business.
- This is a great survey. We need more beekeepers in our state. With grants or financial help for getting started and retaining and adding hives, we would have more people interested in beekeeping. This can be an expensive hobby, but a fun one.
- Focus state agencies on major problems confronting beekeeping in state. VA Tech research does not seem closely aligned to the practical bee issues and threats to beekeeping in state. If VA beekeeping gets Africanized or otherwise reduced to a vestigial condition, someone is going to eliminate offices and schools connected with bees.
- As a hobbyist beekeeper who works, I have little time to inspect/manipulate my hives. Main problem April-July is swarming. How can I prevent swarms if I can't always watch them closely from week to week and make timely adjustments?

- This is my first season so I don't yet know what I don't know. I hope to be more informative in your next survey. I started with 3 hives this spring. One lost its queen and was soon raided by one of the other hives. I'll set up a new 3rd hive next spring
- We beekeepers need to be more proactive statewide. We need to model ourselves after North Carolina, and other progressive states.

## APPENDIX IV

### Farmer Survey Responses

Number of surveys received: 57

1. In which County/City is your farm located?  
34 localities
2. Do you rent, own beehives, or otherwise use honey bees to pollinate your crop?  
30 farms report using honey bees for pollination
3. How many acres of your farmland require honeybee pollination?  
280 acres
4. What crop(s) do you raise that benefit from honeybee pollination (i.e. apples, peaches, cantaloupe, watermelon, strawberries, cotton, green beans)? Please, list all relevant crops.
5. What is your annual production for the crop(s) listed in Question 4 (i.e. bushels per acre)?
6. How many hives per acre are used in pollinating your crop(s) (list hive/acre for each crop)?  
1.3 hives per acre (average)
7. Who determines the location for placing hives within or around the crop(s)?

Farmer	6
Beekeeper Locates	11
Mutual Decision	12
8. Where do you obtain honeybees for pollination purposes?

Rent Hives	14
Loan or no fee	8
Own Hives	8
9. What is the origin of the beehives used for crop pollination on your farm?

Local	21
In State	6
Out of State	4
Unknown	0
10. Are you able to find a beekeeper to provide hives to pollinate your crop?

Yes	21
Too few hives	3
Most of the time	1
No	0

11. Do you have liability insurance specifically for injury from insect stings to farm workers or visitors?

Yes	6
No	19

12. Are you satisfied with the pollination activity or strength of the hives used in the past (i.e. number of bees observed on the crop or frames of bees)?

Yes	25
No	2

Comments:

- Would like more honey, pollination is ok

13. Is the quality of your crop better (i.e. fewer culls) as a result of using honey bee pollination?

Yes	16
No	0
Unknown	11

14. Has your crop production (i.e. bushels per acre) improved as a result of honey bee pollination?

Yes	15
No	1
Unknown	11

Comments:

- Always use bees

15. Do you know if the hives were inspected or certified for health or pollination strength?

Yes	4
No	22

If your answer to question 15 is "YES", who performed the inspection or certification?

Farmer	1
Another beekeeper	0
Apiary Inspector	3
Other	0
Unknown	0

If "NO", is this a service that might be beneficial to your farm operation?

Yes	8
No	9

16. Are you generally satisfied with work performed by the beekeeper(s) providing hives?

Yes	24
No	0

17. What type of agreement do you have with the beekeeper for pollination services?

Written	1
Verbal	18
None	5

18. What type of compensation or other exchange is involved in your pollination agreement with the beekeeper?

Monetary	15	
Barter	2	
In kind	7	
Other	1	Buy honey from beekeeper
No payment	3	

19. What fee do you pay per hive (i.e. dollars per hive, pounds of produce) for pollination services (include rates and type of crop for each crop)?

Average rental fee: \$45

20. Over the past 5 years has your cost of renting hives:

Increased	8
Stayed same	6
Decreased	0

21. With regard to any benefit resulting from honey bee pollination of your crop(s) is the rent fee:

Bargain	4
About right	8
Too expensive	3

22. Is your crop(s) surveyed during bloom to determine the density and type of bees and other pollinators present?

Yes	14
No	11

23. Would a regional or statewide list of beekeepers offering pollination services be of benefit to your farming operation?

Yes	18
No	7

If your answer to question 23 is "YES", which format is preferred?

Printed	15
Internet	5
Email	4
Other	0

24. How important is honey bee pollination to the success of agriculture and the environment?

Highly	49
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Moderately	7
Not important	0

25. What is your main source of information for crop pollination recommendations?

Beekeeper	27
Cooperative Ext.	26
Field Day/Demo	3
Internet	2
Publication	12
Classes	3
Other:	4
Own knowledge	
Past history	
I was a beekeeper 15 years ago	
Nature's own	

26. If offered, would you likely attend demonstrations or workshops on crop pollination in your area?

Yes	34
No	17

27. Do you use an insect pollinator other than honey bees to pollinate your crop?

Yes	10
No	40

Other insect pollinators used:

Bumble bee	8
Mason bee	3
Orchard bee	3
Other:	1

Native pollinators

28. If you do not use honey bees or other insect pollinators on your crops, what is the reason?

No need	15
No beekeeper	3
Too expensive	0
Additional work	2
Health & Safety	0
Other	0

Additional comments on issues or concerns taken directly from farmer survey responses:

- Raise Christmas trees.
- I would like to have classes on actual beekeeping procedures. I have to depend on information I get by asking people that have previous beekeeping experience.

- Use native pollinators
- Wild bees do well.
- Stopped growing crops requiring bees.
- The insect population has pollinated this orchard for 25 years satisfactorily.
- Do not grow any more vegetables.
- Beekeeper is 85 years old.
- I do not have a farm or crops as such, but do have a fairly large garden. I appreciate your interest and work in helping beekeepers. Bees are vital to our crops and for honey.
- I sold my bees in 2002.
- We are currently searching for a local beekeeper to see if we can get hives for our farm.
- I have a large number of bumble bees.
- We use bees for educational purposes.