

CRANBERRY CROP AND PEST MANAGEMENT PROGRAM: PROPOSAL FY02

In response to the dire state of the industry, studies will focus on the impact of crop-destruct floods during bloom on pest populations and crop production. Work will continue to find answers to managing resistant populations of cranberry weevil. We also plan to develop low-cost pest management alternatives to assist growers through the current economic crisis. Projects proposed for the 2002 season include the continued development of first (evaluation of new materials for pest management), second and third level (e.g., cultural management strategies such as flooding) IPM strategies for the industry. Results of research projects will be included in the Cranberry Chart Book, newsletter articles, oral presentations at grower meetings, trade magazine articles, and refereed publications.

PROPOSED RESEARCH

Pest and Crop Management Implications of Reducing Crop Load to Restore Economic Viability

Taking bogs out of production: Effect of flooding to remove bloom on yield and pest populations. A.L. Averill, F.L. Caruso, C.J. DeMoranville, H.A. Sandler, M.M. Sylvia, and J. Mason. Project timeline: 2001-2006. *IPM Program funding would partially support this research.*

In an effort to accommodate the 15-38% set aside mandated by the USDA, growers needed a way to avoid harvesting their crop on selected farm acreage. To eliminate fruit production, substantial cranberry acreage was taken out of production in 2000-01 through the use of a flood during bloom and early fruit set. It is anticipated that the oversupply of fruit will continue for several years, thus growers will need to engage in planned crop-destruct programs. An estimated 30% of growers took acreage out of production with crop-destruct floods during bloom in 2001.

We propose to evaluate productivity of flooding at paired (flooded and not flooded) demonstration sites in the year following the bloom flood. Populations of the key fruit pests and impact on cranberry weevil (see proposal below), will be monitored to evaluate any management ramifications from this practice. Likewise, levels of fruit rot fungi will be assessed with a view toward reduced fungicide applications (see proposal below). Impact on weed populations will be assessed by quadrat sampling. Horticultural impacts, particularly yield and bud set, will also be quantified.

Evaluating the impact of reduced management inputs. A.L. Averill, F.L. Caruso, C.J. DeMoranville, H.A. Sandler, and J. Van den Heuvel. Project timeline: 2002-2006. *IPM Program funding would partially support this research.*

Cranberry growers are trying to remain economically viable in the wake of drastically reduced incomes. One method has been to minimally manage a portion of their acreage by reducing chemical and labor inputs. Research will be pursued to determine the horticultural and pest management ramifications of these choices. Of particular concern will be increased problems with (previously) minor pests, such as black-headed fireworm and Phytophthora, long-term management of perennial weeds, and management of fruit rot fungi. Also, fruit and bud set issues and vine canopy changes will be assessed. A new staff member, an environmental physiologist, will examine changes in water use on vine health and other

physiological concerns. Projects started in 2001 that will continue for the next few years include: 1) Continued studies on optimal fungicide timings: Can two fungicide applications sufficiently control field and storage rot?; 2) Investigation of possible resistance development by fruit rot pathogens to two new fungicides: Plots utilized in 2001 will be continued in 2002 and 2003; and 3) Effect of reduced management on the incidence of the fruit rot fungi: Studies will be continued in certain locations, depending on the impact of 2001 insect infestations.

Monitoring Critical Issues for Cranberry IPM

Integrated management of cranberry insect, weed, and disease pests using fall and spring floods. Funding from: SARE Project. Research Cooperators: C.J. DeMoranville (PI), [alphabetical order] A.L. Averill, F.L. Caruso, H.A. Sandler, D. Shumaker, and M. Sylvania. Fall, 1998-November, 2002. *IPM Program funding would partially support this research. 15% of the Cranberry Specialist salary is used as matching funds for this project.*

Studies will be concluding on the investigation of using cultural techniques, such as fall floods, for control of dewberry (*Rubus hispidus*) populations and other cranberry pests. Several demonstration studies were conducted from fall of 1999 through the present on growers' bogs. Using paired sites (flooded and nonflooded), we have collected data from several sites. As in 1999, hibernacula of cranberry fruitworm will be buried at various sites. Phytophthora populations will also be monitored in 2002. Additionally, one pair of beds includes one receiving a trash (removal) flood and one receiving no flood. Populations of fruit rot fungi will be compared. Horticultural aspects will be monitored throughout the course of the project. A set of recommendations forming the basis of an integrated management plan for control of dewberry will be developed.

Impact: Implementation of a cultural practice that will manage pests and reduce pesticide inputs.

Management of resistant populations of cranberry weevil (*Acrobasis vaccinii*) populations. A.L. Averill and M.M. Sylvania. Project timeline: 2001-2004. *IPM funds requested for a summer assistant: \$5000.*

This project will have two main foci: 1) Evaluation of flash floods in the spring on weevil adults: In past studies, we determined that overwintered cranberry weevil adults move onto the bog in mid-May to feed and oviposit. We propose to quantitatively evaluate the effect of a 1-day flood following the arrival of adults on the cranberry bed. We will examine both mortality and possible movement of adults off the flooded bed. 2) Evaluation of crop-destruct floods on weevil immatures: Growers are lowering fruit production through crop-destruct floods at early bloom. At the point that these floods occur, cranberry weevil eggs and larvae are developing within cranberry buds. Mortality of immatures via flooding will be assessed. If flooding affects survivorship of cranberry weevil immatures, a grower could select a bed with the worst cranberry weevil infestation as the crop-destruct location in order to meet set-aside limits.

Viability of Alternative Crops for Cranberry Farms

Feasibility Study for Alternative Cropping Systems for Cranberry Bogs or Associated Uplands. Part 1: Off-season strawberry production. H.A. Sandler cooperating with S. Schloeman (UMass Extension) and J. LaFleur (Cape Cod Cranberry Growers Association). *A portion of the funds requested in Cranberry Budget Proposal for the Cranberry Specialist's salary will be utilized*

as matching funds to support labor and research efforts for this project. Matching funds are needed to secure monies from the granting agency, MA DFA Agro-Environmental Technology Grants Program.

The current economic crisis for the cranberry industry impacts the production area in several ways. In addition to the loss of revenues that support the livelihood of many people in Southeastern MA, this downturn also portends of the loss of land as open space and wildlife habitat to commercial or residential development. Growers need information on all possible options that will enable them to remain economically viable. Many growers want to maintain their farms and are willing to try options previously thought to be unreasonable. This project will initiate the evaluation of four crops either as alternatives to cranberries or as supplemental crops. The first crop to be evaluated will be dayneutral strawberries.

Due to its location in the center of the cranberry production industry, the Cranberry Project Leader (CPL) at the Cranberry Station would be logistically able to facilitate site visits and communications with the cooperating growers. Four sites have already been identified for the establishment of an annual dayneutral evaluation trial. Criteria will be developed to identify successful sites. The CPL would be responsible for supervising a summer research technician who would be assigned to carry many of daily activities associated with the project. In addition, the CPL would communicate as needed with Schloeman and cooperating growers to achieve the short-term and long-term projects objectives. The full-length proposal is available in Appendix A-10.

Feasibility of Converting Portions of Cranberry Farms Systems into Fish Aquaculture. H.A. Sandler cooperating with D. Leavitt, Aquaculture Specialist, Southeastern Massachusetts Aquaculture Center (SEMAC), and B. Morse (cranberry grower). *IPM funding would partially support this project.*

Massachusetts growers are searching for different ways to keep their farms viable. For some cranberry owners and growers, fish farming may provide an alternative source of income. An innovative pilot project in Rochester, MA is utilizing southern catfish farming techniques and adapting them to fit northern environmental conditions and species. The CPL will interact with the Aquaculture Specialist and the cranberry grower to provide expertise in pest management and production issues as needed. In addition, the cooperators in the project will provide updates and reports on the feasibility and problems associated with the project as it progresses.

Integrating Cultural and Production Practices for Pest Management

Weed and cranberry vine health in fields receiving repeat pre-emergence herbicide applications. (H.A. Sandler). Project Timeline: 2001-2004. *IPM funding would support this project.*

The long-term use of pre-emergence herbicides is thought to detrimentally affect the root systems of cranberries. A study will be continued to compare vine and weed health in areas that are not (and will not be) treated with pre-emergence herbicides to areas that will continue to receive pre-emergence applications (low-end and high-end rates). One commercial farm is being used for the study. Annual weed surveys will be conducted and vines samples and root measurements will be collected to assess vine health. This is an on-going project.

Impact: Answer questions related to the impact of chronic herbicide use on crop productivity versus weed management benefits.

Implications of vine density and nutrient application on weed management. (H.A. Sandler). Project Timeline: Spring 2000-2003. *IPM funding would support this project.*

As part of a long-term project to determine the best way to manage nutrient levels, planting density, and weed management alternatives, a long-term study was established on State Bog in the 2000 growing season. Four vine planting densities and four nitrogen levels will be evaluated for effects on weed invasion. In addition, both nonchemical and chemical weed control options will be evaluated over the course of the study (projected to be conducted through at least 2001). The economics of the various management decisions will be developed and evaluated as well. Movement of nitrogen in the subsurface water will be monitored to further our understanding of how nutrients move through the cranberry bed.

Impact: The information garnered from this research will be of particular import when growers attempt to reclaim and renovate neglected farms. In addition, it may also develop foundation of information for new planting weed management with reduced use of herbicides.

Soil pH - interaction with cranberry nutrition and weed populations. (C.J. DeMoranville and H.A. Sandler). Project Timeline: 2002 for weed survey, 2002-2006 for S study. Partially funded by Hatch project. *Half-time assistant requested with IPM funding: \$2600.*

Soil pH has the capability of affecting the distribution of plant species. Many weed species are best adapted to occur in a narrow pH range. Because cranberries are adapted to low pH, they may be able to better compete with pH-sensitive weeds if the bog is maintained at a pH around 4.0 or less. In a MA survey of cranberry bog soil pH and yield, we found a weak relationship between lower pH and higher cranberry yield. This indicates that lowering soil pH for weed control may actually benefit the cranberry plants beyond the benefits of decreased weed competition. If soil pH lowering is to be used as a viable weed management tool, the effects of low pH on cranberry yield and nutrient status must be fully understood. Further, the addition of sulfur in itself may have an impact on the cranberry plants.

Soil pH of cranberry beds will be evaluated at 30 locations and compared to five-year yield average. Weed surveys will be conducted at these same sites using standard cranberry weed mapping techniques, especially look for cinquefoil (*Potentilla* spp.), clover (*Trifolium* spp.), and vetch (*Vicia* spp.). At a site with soil organic matter in the common average range for MA beds, rates of sulfur (granular, elemental) will be compared - six S treatments (none, 80 lb./A - 3 applications, 250 lb/A - one application, 250 lb/A - two applications, 250 lb/A - three applications, and 500 lb/A - one application). Single applications will be applied after the danger of frost has passed in the spring. In multiple-application treatments, subsequent applications will be made every 4 weeks.

Impact: May develop into a tool for weed management with reduced or eliminated herbicides.

Evaluation of sand stockpiles as significant sources of the seed bank of cranberry weeds. (H.A. Sandler and J. Mason.) Timeline: Winter 2000-Fall 2002. *IPM funding would support this project.*

This study is evaluating the role of sand piles in the life cycle of weed seeds in the cranberry production area. In 2000-01, the approach for this project involved quarterly sampling (spring, summer, fall, and winter) of sand piles located on commercial bogs in MA as well as New Jersey, Wisconsin, and Washington. Our sampling technique was very simple to perform and provided both qualitative and quantitative data. The last sampling is planned for Fall 2001. Labor will be needed through the early summer to process and identify all seedlings. Additional labor will be needed to analyze the data and compile results.

Impact: Herbicide inputs and labor costs would be lowered due to lower initial weed pressures. Growers could make better management decisions if they could identify potential weed seed sources and/or potential weed seedbanks prior to sand application. This may develop into a tool for weed management with reduced or eliminated herbicides.

Water Quality Initiatives

Phosphorus fertilizer in cranberry production: can the case be made for low rates and alternative application methods? (C.J. DeMoranville). Project timeline: 2000-2003. *IPM funds would support half-time summer assistant (\$2600).*

The purpose of this research is to add to our knowledge of lowest effective P rates in cranberry production to support production recommendations in the face of regulatory pressure for P management plans for farms impinging on surface water resources. Lower P rates could also result in cost savings to growers (economic benefit). Building on previous research at the Cranberry Station, this study will focus on low P rates and methods of P delivery. It will consist of two sets of field plots, each treated for four consecutive years. In the first set of plots, a series of P rates from 0 to 30 lb/A actual P will be compared while holding N and K constant (25 and 30 lb/A, respectively). In the second set, N:P ratios will be compared and granular vs. foliar P applications will be studied to see if low P rates are more effective if the element is supplied directly to the foliage. Yield and upright production will be evaluated.

Impact: At the end of this study, it is expected that recommendations will be made for P rates in cranberry production that will support high yields and that will allow growers to be in compliance with standards set forth in the Clean Water Act as interpreted by EPA in the TMDL (total maximum daily load) program.

Basic Biology Projects

Continuation of upright dieback epidemiological studies. (F.L. Caruso and N. Catlin). Project Timeline: 1999-2003. *Funding for graduate student provided by USDA Special Grant and Hatch funds.*

Several objectives have been identified for this project: conduct a survey of beds affected with URD and isolate the fungus from affected uprights; assess the impact of URD on the productivity of cranberry vines; attempt to induce the sporulation of the sexual stage (*Diaporthe*) of *Phomopsis*; and provide proof of pathogenicity (Koch's Postulates). Transects on affected beds will be conducted as in 1999-2000. Studies will be continued for several years as part of a doctoral research project.

Identifying the causal agent of fairy ring disease. (F.L. Caruso and P.V. Oudemans, Rutgers University). Project Timeline: 2001-2003. *IPM funding would partially support this project.*

Initial studies will be conducted in cooperation with scientists from Rutgers University to identify the causal organism of fairy ring. Plans are to provide proof of pathogenicity (Koch's Postulates).

Grower Service Projects

Determination of seed viability to facilitate non-chemical weed management options. Project Timeline: 2001-2004. (H.A. Sandler). *IPM funding would support this project.*

Growers seeking to use non-chemical options, such as mowing, to control weeds have queried as to the best timing to implement these options. This strategy would be especially useful to growers with infestations of prolific seed producers, such as nut sedge (*Cyperus dentatus*). This study will provide information on the best timing to mow nut sedge populations.

Effective dilution rates of RoundUp Ultra for various plant species. (H.A. Sandler). Project Timeline: 2001-2004. *IPM funding would support this project.*

Growers experience varying control of weeds with RoundUp Ultra. Studies would be initiated to determine if more dilute rates of RoundUp would improve efficacy on certain weed species, such as poison ivy (*Toxicodendron radicans*) and silverleaf sawbrier (*Smilax glauca*). Field tests would be performed on growers' farms.

Use of raptor-friendly devices to enhance wildlife around cranberry farms. (J. Mason). Project Timeline: 2002-2004. *IPM funding would partially support this project.*

This project will work to identify utility poles owned by cranberry growers that present mortality or injury hazards to raptors that nest in the cranberry ecosystem. Since the cranberry farm habitat provides open space for which raptors live and reproduce, this project will help to sustain their populations in Southeastern MA.

Phytotoxicity evaluations for post-harvest RoundUp sprays. (H.A. Sandler). Project Timeline: 2002-2004. *IPM funding would support this project.*

A new supplemental label permits the use of spray applications for spot-treatment of weed problems on cranberry farms. No information is available for growers on the appropriate timing that should be used to minimize vine injury. Demonstration plots will be established on State Bog to evaluate timing and injury of the cranberry plant with post-harvest spray applications.

Effect of funky flower on cranberry vines. (F.L. Caruso). Ongoing as needed. *IPM funding would support this project.*

Studies will continue to verify the causal agent of funky flowers and to determine if the causal agent might be seed-transmissible. Field observations of this new disease will continue.

PROPOSED OUTREACH ACTIVITIES

Information Delivery

IPM funding would support all activities listed below that involve the Cranberry Specialist.

MEETINGS AND WORKSHOPS. (Cranberry Station staff). Several informative meetings and workshops will be scheduled for the next fiscal year. Plans include combining the cranberry school (focus on advanced IPM and cranberry production techniques) with our meeting for presentation of research results for one day in January. A health and pesticide application safety workshop is planned for April. We will again hold 2-3 bogside workshops during the summer months.

UPDATE OF CRANBERRY CHART BOOK. (Cranberry Station staff). All sections of the Cranberry Chart Book/Management Guide will be updated in the winter of 2002 to reflect current IPM information and techniques for all disciplines. This management guide represents the most relevant management strategies needed to conduct IPM on commercial cranberry farms.

STATION NEWSLETTER. (D. Cannon and H.A. Sandler). The Cranberry IPM Project Leader will continue to provide pest profiles and technique highlights for the Station Newsletter. The newsletter will be offered free to Massachusetts growers and those involved in IPM nationwide. Industry personnel and out-of-state growers will be charged a subscription fee of \$15. We are encouraging e-mail sign-up for any and all subscriptions. Adoption of E-mail delivery would greatly decrease our needs for printing and mailing of the newsletter. For example of the newsletter, see Appendix B-1.

CONTINUED OUTREACH WITH CRANBERRY STATION WEB PAGE. (H.A. Sandler). Plans are to continue the support of the Cranberry Station Web Page. The Cranberry Station Newsletter, fact sheets, meeting announcements, and other information about Station personnel and activities will be listed on the Web Page. Monies are requested to work with the UMass Web Manager to unify the appearance of the Cranberry Team's Web Page with other commodity teams within the Agroecology Program.

RE-INSTITUTION OF THE IPM PHONE MESSAGE. (H.A. Sandler). Due to several grower calls lamenting the absence of the IPM Phone Message, the IPM phone messages will be available in FY02 through the Station's phone system and on the Web Page. It is anticipated that the message will be available from mid-May through early August.

NEW BMPs and FACT SHEETS. (Cranberry Station staff). Plans are to produce an updated weed management BMP and other fact sheets on key pests as needed.

Other Extension Projects and Activities Proposed

ON-FARM CRANBERRY GROWER EDUCATION. (H.A. Sandler). To further facilitate the implementation of new IPM strategies to the grower community, the members of the Cranberry IPM Project will visit growers' farms during the growing season to assess their implementation of IPM on a one-on-one basis. Personalized instruction on relevant IPM techniques will be given and implementation of appropriate management strategies will be discussed.

ON-FARM GRAPE GROWER ASSISTANCE. (Cranberry Station staff). To further our service of the grower community in Southeastern Massachusetts (and in cooperation with the Small Fruits IPM Program Leader, S. Schloeman), the Cranberry Station staff will be available to answer grape growers' questions periodically during the growing season and assist the growers with disease, insect, and weed management decisions. F.L. Caruso will assist in disease diagnosis.

SCOUTING PROGRAM. (H.A. Sandler). Plans are to scout approximately 12 acres (all state-owned lands in E. Wareham). This acreage, in addition to the communication of other scouts in the industry, will provide sufficient input to grasp pertinent problems and concerns of the industry. No fees will be assessed, as we will be scouting University acreage.

SECTION 18 COMMITTEE CHAIRPERSON. The Project Leader will continue to coordinate all Section 18 activity and requests for the Cranberry Experiment Station. The chair will serve as a liaison between the Department of Food and Agriculture, Cranberry Station Staff, and the grower community. Section 18s under consideration for FY2002 include: pronamide, clopyralid, and spinosad.

BUDGET REQUEST - FY02

SALARIES. Based on negotiations and adjustments by the union, the salary of the Cranberry IPM Specialist (as an Extension Educator) will increase by a 3% COLA through July 1, 2002 (retroactive to July 1, 2001). As of July 1, 2002, the union has negotiated another 3% COLA. Potential merit increases are estimated as 2% of the average bargaining unit salary (~\$45,000). Fringe benefits assessments for this fiscal year are 22% (7% lower than last year). One part-time annual research assistant is requested to carry out many of the IPM research and outreach projects detailed above. A full-time annual research assistant is still needed to enable the Project Leader to conduct a comprehensive research and extension program. It remains a long-term request of the IPM program to obtain personnel in a full-time position with benefits to carry out these duties. The combined salary request for the Cranberry IPM Specialist and one part-time annual Research Assistant is \$78,921.

As in the past, a request has been made for one full-time summer assistant in plant pathology. In addition, monies are requested for one full-time summer in entomology and one half-time summer assistant for nutrition/weed management. Summer assistants are necessary to carry out routine procedures of IPM-related research projects. The combined summer assistant requests total \$13,105 for this fiscal year. To obtain data needed to further the research objectives proposed by the Project Team, additional labor is needed for a multitude of tasks during the growing season. All of these activities are focused on projects that are developing or implementing varied aspects of cranberry IPM. In many cases, different disciplines share summer staffing to perform tasks that require many personnel for short periods of time.

TRAVEL. It is important to keep current on new research and thought in one or more disciplines; thus, monies are requested for the Project Leader to travel to at least one national level scientific meeting. In-state monies are also requested, as sometimes it is necessary for the Project Leader or Research Assistant to use their private vehicles to visit research sites or attend in-state meetings or meetings within the Northeast region.

SUPPLIES. Monies are needed to cover the costs of conducting the daily business of the IPM program that are not covered by other external sources. Greenhouse experiments are planned for the upcoming fiscal year and a request is made for greenhouse supplies. Monies are requested to purchase field and lab supplies for the IPM lab. A request is also made for supplies to support the phytopathological research component.

PROFESSIONAL AND EXTENSION ACTIVITIES. In an effort to reduce costs, we opted to publish the Cranberry Station newsletter in-house. This represents a savings of approximately \$180 per newsletter (we typically print 8-10 newsletters per year). We still are responsible for mailing costs however, and are asking for monies to help defray mailing the newsletter. To further reduce costs, we are asking subscribers to switch receipt of their newsletter to e-mail instead of regular mail. We will encourage change-over to this type of subscription through future mailings and meetings.

The portion of station phone bills related to the IPM Program could be estimated to be between 20-40% of the total bill (IPM Specialist and Team Members) for the Cranberry Station. Monthly phone costs at the Station exceed \$700, not including FAX and e-mail access charges. Request for monies is to cover less than 20% of the annual phone costs (approximately \$8,500 per annum).

A request of \$1,500 matching funds is also made to facilitate revision of the Cranberry Web Page to conform to the standard as proposed by the Agroecology Program. T. Bunnell, UMass Extension Web

Manager, would provide these services for the Cranberry IPM Program. The total cost of performing these revisions is \$3,000.

Monies are also requested to support publication of the IPM Report and Proposal. The IPM program typically produces 55 copies of the report (30 for the IPM Steering committee, 20 for the Cranberry IPM Advisory committee, plus 1 for Cranberry Station library and 4 extra copies). This publication service is provided by an outside copying company.

SUBCONTRACTS. As discussed in a previous Cranberry IPM Advisory Committee meeting, funds would be provided for a consultant to provide scouting information that would be incorporated into the IPM components of the Station newsletter articles. A consultant contract is attached.

IPM FLEET VEHICLE NEEDS. The Cranberry Program requests two vehicles (one truck and one sedan) to meet the needs of conducting IPM-related research in southeastern Massachusetts. Access to vehicles is needed on a 12-month basis during the typical work week. A reliable sedan vehicle is also needed to allow participation of the Program Leader and other cranberry team members in relevant University activities conducted in Amherst. The cost of renting these two vehicles would be (at minimum as per contract prices) \$1,000 per month for a 2-wheel drive truck and \$800 per month for a sedan. These costs may be omitted if fleet vehicles are provided (omission assumed in budget request). The present truck used by the IPM program is over 12 years old. A new vehicle request will be probably be included in future budget requests.

EQUIPMENT REPAIR AND MAINTENANCE. A request for monies to provide repair and maintenance to agricultural equipment is also included.

CRANBERRY IPM PROGRAM BUDGET REQUEST FY 2002

Salaries:

Current Base Salary for Cranberry IPM Specialist per annum (\$912.50 per wk)		\$47,450
Benefits @ 22.0%		\$10,439
FICA (1.45%)		\$688
UE, UH, and WC. (0.93%)		\$441
H&W (52 weeks @ \$9/wk)		\$468
Union Contract increases retroactive from July 2001 and present fiscal year		
2.0% (individual salary) COLA for ~13 weeks @ ~\$18.25/wk	<i>Estimate</i>	\$237
1.0% COLA for ~13 weeks @ ~\$8.65/wk		
(based on unit member average salary of \$45,000):	<i>Estimate</i>	\$112
+ 52 weeks at the same rate (present fiscal year)	<i>Estimate</i>	\$1,400
Benefits @ 22% of increase (\$26.90/wk)		\$308
FICA (1.45% of increase)		\$20
UE, UH, and WC (0.93% of increase)		\$13
Union Contract salary and merit increase July 2002 (~13-week period):		
3.0% COLA (from new individual salary estimate of \$939.40/wk)		
for ~13 weeks @ ~\$28.18/wk	<i>Estimate</i>	\$366
+2.0% merit for ~13 weeks @ ~\$17.31/wk		
(based on unit member average salary of \$45,000):	<i>Estimate</i>	\$225
Benefits @ 22% of increase (\$45.49/wk)		\$130
FICA (1.45% of increase)		\$9
UE, UH, and WC (0.93% of increase)		\$5
One part-time, nonbenefitted, annual employee for IPM Program		
(Joanne Mason: 24 hr/wk; \$13/hr for 52 weeks)		\$16,224
H & W (1.45%)		\$235
UE, UH, and WC (0.93%)		\$151
Full-time summer hire to assist in development of disease IPM (Caruso)		
(\$8/hr for 16 wk, 40 hr/wk)		\$5,120
H & W (1.45%)		\$74
UE, UH, and WC (0.93%)		\$48
Full-time summer hire to assist in entomology program (Averill)		
(\$8/hr for 16 wk, 40 hr/wk)		\$5,120
H & W (1.45%)		\$74
UE, UH, and WC (0.93%)		\$48
Half-time summer hire to assist in phosphorus project and pH vegetation survey (DeMoranville and Sandler)		
(\$8/hr for 16 wk, 20 hr/wk)		\$2,560
H & W (1.45%)		\$37
UE, UH, and WC (0.93%)		\$24

TOTAL SALARIES

\$92,026

<u>Travel:</u>	
Attendance of one meeting by Extension Educator-Cranberry IPM	\$1,200
In-state travel (800 miles @ \$0.325 mile)	\$350
<u>Office Supplies</u>	\$800
<u>Greenhouse Supplies</u>	\$800
<u>IPM Research Supplies</u>	\$1,000
<u>Plant Pathology Supplies</u>	\$1,000
<u>Professional and Extension Activities:</u>	
Newsletter mailing costs	\$800
Subscriptions to professional organizations (ESA, APS, WSSA)	\$400
Phone, FAX, and e-mail costs from remote campus	\$1,500
Matching funds for Web Page revision	\$1,500
Publication of IPM report and proposal	\$500
<u>Subcontracts:</u> Consultant to provide information for IPM program	\$500
<u>Vehicles</u>	
Fuel	\$800
<u>Equipment Repair and Maintenance</u>	\$600
TOTAL SUPPLIES, etc.	\$11,750
TOTAL ANNUAL SALARIES	\$78,921
TOTAL SEASONAL SALARIES	\$13,105
TOTAL SUPPLIES	\$11,750
TOTAL REQUESTED (w/o vehicle rental)	\$103,776