RUTGERS COOPERATIVE EXTENSION
NEW JERSEY AGRICULTURAL EXPERIMENT STATION

The BLUEBERRY BULLETIN

A Weekly Update to Growers
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October 23, 2003 **Vol. XIX, No. 22**

This is the last newsletter for the 2003 growing season. My staff and I wish you all a great holiday season and have a good and safe winter. Look for the Blueberry Open House program and Blueberry Bulletin update early February 2004.

AT A GLANCE…

Problem - Solution

pH – Check now and adjust

Weeds – ID weeds
where control was inadequate

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BLUEBERRIES:

Disease and Culture:
Dr. Gary C. Pavlis, County Agricultural Agent, Rutgers University

Pruning Blueberries: New Jersey has approximately eight thousand acres of blueberries under cultivation and this is the primary crop for which I have extension responsibilities. Pruning continues to be little understood and poorly executed throughout the industry. In fact, it is rare to find two growers who prune the same. I would like to clear up a few misconceptions and try to outline a simple method of pruning blueberries.

The first place to start would be to discuss the importance of pruning. Growers often feel that pruning is of little value because the effects of the practice are not immediately apparent or dramatic. It should be noted that a well known blueberry researcher, Phil Marucci stated many years ago that there were a few factors which have greatly influenced the lack of increase in blueberry yield on a per acre basis over the last 30 years and pruning was the most significant factor.

More recent research has revealed that young canes are more efficient fruit producers than old canes. In fact, canes, which are 3 to 10 years old, allocate greater than 50% of applied water and fertilizer to fruit production. By the time a cane reaches 20 years of age, only 25% are allocated to fruit. (Water and fertilizer costs

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the grower money and there is no profit in the production of blueberry leaves.) Additional research compared three pruning types on yield and fruit size. Plants were 1) regularly pruned in a moderate manner such that one out of every six canes per cut out, 2) heavily pruned by removing 40% of all canes out every five years and 3) not pruned at all. The result was that the regular moderate pruning had the highest yield on the least number of canes. Research has also shown that as pruning increases, new cane production increases. These studies show us that young canes out produce old canes, the removal of one out of six canes produces the right number of new canes and the highest yield and fruit weight is produced with regular moderate pruning.

It is also important to understand how a blueberry plant grows. Each year, canes are initiated from the base of the plant. Each succeeding year, the cane produces laterals, laterals produce laterals and so on. Each year the lateral production on any individual cane decreases in diameter, or put in other words, the wood becomes progressively twiggy. It should be realized that as wood becomes smaller, fruit size decreases. This is why we detail prune to increase fruit size.

With this information under our belts we can address how to prune. There are really 5 basic steps to keep in mind when approaching a bush, which is to be pruned. 1.) Assess the plants overall vigor, is cane production adequate? 2.) Prune out all dead wood. 3.) Locate the oldest canes and prune out one of every six canes thus if the plant has twelve canes, remove two of the oldest. 4.) Prune out all low branches, which will never be picked and are a source for disease. 5.) Detail prune, i.e. remove as much twiggy wood as time allows.

Armed with these basics, we can now deal with the different plant situations that arise. First, pruning young plantings has primarily the objective of establishing the plant to obtain full production as soon as possible. Thus, the first two years the procedure is to remove flower buds. Some growers cut off as much as the top half of the plant. This is really quite drastic. Rubbing off lower buds would be sufficient however in a big operation it is usually less labor intensive to cut the top 3-5 inches off each cane which will remove most flower buds. Any weak twiggy growth should also be removed.

In year three, a small crop is possible but not the expense of stunting the plant. Usually 1-2 pints/bush is the optimum and fruit should only be on strong wood.

The fourth and fifth year twiggy growth must again be removed as well as any lateral canes, which have developed. Fruit production can be increased but the amount is dependent on the number of new canes which were produced the preceding years, 3-5 canes/yr. is optimum.

The blueberry planting should be in full production by the sixth year though there are numerous variables, which will influence this timing. The most important of these being proper pH and nutrition, water management and the crop to cane production balance.

I have found it is also helpful to growers to discuss blueberry pruning strategies based on plant status. I do not believe there is a strategy for each variety though any one variety may fall into one of the following categories most of the time. For example, the variety Blueray often has a spreading or open habit in which canes tend to bend down to the ground. Plants of this type must be thinned to the 1 of 6 rule however canes that are bent over also tend to produce an upright shoot. These canes should be pruned just above this upright shoot to produce a more erect plant. Other varieties that often fit into this category are Berkeley, Bluetta, Coville, Weymouth and Patriot.

Varieties such as Bluecrop, Collins, Darrow, Earliblue, Herbert, Jersey, Lateblue and Elliot often fall into the erect plant category. These plants become overly dense in the center which decease's fruit bud initiation. The pruning strategy for this category is to remove older central canes before all others.

When plants are overly vigorous, the primary strategy is to remove entire canes rather than spend time on detail pruning. This is done at least until the proper fruit to cane production balance can be established through nutrition and fruit production management. Varieties that are prone to this situation are Earliblue, Collins, Blueray, Herbert and Collins though any variety can potentially be overly vigorous.

Weak plants are treated in the opposite manner. The primary procedure is to detail prune rather than whole cane elimination. Varieties that are classically put into this category are Weymouth and Bluetta.

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I should take a moment to address the method of pruning on a field that has been neglected for a long time and needs to be rejuvenated. This question often comes up when a grower has purchased one of these fields.

The most important step is to inspect the plants in their field for virus symptoms. Any plant showing these symptoms should be pulled out. The plant inspections must be done during the growing season because symptoms are most easily seen on the leaves. The next step is to completely prune everything down to the ground, a chain saw is the quickest and easiest method. This pruning is best done in late winter. An application of a 10-10-10 fertilizer should be made in early April, usually at a rate of 400 lbs. per acre. No crop will be harvested that year however the following winter the canes should be thinned to approximately 12-16 canes per plant. A full crop can be harvested that year.

In summary, pruning correctly can 1) increase yield, by producing more young canes, 2) increase fruit size by producing more strong wood, 3) decrease disease by removing dead wood and, 4) increase cane initiation because as pruning increases, cane number increases. Pruning costs money, but it will cost a grower more if it isn't done and it isn't done correctly.

Sincerely,

Dr. Gary C. Pavlis
County Agricultural Agent, RU
Editor - Blueberry Bulletin *ma* ❐

Visit our Web-Page
INTERNET ADDRESS
Click on to the RCE Web site
and see our 'Web Page'.
www.rce.rutgers.edu/pubs/blueberrybulletin

ORGANIC HIGHBUSH BLUEBERRY PRODUCTION

Bill Sciarappa, Ph.D., Gary Pavlis, Ph.D., Nicholi Vorsa, Ph.D.

Four significant developments have occurred that amplify opportunity for certified organic growers to successfully grow organic highbush blueberry and to increase or transition acreage. First, there is the recent USDA national organic standardization that defines organic production practices and crop labels that creates clarity and evens competition. Second, we have the continued increase of smallfruit and vegetable sales related to nutritional and human health reasons that strongly contribute in creating today's $40,000,000 highbush blueberry market in NJ. Future agribusiness gains are promising through the "organic certification" market segment. This organic designation appeals to today's consumer as an even higher market value and creates a separate market segment above the fresh market mainstream. Third, new tools are becoming available to organic growers that reduce the risk from pest problems such as the recent organic registration of Spinosad – now known as Entrust in the organic market. Finally, the Rutgers Blueberry Research Working group has made considerable progress in refining standard IPM practices and in helping develop new tools and holistic approaches for organic production systems. Our "Work in Progress" is establishing alternative approaches to some current agricultural practices in soil building, fertility, cultural approaches and pest management.

When blueberries were first selected and cultivated in the early 1900's, the traditional culture of this native small fruit was essentially organic in nature. Currently, perhaps 2/3's of what "conventional" growers do horticulturally is directly applicable to organic production. Some examples include selection for resistant varieties, pruning for canopy ventilation to reduce disease incidence, adding organic amendments in building soil such as peat and humus, mulching for weed control and water conservation, raised mounds, rogueing of infected plants and the use of natural plant protection products like Bt, Pyrethrum and Spinosad which are safe to natural enemies.

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In contrast to other fruits that have been introduced from other countries, the blueberry is one of the few native American fruits that has relatively good natural resistance to diseases and insects as well as an inherent vigor because it has been domesticated for less than 100 years. Thus, there is this strong historic baseline for succeeding in the return to organic production although some key risk factors remain to be solved. To achieve this comprehensive vision of an integrated organic production system, specific obstacles are being addressed by a team of collaborating specialists supported by RCE administrators Dr. Nick Vorsa of the Phil Marucci Blueberry and Cranberry Research Center and Jack Rabin of the NJ Agricultural Experiment Station as follows:

Variety Selection – Dr. Mark Ehlenfeldt comparative work for the USDA breeding program suggests using early maturing varieties to escape later season blueberry maggot attack like Weymouth, Bluetta and Earlyblue. Mark continues research with new and better varieties resistant to pathogens that are essential in initiating any organic enterprise.

Fertility – Dr. Gary Pavlis has demonstrated the importance of pH in maximizing plant health through the enhanced availability and uptake of nutrients as the ammonium nitrogen form. Gary has also demonstrated the water conservation benefits of trickle irrigation. Dr. Joe Heckman points to a listing of organic based fertilizers to include nitrogen, phosphorus and potassium sources such as rock phosphate, greensand, bone meal, fish meal and composted manures to restore depleted soils. Check out recent and previous editions of the Rutgers Extension newsletter - Blueberry Bulletin.

Mulching – Dr. Barbara Rogers is researching the impacts of organically approved mulches for soil benefits and weed control. Barbara's investigations with Dr. Uta Krogmann include the recycling of composted cranberry fruit and leaves, municipal leaf blends with available manures, wood chips and plastic mulch.

IPM Scouting – Our state fruit IPM specialist Dean Polk has provided timely pest population data that is GIS positioned within a blueberry field to allow spot spraying as needed based upon economic thresholds. Dean's extensive scouting program utilizes direct pest assessment, pheromone trapping systems and colored sticky boards for decision making.

Entomological Research – Dr. Sridhar Polavarapu has emphasized pruning of old cane to reduce scale infestation, clean cultivation to suppress cranberry weevil and plum curculio and using OMRI approved insecticides as *Bacillus thuringiensis* (Bt), azadirachtin (neem plant extract), rotenone, pyrethrum and spinosad. Spinosad should handle the difficult to control aphid complex and other economically important insect pests. Sridhar's research on baited toxicant sphere attractant traps for blueberry maggot and pheromone trapping approaches for oriental beetle are quite promising for commercialization.

Phytopathology Research – Dr. Peter Oudemans has stressed the importance of sanitation in the field to minimize pathogen entry and spread, use of certified free nursery stock, rogueing of virally diseased plants, pruning of bacterial or fungal infected stems and the promotion of rapid drying of leaf and fruit surfaces. OMRI certified fungicides as oxidate are part of his efficacy evaluation program as have been the natural minerals sulfur, lime and copper and bordeau mixture, kaolin clay and urea. Mechanical cultivation and new biological controls appear promising for Mummyberry suppression in the soil.

Weed Control – Dr. Brad Majek provides weed species identification and essential information as to the life cycle of these annual, biennial or perennial grass and broadleaf weeds. Brad's advice helps plan for a weed control program which includes trying various mulching practices and treatments.

Commercial Organic Grower – John Marchese, Emery's Berry Farm. John's progressive approaches to planting, weed control and fertility from an organic underpinning have been extremely helpful in establishing commercial utility. His comparative use of the Weed Badger rotary hoe, flaming, cover cropping, mulching and alleyway establishment and other methods are pointing out some ways for economically solving problems specific to large-scale organic production.

Commercial Conventional Grower – Bobby Galletta, Atlantic Blueberry. Bobby and his family continue to share their legendary experiences and extensive knowledge in blueberry production in efforts to expand the industry and maintain profitability.

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Certification & OMRI Information – Karen Anderson - Erich Bremer – NOFA-NJ. The Northeast Organic Farming Association of NJ has been actively involved in certifying acreage for organic production and in explaining to growers the approved practices and materials that are essential to maintaining compliance. Through NOFA, growers can connect with other growers as to successful farming practices and can gather current information on plant protection materials and fertilizers through OMRI: Organic Materials Resource Inventory. Call 609-737-6848.

Final Comments –Currently, about 7,500 acres of blueberries are grown in NJ with less than 2% (approximately 110 acres) produced organically. The authors believe that the agribusiness situation is that of an advanced market ahead of agricultural research; demand ahead of supply. The price of a flat of organic blueberries has ranged from $18 to $28 over the last three years while conventional production prices have generally ranged between $8 to $14 per flat. Any growers interested in transitioning to organic blueberries may feel free to contact the author for advice and connection to the team of leading experts referred to in this article. 732-431-7260 or e-mail sciarappa@aesop.rutgers.edu.

PERENNIAL FRUITS INSURANCE DEADLINE JUST AROUND THE CORNER

Contact: Warren Hawkins, 919-875-4880

The final date to obtain crop insurance on apples, blueberries, cranberries, and peaches in New Jersey is November 20, 2003. Current policyholders likewise have until November 20 to make any changes to their existing contracts. Apple producers can select from various quality options and rice elections up to $7.10 per bushel. Peach growers may similarly insure their crop based on their average yield and a price election of $16.00 per bushel. Highbush blueberries are insurable at $.56 per pound while cranberries are insurable at $28 per barrel. Crop insurance provides effective protection against losses due to natural perils and adverse weather, such as hail, hurricanes, and drought. Growers are encouraged to contact a local crop insurance agent as soon as possible for more detailed information and premium quotes. For a list of crop insurance agents in your area, contact the local USDA Farm Service Agency office or log on to the following Risk Management Agency web site:
http://www3.rma.usda.gov/tools/agents/
September 24, 2003

NEW JERSEY INFORMATION NETWORK FOR PESTICIDES & ALTERNATIVE STRATEGIES

Patricia D. Hastings, Program Associate, Rutgers Cooperative Extension Pest Management Office

The New Jersey Information Network for Pesticides & Alternative Strategies (NJinPAS) is part of a grant-funded network designed to provide a structure to gather and transmit information on issues relevant to both current and transitional pest management strategies. Dr. George Hamilton, Specialist in Pest Management is the Coordinator of this program.

One of the key elements of this program is expedited delivery to New Jersey stakeholders of more timely pesticide-related information (such as regulation advisories, requests for comment, voluntary pesticide cancellations, pesticide security alerts, NJDEP WPS enforcement initiatives). So, NJinPAS set up and maintains nine listservs for growers, crop consultants, pesticide users, public interest groups, environmental groups, and Extension faculty and staff. There is a Network listserv for more general postings, plus 8 additional listserv subgroups for more specific distribution, including regulation notices or pesticide advisories. It is set up so that if you are on more than one listserv, you will not receive multiple postings. The information provided typically augments rather than duplicates the information you receive in the Plant & Pest Advisory, and it is maintained throughout the year.

The nine separate listserv categories for open enrollment are:

- Network;
- Institutions & Interiors;
- Mosquito;

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- Fruit;
- Turf, Ornamentals, Greenhouse, & Nursery;
- Field & Forage Crops;
- Vegetables;
- School IPM; and
- Forests & Christmas Trees.

Contact Pat Hastings at 732-932-9801 if you would like to enroll. Or, you can enroll online at: http://pestmanagement.rutgers.edu/NJinPAS/listservpostings.asp. You may choose to view postings by date, title, listserv posted, or by topic. Better yet, you can do a work search of the titles and topics. So for example, you can look for a specific pesticide, crop, or agency. Reprinted from the Fruit Pest & Plant Advisory newsletter.

FOCUS ON FARM SECURITY

60th Annual Farm Safety and Health Week: September 21-27

Itasca, IL - The 60th Annual National Farm Safety and Health Week will be observed on September 21-27, 2003. This year's theme, "Secure Your Farming Future through Safety and Health", focuses on the importance of protecting the lives and livelihood of farmers and ranchers and securing the safety of the nation's food and water resources.

National Farm Safety & Health Week is an annual observance of the National Safety Council (NSC) to commemorate the hard work and sacrifices of our nation's farmers and ranchers. During this year's recognition, the NSC will work with its agricultural members and its partner in agricultural safety and health, the National Education Center for Agricultural Safety, to provide fact sheets and other information, education and training on farm safety, health and security issues.

"Farm Safety & Health Week is a time for all of us to thank the nation's farmers and ranchers for their important contributions in providing food for our world," said NSC President Alan McMillan. "It is also a time for farmers and ranchers to focus on important safety and health issues, including the safety of children and young adults that perform farming duties, safe use of tractors and equipment and safe use of guards and retrofits on farm machinery."

"This year, we have an additional, important focus on farm security issues," McMillan said. "Farmers have an important role in securing the safety of the nation's food supplies, water resources, and farm chemicals."

Agriculture had the second-highest rate of deaths due to unintentional injuries of any industry in 2002, with a rate of 21 deaths per 100,000 workers. (The overall occupational injury death rate for all industries in 2002 was 3.6 deaths per 100,000 workers.) More than 3.4 million people worked in the agriculture industry, and 730 died from work-related injuries, in 2002. Another 150,000 people suffered disabling injuries in 2002.

For more information about National Farm Safety and Health Week, please visit the NSC website at http://www.nsc.org/farmsafe.htm for details.

The National Safety Council, America's safety and health leader for 90 years, is a nongovernmental public service organization with 50 local chapters around the country and members representing 45,000 business and labor organizations, schools, public agencies and private groups.

National Safety Council
A Membership Organization Dedicated to Protecting Life and Promoting Health
1121 Spring Lake Drive, Itasca, IL 60143-3201
Tel: (630) 285-1121;
Fax: (630) 285-1315, August 22, 2003

5th ANNUAL FUTURE OF OUR FOOD AND FARMS SUMMIT

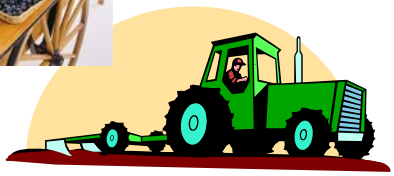
Our Future Grows Here

Date: December 4 & 5, 2003
Town: Wilmington, Delaware
Hotel: Wyndham Hotel (302-655-0400)

$20 EARLY REGISTRATION DISCOUNT
Deadline Is November 3

New! Minority Farming Training
Scholarships available
New! Youth Voices in Agriculture Workshop
Scholarships available!
Plus –
Direct Marketing Training for Farm Profitability
3rd Annual Hunger Congress
Nutrition Education Symposium
Special Guests:
Senator Tom Carper, United States Senate
Governor Ruth Ann Minner, Delaware
Carol Tucker Foreman, Consumer Federation of America, Food Policy Institute
Michael Rozyne, Red Tomato
Eric Bost, USDA Food, Nutrition& Consumer Services
Gary Grant, Black Farmers and Agricultural Association
Hosted by:
Mid-Atlantic Food & Farm Coalition
Sponsored in part by:
Northeast SARE
Pennsylvania Nutrition Education Plan
USDA CSREES

If you are interested in more information call 609-625-0056 and ask for a copy of The Future of Our Food & Farms program we will be glad to mail you one OR you can go on line at www.foodfarm.org.



DECONTAMINATING AND STORING SPRAYERS

Dr Andrew Landers, Cornell University

Sprayer decontamination and maintenance

Sprayers must be thoroughly decontaminated, inside and outside, after use. Regular maintenance of spraying equipment will prolong its life and ensure accurate trouble-free operation, enabling spraying to be done with the minimum loss of time and taking full advantage of favorable weather conditions.

NOTE: Read the sprayer manufacturer's instructions before beginning to wash out a sprayer. Wear protective clothing appropriate to the pesticide which has been used; this may include an apron, rubber gloves, boots and face shield.

It is important to clean everything thoroughly, including associated equipment such as mixers, the site where filling and mixing is done, and, of course, yourself.

Disposal of pesticide waste

REMEMBER cleaning up should be done in such a way that washings DO NOT enter public sewers or any water courses, nor fields which have under-drainage and certainly not catchment areas for boreholes or wells.

The safe disposal of pesticide waste is a serious responsibility for sprayer operators. It is important, therefore, that everything should be done to keep to a minimum the amount of waste generated. Remember pesticide waste is of four types: Concentrated products, diluted pesticides, including washings, empty containers and contaminated clothing and other materials.

Try to keep the volume of tank washings produced to a minimum. Special low volume, inexpensive washing systems are now available which comprise spinning nozzle(s), mounted in the tank. The device can be connected to a hose or water tank and water, after it has passed through the rotating nozzle(s) cascades down the inside of the tank walls.

Preparation for storage

Sprayer decontamination is as follows:

1. Any spray liquid or contamination left in the tank should be disposed of correctly.
2. Remove tank drain plugs or open drain cock.
3. Hose down inside the tank and outside, including the tank top, scrub where necessary or use a special low volume washing system.

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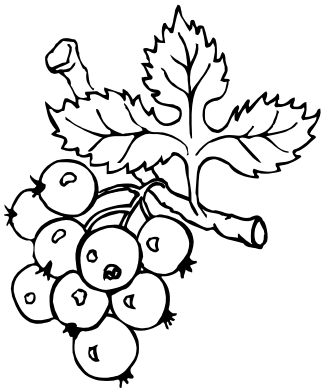
4. Replace drain plug.
5. Remove suction, main and in-line filter elements; wash them thoroughly in clean water with a soft brush and replace.
6. Remove nozzles, nozzle filters and nozzle manifold end-caps if they are fitted. Soak them all in a bucket of water with appropriate cleaning agent recommended for the cleaning of spray machinery. Scrub clean with a soft brush.
7. Partly fill the tank and pump out to flush all parts. Ensure you open/close valves during the flushing procedure to clean out crevices. Do this more than once if necessary.
8. Refill the tank with clean water or a recommended cleaning agent, there are about a dozen commercial tank cleaners designed to remove or neutralize most of the modern low rate chemicals. If no cleaning agent is recommended, one gallon of household ammonia per 50 gallons of water may be used. Do not use chlorine-based cleaners such as Clorox. Recirculate for 15 minutes, then pump a quantity through the pipes and spray bars. Leave the remainder for as long as practicable, overnight if possible.
9. Discharge at least one quarter of the contents of the tank through the system and spray bars. Drain off the rest.
10. Check that no deposits remain in the tank or filters. If there are any, they should be hosed down and scrubbed off.
11. Repeat steps 8 to 10 using clean water with the appropriate cleaning agent.
12. Safely store nozzles and filters, leave valves open and the tank lid loosely closed. Ensure that the sprayer is completely empty of water, particularly the pump. If you are unable to completely drain the system, you may consider using an antifreeze solution. An environmentally safe anti-freeze diluted to 50% may be acceptable, alternatively, RV antifreeze may be used but remember it can't be diluted and so make sure the system is drained of water. Currently RV antifreeze costs $2.00 – 2.50/gallon from stores such as Wall Mart etc.
13. Hose down the outside of the sprayer, scrubbing if necessary.
14. Ensure the sprayer is parked safely and securely
15. Wash down waterproof protective clothing, apron, boots and face shield.
16. Wash inside and outside of gloves with soap and water; rinse and dry them.
17. Finally thoroughly wash hands, face and neck with soap and water.

Mechanical maintenance

Lubrication must be carried out prior to storage, check oil levels in the pump. Check the soundness of all mechanical components. Electrical connectors which operate control valves, spray monitors etc need to be cleaned and a non-conductive grease, available at an auto store, applied to prevent corrosion. Check wheels, wheel bearings and tire inflation.

Storage of sprayers

Store the sprayer under cover, taking care to prevent dirt and moisture affecting the tank or working parts. Remember, sunlight softens and weakens rubber materials and can degrade plastic materials. Storing in a building also allows you the opportunity to conduct any routine or pre-season maintenance.



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