

RUTGERS

New Jersey Agricultural
Experiment Station

The BLUEBERRY BULLETIN

A Weekly Update to Growers

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AT A GLANCE...

This is the last issue for the 2011 season. I wish you all a very safe and happy holiday season.

In the fall it is wise to:

- 1. Assess how well your herbicide program performed and plan adjustments.**
- 2. Take soil samples to determine if pH should be adjusted (fall is best)**
- 3. Apply lime sulfur when 2/3 of the leaves drop to control Phomopsis, cane canker etc.**

CULTURE

Gary C. Pavlis, Ph.D.

County Agricultural Agent

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 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.

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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 decrease'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.

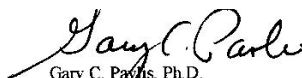
Weak plants are treated in the opposite manner. The primary procedure is to detail prune rather than whole cane elimination. Varieties that are classically put into this category are Weymouth and

Bluetta. 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,



Gary C. Paris, Ph.D.
Atlantic County Agricultural Agent

Editor – Blueberry Bulletin slp

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.

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.

For Immediate Release

Contact: Barbara L. Phillips, PAS
Barbara.phillips@nj.usda.gov or 732-537-6044

Apply by December 30 for Funds to Improve Fish and Wildlife Habitat on Agricultural Land

SOMERSET, NJ August 31, 2011 – New Jersey farmers and farm managers still have time to apply for funding to support projects on their agricultural land that will improve or develop fish and wildlife habitat. State Conservationist Donald J. Pettit has extended the sign up period for the 2011 Wildlife Habitat Incentive Program (WHIP) to December 30, 2011. “Through WHIP, USDA, Natural Resources Conservation Service (NRCS) can provide technical and financial assistance to establish and enhance habitat for priority species and habitat types, which will help keep New Jersey’s environment healthy.” Pettit said.

Priority habitats are grasslands, woodlands, wetlands, disturbance-dependent areas such as the Pine Barrens, pollinator habitats and Bog turtle habitat. The New Jersey priority area is the Delaware Bay which includes Cape May, Cumberland and Salem counties.

To participate in WHIP, applicants must own land capable of being farmed or land suitable for wildlife habitat; or have an interest in an agricultural operation, including forestry, and own or have control of the land under consideration.

Other conservation programs administered by NRCS that are still open for the 2011 funding cycle include the [Grasslands Reserve Program \(GRP\)](#), the [Wetlands Reserve Program \(WRP\)](#), and the [Agricultural Management Assistance Program \(AMA\)](#), and two components of the Environmental Quality Incentives Program (EQIP): [Conservation Activity Plans \(EQIP-CAP\)](#) and the [Forestry Initiative \(EQIP-Forestry\)](#).

To apply, visit [NRCS at your local USDA Service center](#). More information about [NRCS conservation programs](#) is available online at <http://www.nj.nrcs.usda.gov/programs/>.

MADE WITH JERSEY FRESH ITEMS FOR USE IN SCHOOL LUNCH PROGRAM UNVEILED

Farm to School Recipes Developed Through Federal Grant

For Immediate Release: September 30, 2011

Contact: Lynne Richmond
(609) 633-2954

(TRENTON) – On the final day of the first-ever Jersey Fresh Farm to School Week, New Jersey Secretary of Agriculture Douglas H. Fisher and Rutgers Food Innovation Center officials today unveiled several recipes developed through a \$51,000 grant to create new food items derived from New Jersey agricultural products for use in the National School Lunch Program.

Students, as well as officials visiting Gloria M. Sabater Elementary School in Vineland sampled whole grain Jersey blueberry muffins, Jersey eggplant rollatini with Jersey Tomato primavera sauce and Jersey blueberry and cranberry yogurt parfaits.

“More and more schools are participating in our Farm to School program, serving Jersey Fresh produce as part of their school meals program during the growing season,” said Secretary Fisher. “But, these newly developed recipes will enable schools to serve locally grown produce all year long in the form of Made with Jersey Fresh or Jersey Fresh Milk products.”

The Department of Agriculture received the U.S. Department of Agriculture Federal-State MarketingImprovement Program Grant late last year and has worked with the Food Innovation Center to

develop single serving, innovative items that meet the nutritional, cost and shelf life requirements necessary to be utilized in school meals.

The Rutgers Food Innovation Center, a program of the New Jersey Agricultural Experiment Center is a unique food business incubator and processing facility. The center has been commissioned through this grant to research, develop and determine commercialization opportunities in order to bring the concepts to school cafeterias throughout New Jersey.

"We have met with many food service directors across the state to understand their preferences for locally produced products that will work well within their kitchen parameters, meet healthy nutritional guidelines, and deliver on pricing," said Diane Holtaway, associate director of client services at the Food Innovation Center and project director. "A key next step is to run sensory taste tests with students where hopefully we gain a thumbs-up. We will definitely use their comments to finalize the recipes. Our goal is to make the end products a triple win – win for the farmers, win for the students and win for the school food service directors."

The purpose of the grant program is to develop innovative ways to benefit farmers. A significant market opportunity exists if the seasonal availability of New Jersey Agricultural products to the school meals program could be expanded. Annually, more than 800,000 pounds of locally grown fruits and vegetables are distributed to schools under a cooperative agreement with the U.S. Department of Defense. Due to the September through June school year, it would be difficult to expand upon those quantities.

The Department of Agriculture is actively engaged in connecting schools with farmers and local produce distributors to bring more New Jersey produce into the school meals' program. The Department, in cooperation with the New Jersey Farm to School Network celebrated Farm to School Week September 26-30, which takes place the last week in September each year to promote the state's agricultural industry and encourage children and their families to increase their consumption of fresh produce. The week also seeks to educate about the health benefits of eating fruits and vegetables and show the connection between a healthy diet and success in school.

Through the Farm to School program, schools throughout New Jersey can source more than 100 types of Jersey Fresh produce grown here in the Garden State. Opportunities exist for state farmers to provide agricultural products to school food service departments throughout the growing season. The object of serving healthy meals in school cafeterias is to improve student nutrition, provide health and nutrition education opportunities that will last a lifetime, as well as support local farmers.

Additionally, the farm to school program includes school garden activities, which help teach students where food comes from by growing it themselves. Students benefit by learning the science behind farming and the nutritional values of fresh products, as well as gain a greater understanding and appreciation of the environment. Educators can use school garden programs to teach any subject - math, science, language arts, health and nutrition or social studies. Finally, farm to school programs create a sense of community for all involved with the related activities.

"Farm to School Week is our opportunity to reinforce the importance of using fresh, wholesome local produce in school meals, but also to educate students about where their food comes from and how vital it is to have farms in New Jersey," said Secretary Fisher. "We hope more schools will be inspired to partner with farmers to purchase Jersey Fresh fruits and vegetables and start their own school gardens."

The bill creating Farm to School Week was sponsored by Senators Jim Whelan and Steven Oroho and Assemblymen John McKeon and John Burzichelli and Assemblywoman Annette Quijano and then signed by Governor Chris Christie in January.

Other events held to celebrate Jersey Fresh Farm to School Week this year included a school garden tour at Riverside Elementary School in Princeton, an apple tasting at Village Elementary School in West Windsor; a school food service tour of Tri-County Cooperative Auction Market in East Windsor; and a Jersey Fresh cooking contest at P.S. #17 in Jersey City.

For more information, visit www.nj.gov/agriculture/divisions/fn/childadult/farm_to_school.html.

Manage for BOTH Pollinators and Plants

Areas planted to attract pollinators need to be managed to protect both the plants and the pollinators in the area.

To protect the pollinators visiting the habitat you create, you should avoid or minimize the following:

- Tillage
- Insecticides and Some Fungicides
- Plastic Mulch
- Removal of Beneficial Plants



Little-Known Fact: Leaving natural areas protects and attracts native pollinators by providing food and a safe haven away from insecticides.

Assistance for New Jersey Farmers

Contact Jolie Goldenetz Dollar, Pollinator Habitat Restoration Specialist for the Mid-Atlantic Region, at the Cape May Plant Materials Center for help with pollinator conservation and native plant restoration.

Location: 1536 Route 9 North
Cape May Courthouse, NJ 08210
Phone: 609.465.5901, ext. 101
Email: jolie.dollar@nj.usda.gov

Pollinator Habitat Funding

Funding for pollinator habitat is available through the following NRCS programs:

- Conservation Stewardship Program (CSP)
- Environmental Quality Incentives Program (EQIP)
- Wildlife Habitat Incentives Program (WHIP)
- Agriculture Management Assistance (AMA)

Through these programs, you can select any of the following conservation activities to help you attract and protect native pollinators on your farm.

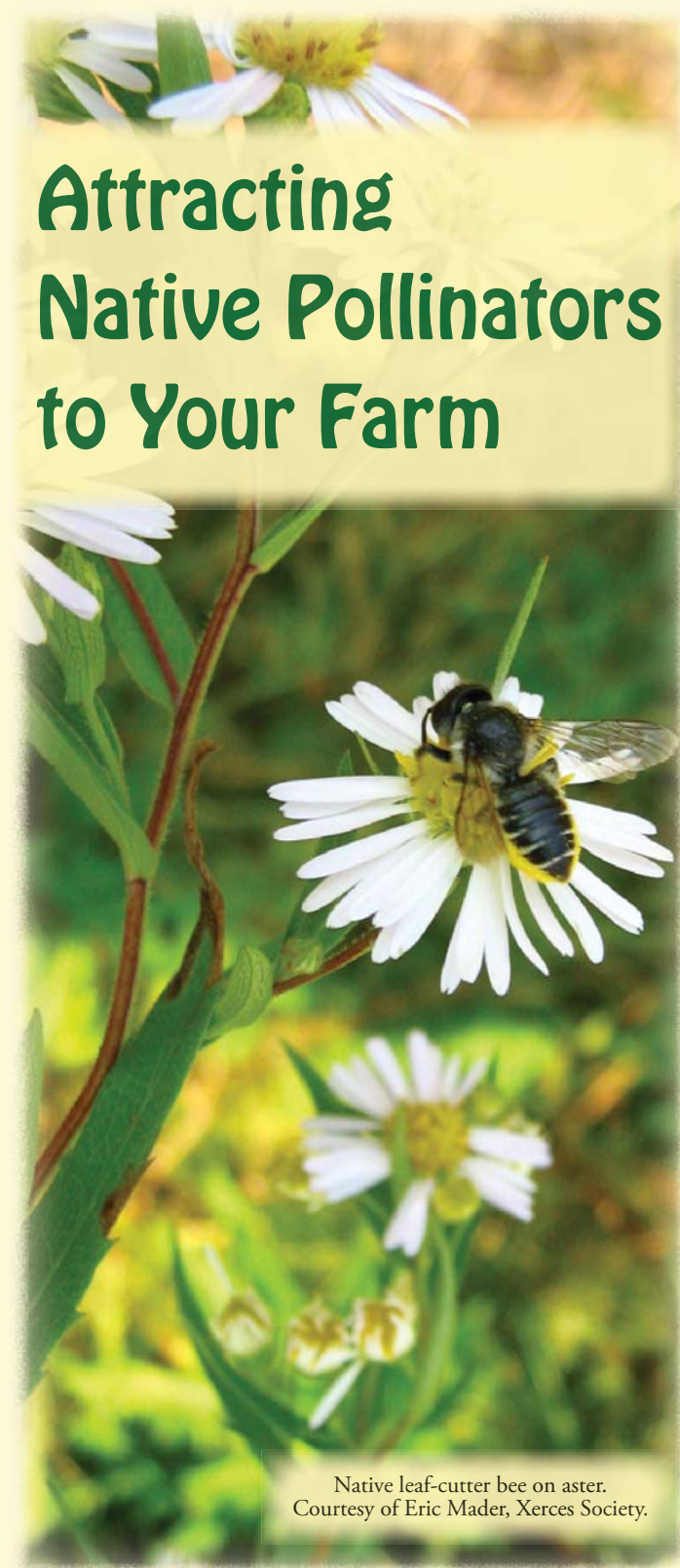
- **Pollinator Plantings** – provide a food source and secure nesting for ground-nesting bees by establishing a variety of flowering plants. Use NRCS practices such as:
 - » **Conservation Cover**
 - » **Field Borders**
 - » **Early Successional Habitat**
 - » **Tree/Shrub Establishment**
- **No Till Planting** – protects ground-nesting pollinators by reducing ground disturbance.
- **Pest Management** – protects pollinators by reducing pesticide applications.
- **Buffer Plantings** - marginal areas around organic farms can include pollinator plantings.



May 2011

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Attracting Native Pollinators to Your Farm



Native leaf-cutter bee on aster.
Courtesy of Eric Mader, Xerces Society.

The Importance of Pollinators

One out of every three mouthfuls of food and drink we consume is available because of pollinators. Although there are many animals that play a role in the pollination of our food, bees are the most important of these pollinators.

Historically, the agriculture industry has used managed hives of European Honey Bees for pollination. With the recent decline of this species due to colony collapse disorder, it is important to diversify the pollinators we use for crop production and supply valuable pollinator habitat. This habitat benefits both native bees and honey bees.



Native Bee Pollinators Can Help!

Whether you are producing fruits, vegetables, or both, it is beneficial to attract and protect native pollinators.

Native bees can provide the following benefits:

- More effective flower pollination than honey bees, on a bee-per-bee basis
- More active during cooler and wetter conditions compared to honey bees
- More abundant and larger fruit production because of buzz pollination
- Increase in crop yields because of added pollination service
- Reduction of dependence on and costs related to rented commercial bees, such as the European Honey Bee.



Buzz pollination results in more abundant and larger fruit production.

Mace Vaughan, Xerces Society

Attracting Native Pollinators

PROVIDE THE BASICS: Food, Shelter, and Protection from Insecticides

➤ Food: Pollen and Nectar from Flowers

Plant pollinator-friendly flowering plants to attract native bees. These plantings should include native plants with varied bloom times to maximize the diversity of pollinators and provide a food source throughout the entire growing season.

These plantings can be part of a field border, riparian buffer, marginal production area, or a hedgerow.

➤ Shelter: Three Types of Bee Nests



Matthew Shepherd, Xerces Society

Two-thirds of all native bees are solitary *ground-nesting*. For these bees, limit tillage to only those areas where it is needed to avoid disturbing ground nest sites.

Since *wood-nesting* solitary bees make individual nests in beetle tunnels in snags (standing dead trees) or artificial nest structures, nesting tubes can be placed in habitat areas.



Mace Vaughan, Xerces Society

For *cavity-nesting* social bees, such as the bumble bee, make sure your landscape has some unmowed or wild areas, especially adjacent to hedgerows or forest edges.

Little-Known Fact: Most native bees are unlikely to sting because they don't have a communal nest to protect. The yellow jackets and other stinging wasps that eat rotting fruit or hang around picnic areas are not bees, nor are they significant pollinators (Xerces Society).



➤ Protection from Insecticides

Pollinators can be negatively affected or killed by pesticides, especially insecticides. To protect and attract pollinator populations, it is very important to limit or avoid using insecticides.

If you do need to use insecticides, carefully protect the pollinator habitat areas by:

- Minimizing use
- Using the least toxic formulation (see chart below)
- Avoiding application to flowering plants
- Always following the label
- Spraying during dry and calm conditions
- Spraying right after dusk when bees are least active if possible.

When using insecticides, choose the formulation that is least toxic to bees.

Formulation	Toxicity to Bees
Dust	Most Toxic ↓ Least Toxic
Wettable Powder	
Flowable	
Emulsifiable Concentrate	
Soluble Powder	
Solution	
Granular	Least Toxic

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BLUEBERRY BULLETIN

If you have any comments about this newsletter, please make them in the space below and mail to:

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6260 Old Harding Highway, Mays Landing, NJ 08330

I would like to see an article on the following subjects: _____

I would like to comment on the following articles: _____

Title: _____ Date: _____

Comment: _____

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