

RUTGERS

New Jersey Agricultural
Experiment Station

The BLUEBERRY BULLETIN

A Weekly Update to Growers

Dr. Gary C. Pavlis, County Agricultural Agent

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April 4, 2012

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At a glance. Insect and disease problems that should be considered this week.

PEST/DISEASE	APRIL 5-12 BEGIN BLOOM	APRIL 13 -20 FULL BLOOM
MUMMY BERRY Abound, Indar, Quash	Blueberries are still susceptible to primary infections. Scout for cups in wet areas. Strikes should start to be visible by April 10.	Continue scouting for strikes. Applications as necessary
ANTHRACNOSE Abound, Cabrio, Captan, Omega, Ziram	Begin applications when the flower clusters have expanded and flowers are greater than 20% open. Follow with a second application 7-10 days later	
PHOMOPSIS Indar, Quash	Last chance for applications this week. Use in fields where the disease was a problem in 2011	No further action required
LEAFROLLERS, SPANWORMS B.t., Intrep	Use pheromone traps to monitor adult flight. Scout for larvae. Treat if over 1 larva/100 clusters.	Continue scouting for larvae. Use same threshold.

BLUEBERRY TWILIGHT MEETINGS

TUESDAY, APRIL 24, 2012 @ 5:30
ATLANTIC BLUEBERRY CO
7201 WEYMOUTH RD., HAMMONTON, NJ
FOR DIRECTIONS, CALL 609-561-8600

TUESDAY, MAY 29, 2012 @ 5:30
PHILIP E. MARUCCI RESEARCH CENTER
125A LAKE OSWEGO RD.
CHATSWORTH, NJ
FOR DIRECTIONS, CALL 609-726-1590

CULTURE

Dr. Gary C. Pavlis, Ph.D.

Atlantic County Agricultural Agent

A few growers have called me because they had noticed problems with the emerging leaves in their fields. I visited a few of these fields and have noticed that the new leaves are reddish, deformed, with small black spots and black tips. The red coloration is undoubtedly due to low temperatures over the last few nights. The black spots and coloration I believe is also due to the cold. The spots do look a little like phytotoxicity so I asked the growers if they sprayed lime sulfur since bud break. So

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far, no one had so I'm going to stick with the cold damage explanation. My guess is that the plants will grow out of it without too much problem.



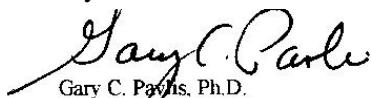
A reminder, the 2012 Commercial Blueberry Pest Control Recommendations for New Jersey may be picked up at any extension office or downloaded from the Rutgers NJAES web site at <http://njaes.rutgers.edu/pubs/>. Click on "All Fact Sheets & Bulletins" and scroll down to ID# E265.

Once again, if you have a problem during the season, please call me.

Any comments, suggestions, constructive criticism about The Blueberry Bulletin newsletter would be greatly appreciated. Also if you have any specific problems which you feel should be addressed, please let me know.

Help me to serve you better.

Sincerely,


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

Editor - Blueberry Bulletin/GP/slp

INSECTS

Pollination limitation of commercial blueberry in New Jersey

Rachael Winfree, Ph.D., Assistant Professor, Department of Entomology, Rutgers University New Brunswick
Faye Benjamin, Ph.D. Candidate, Graduate Program in Ecology and Evolution, Rutgers University New Brunswick

In our previous article for the Blueberry Bulletin, we described the numerous ways in which pollination has beneficial effects on fruit weight and fruit set in highbush blueberry. In this article, we present the results of an experiment we did in the Hammonton area in 2011 to test for pollination limitation in blueberry. Pollination limitation means a reduction in fruit production caused by insufficient pollination. To test for pollination limitation, we compared fruit set and weight between open-pollinated and hand-pollinated blueberries. The open-pollinated treatment estimates the "baseline" level of pollination received in a given blueberry field, while the hand-pollinated treatment represents a potential maximum amount of pollination. Any difference between the two treatments would suggest that individual flowers have room for improvement between current levels of pollination and a hypothetical maximum level of pollination. In our study, we found that both fruit weight and fruit set increased with hand-pollination, indicating that there is some pollination limitation in highbush blueberry, at least when measured at the flower scale.

Methods - We did our research at 16 conventionally-managed highbush

blueberry (*Vaccinium corymbosum*) fields in southern New Jersey. All study fields were monoculture stands of either “Duke” or “Bluecrop” cultivar. We conducted our experiments with previously unpollinated flowers. On the day before each experiment, we visited each blueberry field and haphazardly chose 18 clusters of flowers, each on a different bush, within two adjacent crop rows. We enclosed these clusters with pollinator exclusion mesh. On the next day, when new flowers had opened, we assigned these unpollinated flowers to one of two treatments, either open or hand pollinated. Open-pollinated (OP) flowers were left open to the ambient levels of pollination in the field. Hand-pollinated (H) flowers had their stigmas saturated with pollen collected from other bushes within the same field.

All berries were then allowed to ripen for 42 days (+/- 1 day) and were then harvested and brought into the lab. As our measure of fruit set, we used the number of berries produced per cluster, divided by the number of flowers in that cluster that were used in the experiment. To measure fruit weight, we weighed each berry to an accuracy of 0.001 g on the same day of collection. Fruit set data were analyzed using a logistic regression with a binomial distribution, with farm as the random effect. Fruit weight data were analyzed with a general linear model, also using farm as a random effect.

Results

We report results for a sample size of 421 berries. 218 berries were from 86 clusters of hand-pollinated flowers, and 203 berries were from 80 clusters of open-

pollinated flowers. For both cultivars, fruit set was significantly greater in hand-pollinated flowers than in open-pollinated ones. Across all farms, Bluecrop had 88% fruit set in hand-pollinated flowers, compared with 77% in open-pollinated clusters. Duke had 92% fruit set in hand-pollinated flowers versus 83% fruit set in open-pollinated flowers. Both cultivars also had significantly heavier berries with hand pollination. For Bluecrop, mean +/- SD hand-pollinated berry weight was 0.68 g (+/- 0.25 g), versus 0.46 g (+/- 0.22 g) for open pollinated flowers. For Duke, mean hand-pollinated berry weight was 1.03 g (+/- 0.25 g), versus 0.86 g (+/- 0.27 g) for open pollinated. A significant difference in average berry weight was found between open-pollinated and hand-pollinated berries in both Bluecrop and Duke. Thus, our results for both fruit set and fruit weight suggest that higher production might be achieved with increased pollination levels.

Discussion

Our results indicate that at the scale of the individual flower/berry, blueberry production benefitted from supplemental pollination: our hand-pollinated treatments had improved fruit set and fruit weight compared to our open-pollinated flowers. What is not clear from this experiment is whether these improvements translate to a bush-level or field-level increases in productivity. Supplemental pollination on a small number of flowers may stimulate the bush to shunt additional resources to those well-pollinated flowers, resulting in larger berries. In a flower-level experiment, such a result would be incorrectly interpreted

as pollination limitation, whereas in reality it was just the plant preferentially maturing the fruits that were better pollinated at the expense of other fruits. However, if pollination is truly limiting fruit production at the bush level, fruit production would also increase with supplemental pollen applied to the entire plant. We hope to address whether increased pollinator abundance affects yield at the field level in a study using supplemental honeybee hives, to be completed in 2013.

Dr. Cesar Rodriguez-Saona, Extension Specialist in Blueberry Entomology, Rutgers University
Mr. Dean Polk, IPM Agent – Fruit
Mr. Gene Rizio, IPM Program Associate – Fruit

Cranberry Weevil (CBW): Our beating tray samples are showing that 41% have been positive for any presence of CBW. Only 3% of samples were above threshold of 5/bush. During the previous week we saw 19% of samples over threshold. While the recent cooler temperatures have been helpful in reducing additional buildup of weevil, almost all of the sites that made up the initial 19% have been treated with a perimeter spray of Asana or Imidan. At this point the flowers are advanced enough (1st open flowers seen 4/2) that we do not expect much additional further buildup, although additional feeding is always possible.

Plum Curculio (PC): With the cooler weather, less activity was seen this week than the previous week. No adults were seen in any beating tray samples.

Lep. Larvae, including Spanworms: Low levels of spanworm were seen at only one site. No problems exist across our production area. Redbanded leafroller adults are flying. The eggs which these

moths are laying should be hatching soon, with larvae visible in a week or two.

RECOMMENDATIONS AND LABEL CHANGES

Guthion and azinphosmethyl - This is the last season for the use of Guthion/azinphosmethyl products, in accordance with the scheduled phase-out guidelines previously established by EPA.

Admire Pro - This is the Bayer formulation of all their imidacloprid materials for fruit. This step now completes Bayer CropScience's conversion of all Provado uses to Admire Pro. There is still some Provado in the channels of trade and that label is still legal.

Altacor - (DuPont). This is a new insecticide registered in blueberries. Its active ingredient, Rynaxypyr®, is from a whole new group of chemistry (Group 28) with no cross-resistance to other chemistries. Altacor is effective against lepidopteran pests including gypsy moth, leafrollers, spanworms, fireworms, and fruitworms. It controls hatching insects all the way through to adult stages of development and is easy on bees and beneficial insects. Please see the product label for complete information and application guidelines.

DISEASES

By Peter V. Oudemans, Ph.D.
Associate Professor and Extension Specialist
Plant Pathology

Blueberries have started blooming this week so mummy berry, anthracnose and Botrytis blossom blight are the major fungal diseases that will need to be managed. Remember scouting for mummy berry and Botrytis should precede any decision to spray.

For **mummy berry**, the shoot strikes will start being visible in the next week. In areas where these shoot strikes are present the open flowers will require protection from secondary infection. Cultivars such as Weymouth, Early Blue, Blueray and Jersey are very susceptible.

Applications of Abound, Indar, Pristine, Orbit, or Quash can be used to protect flowers and additional primary infections (see NJ Blueberry recommendations for rates). As bloom progresses the effectiveness of fungicide applications against mummy berry will decline since fungicides do not “cure” infections that have already occurred. For maximum control, fungicide applications should be made prior to mid-bloom. Any mummy applications made post bloom are a waste of time and money. Remember that fungicides such as Abound and Pristine are very effective against the secondary phase of the disease and provides efficacy against anthracnose.

For **anthracnose** management, the key is to start at early bloom. The first application used at early bloom should be Abound. This application will help prevent movement of the pathogen from its overwintering phase to the fruit. Subsequent fungicide applications should utilize protectant fungicides such as Captan or Ziram. It is my experience that Ziram provides a longer residual period and a 14-day interval is reasonable. Captan will require a 7-day interval. Fungicides such as Pristine or Captevate are effective for protecting against Botrytis and Anthracnose.

Botrytis blossom blight is a relatively rare disease. If cool wet conditions prevail during

bloom and pollination is slow there will be an increased danger of Botrytis. Slow pollination results in an extended bloom period and aging flower petals are very susceptible to infection. Growers who follow the suggested anthracnose management plan (protectant applications made at early bloom and 7-14 day intervals depending on the type of fungicide used) will see suppression of Botrytis. In the event that Botrytis develops this year materials such as Elevate (or Captevate), Pristine and Switch are all excellent materials.

Phytophthora Root Rot is currently active and applications of Ridomil or one of the phosphite fungicides (K-Phite, Prophyt, or Rampart) should be made to fields with infected bushes. Banded applications are recommended so that the material is applied directly to the susceptible root tissues. Foliar applications of phosphite fungicides are NOT recommended at this time since there is very little foliage. An application through the drip or using a drench application is more effective at this time of year.



Important stages of blueberry development for disease control. **A.** Leaf tissue is becoming less susceptible to mummy berry but infections can still occur. **B.** Blossoms are peak susceptibility to secondary phase of mummy berry. Anthracnose applications should begin at this stage.

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

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

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