2010 Annual Winter Meeting of the American Cranberry Growers Association

AMERICAN CRANBERRY GROWERS association

Rutgers University EcoComplex

Bordentown, NJ

Thursday
January 28, 2010

RUTGERS
New Jersey Agricultural Experiment Station

ACGA Winter Meeting Program
Thursday, January 28, 2010

8:00-8:30 Registration and Coffee

8:30-8:40 Welcoming Remarks– **Stephen Lee IV, President, ACGA**
Treasurer's Report **- Shawn Cutts**

8:40-9:00 **2009 Cranberry Statistics**
Troy M. Joshua, USDA, NASS

9:00-9:20 **Update on the Cranberry Breeding Project**
Nicholi Vorsa, Department of Plant Biology and Pathology, Rutgers University, *Jennifer Johnson-Cicalese*, Research Associate, *James Polashock*, Research Plant Pathologist, USDA-ARS

9:20-9:40 **Advancing Along the Edge of Fairy Ring Research**
Peter Oudemans, Department of Plant Biology and Pathology, Rutgers University**,** *James Polashock,* Research Plant Pathologist, USDA-ARS

9:40-10:00 **Current Entomology Research in Cranberries**
Cesar Rodriguez-Saona, Department of Entomology, Rutgers University

10:00-10:15 Break

10:15-10:35 **Dodder Control in Cranberries**
Bradley Majek, Department of Plant Biology and Pathology, Rutgers University

10:35-11:20 **New Developments in Remote Sensing**
Lee Fiocci Lee Rain Irrigation, Inc

11:20-11:50 **Pesticide Safety**
Ray Samulis, Burlington County Agricultural Agent, Rutgers University

11:50-1:00 Lunch

1:00-1:45 **Current Entomology Research in Massachusetts**
Anne Averill, Department of Plant, Soil, and Insect Sciences, University of Massachusetts

1:45 **Adjournment**- *ACGA Board of Directors Meeting*

UPDATE ON THE CRANBERRY BREEDING PROJECT

Nicholi Vorsa, Jennifer Johnson-Cicalese, and James Polashock

P.E. Marucci Center for Blueberry & Cranberry Research & Extension,
Rutgers University, Chatsworth, NJ 08019

Variety performance of Crimson Queen®, Mullica Queen®, and Demoranville® in 2009

Rutgers new varieties were established in half acre test plots in Browns Mills, NJ; Crimson Queen® was planted in Nov. 2003, Mullica Queen® in May 2004, and Demoranville® in June 2005. These plots were planted with rooted cuttings, maintained under standard grower practices and evaluated for yield, field fruit rot, TAcy and establishment. In 2009, the yields were: Mullica Queen® 419 bbl/acre, Crimson Queen® 286 bbl/acre, and Demoranville® 270 bbl/acre. Stevens and Ben Lear in contiguous beds yielded 320 and 276 bbl/acre, respectively. The most mature (4 yr) commercial beds of Crimson Queen® in Wisconsin yielded 340 and 628 bbl/acre. Three and four year old beds of Demoranville® in Wisconsin yielded 380 and 474 bbl/acre, respectively.

Release of cranberry selection CN95-20-20: a very early fresh fruit variety

The Rutgers cranberry selection, 'CNJ95-20-20', is now being released due to its desirable combination of traits for fresh market cranberries, including intense uniformly red to dark red fruit color in early season, extremely high anthocyanin (red pigment) content, a round to ovate berry, and exceptional fresh fruit quality relative to currently cultivated commercial varieties. 'CNJ95-20-20' was derived from crossing the variety Stevens as the seed parent, with the advanced selection 'NJS98-37' as the pollen parent. ('NJS98-37' is an advanced selection from Franklin x Ben Lear cross). This new variety was originally selected from 26 progeny growing in test plots in Chatsworth, NJ. Yields in a 5 year old ½ acre planting have been over 250 bbl/acre. A plant patent for CNJ95-20-20 is pending.

Fruit dry harvested October 4 was maintained in cold storage for 3 months and evaluated January 2010. The percent rotted or soft fruit was 13%. Plant material should be available for general distribution in 2011. Growers interested in ordering should indicate their interest early in 2010 for adequate time to develop sufficient materials. Signed Rutgers licensing agreements will be required.

Fig. 1. CNJ95-20-20 fruit harvested fall 2007,

Establishment methods for new varieties

With the release of new cranberry varieties, more and more growers are considering replanting older beds. However, because of the limited availability of the new cranberry varieties and the desire to maintain genetic purity, the traditional planting method (using 1-2 tons of plant material per acre) is less viable. In 2007, two trials were planted to test several establishment methods, taking into consideration quantity of plant material used, cost of planting, and maximizing rate of establishment. These methods used from 27 to 440 lbs of plant material per acre. Two densities of rooted cuttings were used (1 and 1.5/ft^2), and two planting dates (May & June). Four unrooted-cutting methods were used: 'Sticks' involved pressing 3" deep holes into the bed with a nail-covered board and then placing 6" unrooted cuttings into the holes; the holes were not pressed closed (2 densities, 2 and 4 sticks/ft^2, approx. 100 & 200 lb vine/acre); the 'Layed-out' method, where 8" vine pieces were laid on the bed in such a way that a modified disk would run over the middle of each vine to press it into the soil; and the 'Sprinkled' treatment, 8" vine pieces randomly sprinkled and then pressed in with a modified disk (approx. 440lb vine/acre). One trial used Mullica Queen®, and the other used Crimson Queen®.

As initial establishment observations indicated, the 'Sticks' treatments continued to do poorly, with significantly lower yield for both varieties. Pressing the soil against the cuttings may improve the establishment with this method. The 'Rooted cuttings' had better yields, although with Mullica Queen there were no significant differences between 'Rooted', 'Layed-out' or 'Sprinkled'. There was no difference in yield between the May and June planting dates, suggesting that the later planting date did not adversely affect establishment. In addition, the denser 'Rooted cutting' planting rate of 1.5 plants/ft^2 had little impact on yield, especially with Mullica Queen. The layed-out cuttings did surprisingly well and may offer potential, especially if automated in some way.

Breeding for field fruit rot resistance (USDA-SCRI Grant)

In May 2009, a trial was planted at the Marucci Center consisting of 1642 progeny from 55 crosses using field fruit rot-resistant (FFRR) parents and 57 replicated plots of fruit rot-resistant and susceptible genotypes. . Flower and fruit samples were collected weekly from 14 genetically diverse resistant and susceptible selections, and cultured for an analysis of the fungal community. Of the 1276 ovaries cultured, 62% were colonized by fungi, and a fungal community of 15 different species was present. Of the 1874 berries plated throughout the remainder of the season, 90% were colonized by fungi. These high percentages suggest that fruit of resistant genotypes are colonized by the fruit-rotting fungi, but for some reason rotting does not occur. Weekly samples were also frozen for analysis of proanthocyanidins, flavonols, and phenolic acids. Next-generation sequencing and identification of simple sequence repeats (SSRs) for genetic marker development in cranberry are underway. Thirty nine cranberry selections were propagated and planted in a replicated trial at the Pacific Coast Cranberry Research Station in Long Beach, WA, including 22 FFRR selections from Rutgers, 7 standard cultivars, and 9 advanced selections from Rutgers. Plant growth ratings indicated several selections have excellent early vigor. Ten advanced selections were propagated and shipped to Whiskey Creek Cranberry Co., Warrens, WI in June to complete planting of a replicated evaluation trial.

ADVANCING ALONG THE EDGE OF FAIRY RING RESEARCH

Peter Oudemans[1], Jennifer Vaiciunas[1], James Polashock[2], Donna Larsen[1], Christine Constantelos[1], and Lindsay Wells[1]

[1]PE Marucci Center, School of Environmental and Biological Sciences, Rutgers University, 125a Lake Oswego Road, Chatsworth, NJ, 08019,
[2]Genetic Improvement of Fruits and Vegetables Lab, USDA-ARS, 10300 Baltimore Ave, Beltsville, MD, 20705-2350, USA

Fairy Ring is a disease of unknown etiology that causes significant loss to cranberry farmers. The disease develops as an expanding ring killing vines at a rate of ~50cm radius per year. New rings form on individual cranberry beds at a rate of 1-3 per year, and the disease can spread to new beds where it was not present during the previous growing season. The internal portion of the ring never recovers to full yield potential and the affected areas are an entry point for weed species into the cranberry bed. The affected areas also show greater levels of fruit rot and this may lead to increased seed deposition. Germination of the cranberry seeds leads to establishment of unselected cranberry genotypes with lower yield potential. The combined effect of ring expansion, vine death and growth of vigorous, low bearing genotypes causes the life span of cranberry beds to be significantly reduced. Thus, the impact of fairy ring to cranberry farming is multifold. The first step in developing a more effective control program is to positively identify the casual agent. A fungus was recently isolated and confirmed to be the causal agent. It has been identified as *Helicobasdium* sp. based on DNA sequence analysis. A complete description of the disease cycle along with opportunities for control will be presented.

Fruit Rot continues to be one of the major foci for research in our lab. Recently we have discovered that efficacy of newer fungicides can be improved by combining two modes of action in one application. Use of Indar and Abound together represents a significantly increased cost however this cost seems to be justified in terms of yield increases. In this talk use of Indar and Abound will be discussed.

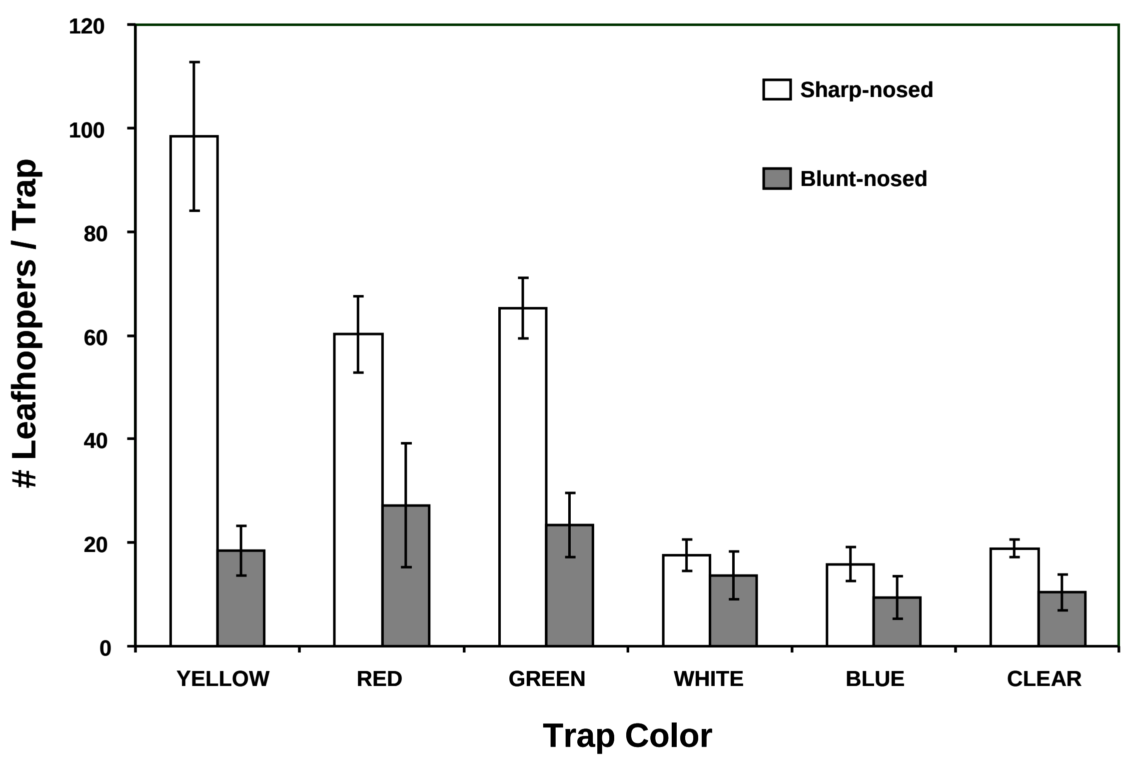
Aerial Spray Applications are by far the most common and economical method for applying pesticides and fertilizer. There are often difficulties in distribution. This year we have investigated distribution patterns using lower amounts of diluent as well as GPS tracking. Results of these demonstration trials will be discussed.

CURRENT ENTOMOLOGY RESEARCH IN NJ CRANBERRIES

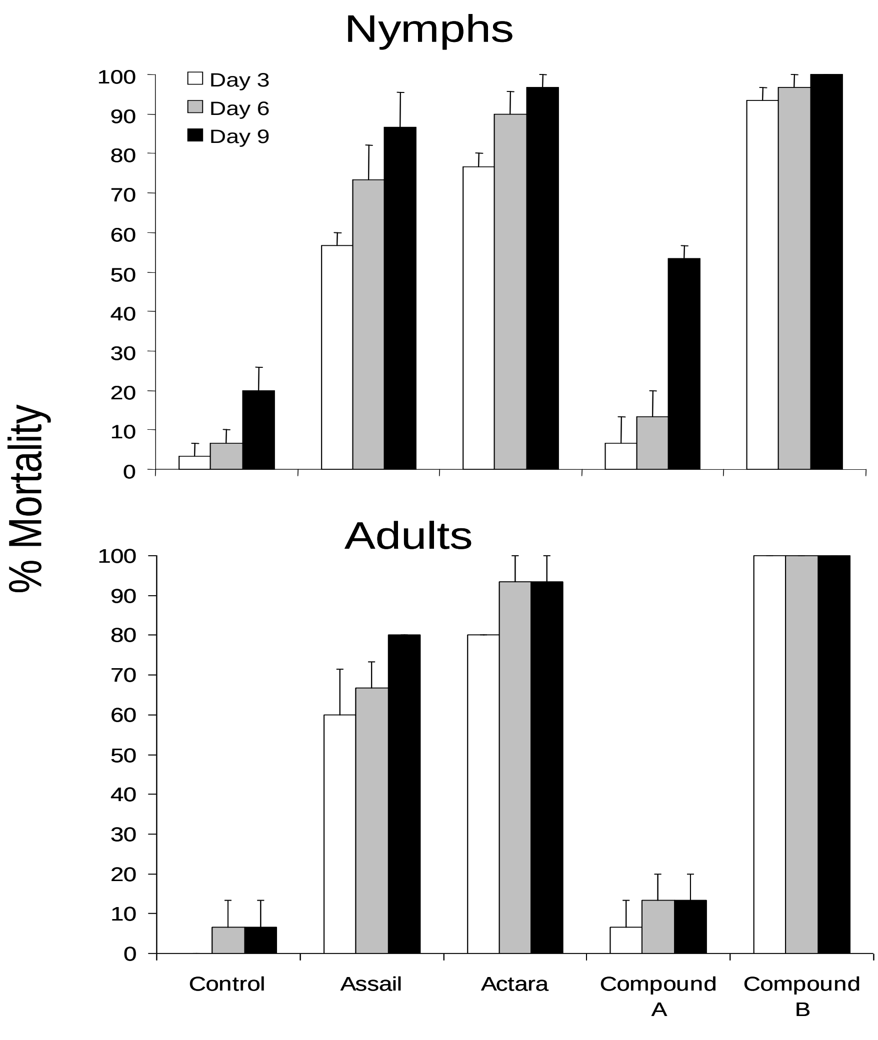
Cesar Rodriguez-Saona, Robert Holdcraft, and Vera Kyryczenko-Roth

P.E. Marucci Center for Blueberry & Cranberry Research & Extension,
Rutgers University, Chatsworth, NJ

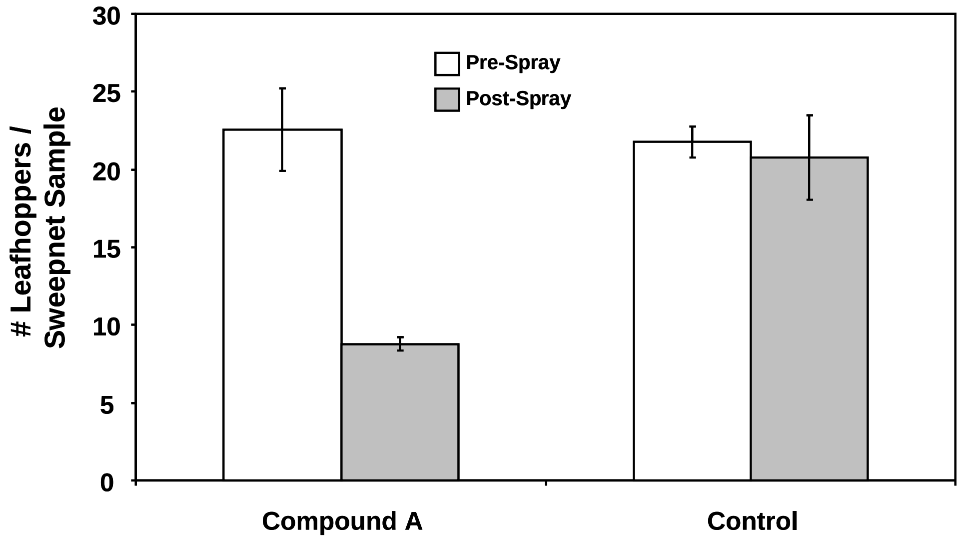
New methods for monitoring blunt-nosed leafhoppers in cranberries. Field experiments were conducted to examine the attraction of blunt-nosed leafhoppers to different color traps in commercial cranberry fields. Six colors were tested for attraction: blue, red, yellow, green, white, and transparent (control) from the second week in July through the second week in August (peak adult flight). A set of six traps, one of each color, was placed in one cranberry bog. Each set was replicated 5 times. Traps were checked once a week in the lab for the presence of leafhoppers. Although no significant differences were found among colored traps, numerically higher blunt-nosed leafhoppers were caught on red and green traps. This study will be repeated in 2010.



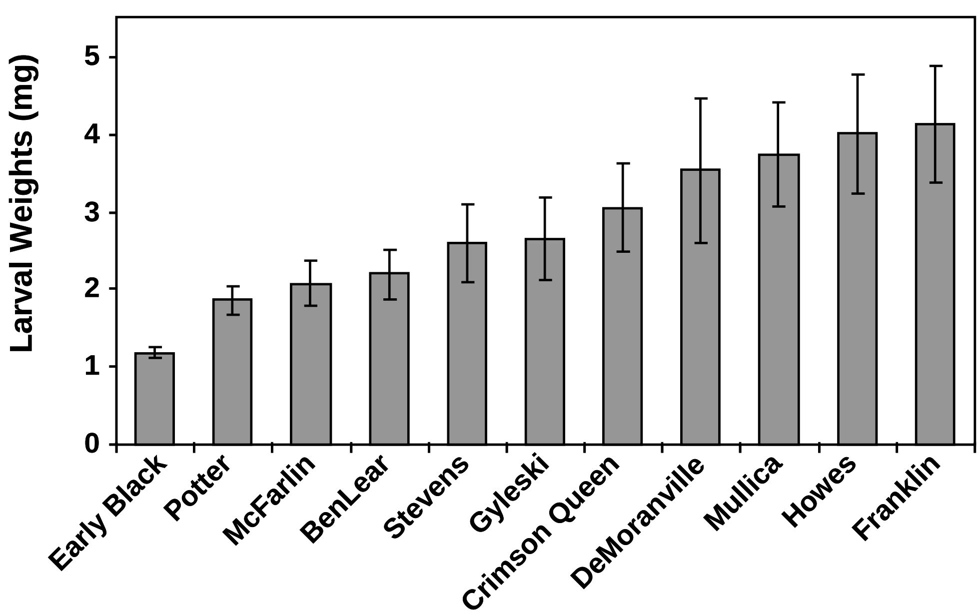
Laboratory trial for blunt-nosed leafhopper control: Base-level toxicity of Assail (4 oz/acre), Actara (3 oz/acre), Compound A, and Compound B were evaluated against leafhopper nymphs and adults in the laboratory on cranberry treated foliage and compared to untreated foliage. Insecticide treated and untreated uprights were inserted in florists' water picks, enclosed in a ventilated 40-dram plastic vial, and secured in Styrofoam trays. Mortality was assessed 3, 6, and 9 days after transfer. Assail, Actara, and Compound B provided good control against nymphs and adults. Compound A provided only 50% control of nymphs after 9 days.



***Field trial for blunt-nosed leafhopper control**:* We evaluated the efficacy of a pre-bloom application of Compound A against blunt-nosed leafhopper nymphs. A cranberry bog located at the Rutgers Blueberry/Cranberry Center was divided into 6 plots. Half of the plots received one treatment (Compound A), while the other half were untreated controls. Application was made on 6 June. Sweepnet samples were taken from each plot on 4 June (pre-treatment) and 29 July (post-treatment). Compound A provided 57% control against blunt-nosed leafhopper after insecticide application.



***Cranberry Resistance against Gypsy Moth**:* A study was conducted to test the susceptibility of new high-yielding cranberry varieties against gypsy moth larvae. These new varieties tended to be more susceptible than many of the old varieties. Future studies will be conducted to test the susceptibility of these varieties against other cranberry pests.



QUINCLORAC FOR DODDER CONTROL IN CRANBERRIES

Bradley A. Majek

Rutgers Agricultural Research & Extension Center
121 Northville Rd. Bridgeton, NJ 08302

Abstract

Weeds continue to cause serious problems in cranberry (*Vaccinium macrocarpon* Ait.) production. Greenhouse and field screening has identified quinclorac as a potentially useful herbicide for use in cranberries with good crop safety more than ten years ago. Good crop safety has been observed at up to 1.0 lb ai/a applied to dormant cranberries in early spring or to actively growing and blooming cranberries in late spring or early summer. Experiments conducted to evaluate the control of serious cranberry weeds in growers' bogs have indicated that quinclorac has the potential to control weeds that cannot currently be easily controlled in cranberries. Applied at 0.25 to 0.5 lb ai/a, quinclorac has controlled swampcandle (*Lysimachia terrestris* (L.) B.S.P.), also known as yellow loosestrife to cranberry growers, when applied in early summer after cranberry bloom and near or shortly after the weed blooms. False nutsedge (*Cyperus strigosus* L.) was controlled quinclorac was late spring or early summer. Dodder has been an increasing problem in cranberry bogs in recent years, since the cancellation of the chloropropham registration for cranberries. Pronamide, applied twice, provided excellent dodder control in cranberries through section 18 Emergency Exemptions, but the request was denied in 2009. Quinclorac applied at 0.25 lb ai/A plus 1 percent oil concentrate was evaluated for dodder(*Cuscuta gronovii* Willd.) control in cranberries in 2009. The herbicide was applied in June after dodder had germinated and begun to attach, in July after attachment, and at both timings. The June application initially controlled dodder, but recovery was evident by August. Dodder bloom was delayed from late July to mid August, but not prevented. The application of quinclorac in July did not control dodder. Two applications of quinclorac, in June and in July was the only treatment that provided season long dodder control. The failure of the July treatment to control dodder strongly indicates timing of the application is critical to obtaining acceptable control. Quinclorac, applied earlier in the spring before attachment and at or immediately before dodder germination, followed by a second application in early summer, is likely to provide the best control and need to be evaluated further.

CURRENT ENTOMOLOGY RESEARCH IN MASSACHUSETTS

Anne L. Averill

Department Plant, Soil, and Insect Sciences
University of Massachusetts, Amherst, MA

Abstract

Cranberry fruitworm management, evaluation of new insecticides, insecticide residue studies in fresh fruit, and the status of native bees are covered in this talk. Timing of cranberry fruitworm male moth flight and egglaying was evaluated from the standpoint of IPM recommendations that rely on plant phenology. Currently, we use percent out-of-bloom calculations, or determination of fruit set progress, to time two prophylactic insecticide sprays, usually in July. Sampling of berries to determine egg infestation is utilized to check the need for subsequent applications. These recommendations are most effective for the late cultivar Howes. However, assessment of success on the early large-fruiting culivars, Stevens and Ben Lears, was needed. Our work showed that a shifting of the recommendation was needed for early cultivars, and that spray timing should be moved up to a point when beds are at 50% fruit set. Because flowers are still present and the most common sprays are broad-spectrum conventional compounds, this poses unacceptable bee kill hazard, particularly for native bees that forage earlier and later in the day and when the beds may be wet. Two spray trials showed that Assail, Delegate, Intrepid, and unregistered anthranilic diamides (registration of one expected in coming years) were more or equally as effective against cranberry fruitworm as Diazinon and Lorsban. Intrepid and the diamides are not toxic to bees and it is anticipated that growers will shift to these compounds for the earliest sprays. Studies also showed that Lorsban residues in fresh fruit are detectable if used for fruitworm management. A large survey of native bees showed that diversity has declined over the past 20 years, but abundance has remained steady. Work at 32 beds showed that honey bees competition and surrounding land use (% agricultural and forest surrounding each site) impact native bee populations. Assessment of insecticide impacts in ongoing, and development of BMPs for pollinator conservation are in the works.