RUTGERS COOPERATIVE RESEARCH & EXTENSION AT THE NEW JERSEY AGRICULTURAL EXPERIMENT STATION

PLANT & PEST ADVISORY

CRANBERRY EDITION $1.50 JUNE 15, 2006

INSIDE

Cranberry Fruit Rot

Peter V. Oudemans, Ph.D., Specialist in Plant Pathology

Field rot is a major threat to cranberry production and if left uncontrolled may cause crop losses in excess of 50%. The most effective control measures rely on nonselective, protectant fungicides including ferbam, mancozeb, and chlorothalonil. In a typical commercial setting, four to five fungicide applications are made during the growing season and resultant field rot levels range from <1 – 15%. Currently, fungicide applications begin during early bloom (June 1 – 15 in New Jersey) and are repeated on a seven to fourteen-day schedule. Field-rotting fungi generally infect early in the growing season and remain latent until the fruit begin to ripen. One exception is the fungus *Phyllosticta vaccinii,* which causes an early fruit rot as well as a variety of other symptoms including leaf drop and blossom blight.

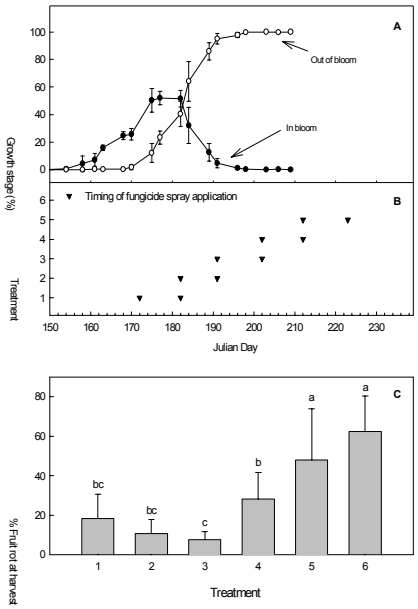

Fig. 1. Results of an experiment demonstrating the effect of fungicide timing on fruit rot control. A) Represents the phenology of the cranberry crop. In bloom and out of bloom represent the stages of flower development. B) Shows the timing of fungicide applications. Treatments (Y-axis) each included two applications of chlorothalonil and were staggered at 10-12 day intervals. C) Levels of fruit rot observed at harvest. Treatments (X-axis) correspond with treatments (y-axis) in panel B. Treatment 6 is the control and no fungicides were applied.

In field experiments conducted over three years the timing of fungal infections leading to fruit rot was found to be concentrated around the period immediately following bloom (Fig. 1). Fungicide applications initiated during early fruit set, which corresponds to late bloom showed the greatest efficacy. Treatments initiated after this time showed progressively less effect on disease control (Fig. 1 and 2). These results suggest that infection must occur within a short window of time in order for fruit rot to occur. Infections

SEE FRUIT ROT ON PAGE 2

FRUIT ROT FROM PAGE 1

occurring later have less chance of developing into field rot, however, those infections may result in **storage rot**. Based on these results the effect of delaying fungicide applications will, after a certain point, result in a loss of control. Fig. 2 shows the relationship between the delay of fungicide applications and level of fruit rot control. This emphasizes the importance of timely applications for maximum benefit.

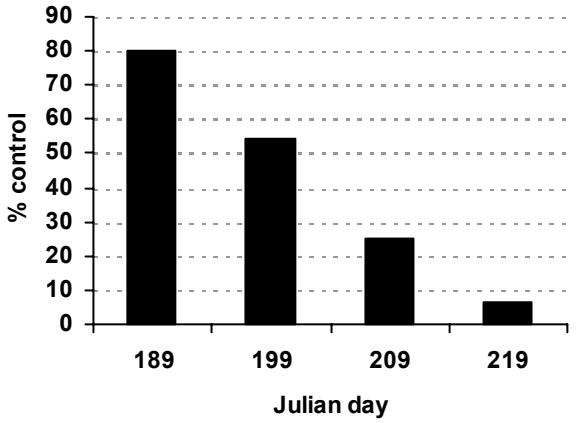

Fig. 2. Effect of delaying fungicide applications on the level of fruit rot control. Applications initiated on day 189 provided nearly 80% control whereas applications initiated on day 219 gave less than 10% control.

Fungicides

Fungicides registered for controlling fruit rot are listed in Table 1. These fungicides are registered, however, in planning a fruit rot management program one should always observe the preharvest intervals as well as recommendations made by a particular handler. The fungicides chlorothalonil and mancozeb have the greatest effect on cranberry fruit rot control. Ferbam, and copper containing compounds tend to be less effective. There is little difference among the different formulations of chlorothalonil and formulation should reflect an individual preference with regards to ease of handling, and cost. The interval is the time between fungicide applications required for continuous protection.

Summary on the timing of fruit rot infection

- Infection leading to fruit rot occurs during a 20 to 30-day period beginning at fruit set (~July 1).
- Infections that occur following this 20 – 30 day period (~Aug. 1), however, do not lead to field rot.
- Fungicide applications made during fruit set (~July 1) have the greatest effect.
- Delay of initial applications beyond fruit set (~July 15) will permit greater levels of fruit rot to develop.

Phytotoxicity

Fungicides useful for cranberry fruit rot control are broad-spectrum materials. These fungicides will damage plants if they can enter the plant cell. However, these materials are formulated such that they do not cross the cuticle and enter the cell. Therefore, mixing pesticides and use of additives should be done with caution because this can alter the characteristics of the formulation and result in phytotoxicity. In particular some of the newer insecticides being registered have additives to enhance uptake. Mixtures with those insecticides and current fungicides will result in phytotoxicity.

Two fungicides, chlorothalonil and mancozeb can cause phytotoxic effects, however when used properly these effects can be minimized and fruit rot can be held in check.. In 2006 we have experienced relatively cool temperatures which reduce the risk of phytotoxicity due to chlorothalonil.

Rules for avoiding phytotoxicity

Rule 1. Chlorothalonil should be used after the majority of cranberry fruit are set (out of bloom)

Rule 2. Chlorothalonil should not be used if the projected bed temperatures for that day are expected to rise above 90°F especially during the bloom period.

Rule 3. Do not mix chlorothalonil with compounds designed to enhance uptake.

Rule 4. Do not use mancozeb after fruit are over a ¼ inch in diameter.

Table 1. Fungicides effective for cranberry fruit rot control

Fungicide	Formulations	Interval	Effectiveness	Phytotoxicity
Azoxystrobin	Abound	7-10 days	Effective	None reported
Chlorothalonil	Bravo, Terranil, and several others	10-14 days	Very effective under high disease pressure	At high temperatures (>90°F) blossom damage can occur. Fruit scarring has been noted
Ferbam	Ferbam	7-10 days	Effective	None reported. Can leave a black residue
Mancozeb	Dithane, Manzate	7-10 days	Very effective	Reduces color development
Copper	Champ, Kocide	5-7 days	Effective under low disease pressure	None reported from cranberry. Can cause scarring on fruit at high rates

Insect Update

Cesar Rodriguez-Saona, Ph.D., Specialist in Entomology

Most cranberry beds are currently coming into bloom. If insects have been effectively managed prior to bloom, we recommend no sprays at this time. A reminder: when bees are present your only choices of insecticides are Confirm 2F, Intrepid 2F, or DiPel.

Because of potential damage to flowers, we have stopped our sweep net samplings. We are currently monitoring insect populations using pheromone and sticky traps. Pheromone traps are being used to monitor adult male **spotted fireworm**, **sparganothis fruitworm**, and **blackheaded fireworm**. Sticky traps are being used to monitor **blunt-nosed leafhoppers**.

So far our pheromone traps indicate activity of adult spotted fireworm and blackheaded fireworm.

Spotted fireworm - Incidence of this insect has decreased over the last years. We attribute this decline to the role that natural enemies play in the suppression of spotted fireworm populations. Although few of our pheromone traps caught several adult males, we have not found any egg masses in those same bogs. Egg masses of spotted fireworm can be easily detected on the upper surfaces of weed leaves (red maple, green brier, leatherleaf, loosestrife, red root, etc) on the beds and dams. Managing weeds around and in the bog can prevent spotted fireworm infestations. If eggs are not observed, then the second generation larvae should not be a problem.

Sparganothis fruitworm - our pheromone traps show no adult male activity in beds that we are monitoring. Pheromone trap catches of this insect have declined over the last five years (data provided by Dan Schiffhauer, Agricultural Specialist, Ocean Spray Cranberries). This decline can be attributed to an increased use of selective, reduced-risk insecticides such as Confirm and Intrepid, and a decreased use of broad-spectrum insecticides. The use of selective insecticides, besides being effective against lepidopteran pests, has helped natural enemy populations to build up.

Pheromone Trap in a Cranberry Bog

A sticky trap for monitoring blunt-nosed leafhoppers

Weather Summary for the Week Ending 8 am Monday 6/12/ 6

	RAINFALL			TEMPERATURE				GDD BASE50		MON
WEATHER STATIONS	WEEK	TOTAL	DEP	MX	MN	AVG	DEP	TOT	DEP	%FC
CANOE BROOK	1.15	10.94	-3.16	76	50	63.	-4	731	237	93
CHARLOTTEBURG	1.56	12.29	-1.78	73	48	60.	-4	557	192	95
FLEMINGTON	1.15	13.17	-.23	77	50	63.	-5	707	191	94
NEWTON *	missing									
FREEHOLD	1.08	12.72	-.55	77	48	62.	-7	713	120	92
LONG BRANCH	1.63	13.31	-.20	77	50	63.	-5	632	96	91
NEW BRUNSWICK	1.17	12.56	-.45	78	49	63.	-6	765	131	94
TOMS RIVER	.98	9.83	-3.37	78	48	64.	-3	702	165	86
TRENTON	.90	11.16	-.87	77	51	64.	-6	791	117	84
CAPE MAY COURT HOUSE	.37	6.32	-5.35	78	51	64.	-4	723	122	59
DOWNSTOWN	1.24	7.66	-4.27	77	50	64.	-6	772	74	92
GLASSBORO	.55	9.28	-3.53	77	54	65.	-5	899	222	79
HAMMONTON	.98	8.43	-4.04	79	52	65.	-5	827	159	89
POMONA	.56	8.72	-2.79	79	48	64.	-5	739	133	71
SEABROOK	missing									
SOUTH HARRISON	1.09	8.61	-4.09	77	54	65	NA	894	NA	NA

*some past data is missing and therefore cumulative values and departures will be off.

WES KLINE — GDD BASE 40 PINEY HOLLOW LAST WEEK 229 (Ending 6/5/06) THIS WEEK 167 (Ending 6/12/06)

NJ AGRICULTURAL EXPERIMENT STATION
RUTGERS
COOPERATIVE RESEARCH & EXTENSION
Plant & Pest Advisory
Rutgers' Cook College
18 College Farm Road
New Brunswick, N.J. 08901-8551

FIRST CLASS
POSTAGE PAID
PERMIT #576
MILLTOWN, NJ 08850

PLANT & PEST ADVISORY

CRANBERRY EDITION CONTRIBUTORS

Philip E. Marucci Center for Blueberry and Cranberry Research & Extension (609-726-1590)
Bradley A. Majek, Ph.D., Weed Science
Peter Oudemans, Ph.D., Plant Pathology
Cesar Rodriguez-Saona, Ph.D., Entomology
Nicholi Vorsa, Ph.D., Breeding, Genetics and Culture

Rutgers Cooperative Exension Agricultural Agent
Raymond J. Samulis, Burlington County (609-265-5050)

Ocean Spray Cranberries, Inc.
Dan Schiffhauer, Agricultural Specialist

Newsletter Production
Jack Rabin, Associate Director for Farm Services, NJAES
Cindy Rovins, Agricultural Communications Editor

For back issues, visit our web site at:
www.rce.rutgers.edu/pubs/plantandpestadvisory