



Newsletter Extension

Fruit ICM News

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Calendar

June 9: Plasticulture Strawberry, Blueberry, Blackberry, Raspberry Twilight Meeting; OSU South Centers, 1864 Shyville Road, Piketon, Ohio 45661. Field tours are from 5:00-7:00 p.m.; supper will be served from 7:00-8:00. Contact Brad Bergefurd, at 740-289-3727, 1-800-297-2072 (in Ohio only). E-mail: bergefurd.1@osu.edu. Web site: <http://www.southcenters.osu.edu>.

June 25: Ohio Fruit Growers Society Summer Tour, Glen Hill Orchard, 17156 Glen Road, Mt. Vernon, OH. See last week's issue for information.

Biofixes Revisited

Oriental fruit moth: Columbus, April 22
North-central Ohio, April 24

Codling moth: Columbus, April 30

Delete the May 1st for northern Ohio, as early flight was not sustained.

Shoot Fire Blight Management with Apogee

Source: 2003 Commercial Tree Fruit Spray Guide

Apogee (prohexadione calcium) inhibits gibberellin biosynthesis, resulting in an early cessation of terminal growth. Shoots with inhibited growth are less susceptible to fire blight; therefore, the potential for the build up of fire blight during the summer is reduced significantly. Consider using Apogee to reduce the threat of shoot blight on vigorous trees of susceptible varieties that have nearly filled their tree space. Apogee only decreases host susceptibility; it does not affect the pathogen directly. Apogee is not a substitute for streptomycin during bloom for blossom blight control. If needed, Apogee can be combined with streptomycin in one of the bloom sprays.

Timing: Apogee 27.5 W should be applied at full bloom to early petal fall on the king blooms for maximum effectiveness. Apogee is considerably less effective if applied too late. The decrease in blight susceptibility will not occur until about 10 days to 2 weeks after application.

Application rate and number: A rate of 36 to 48 oz. of Apogee 27.5 W per acre is recommended for trees that require 300 to 400 gallons of dilute spray per acre, respectively, or 12 oz per 100 gallons of dilute spray. The effectiveness of lower per acre rates for blight control drops off quickly. In the Midwest, one application of Apogee should be sufficient for preventing fire blight spread in the summer, but overly vigorous trees may need a second application (see label).

Additives: The non-ionic surfactant Regulaid should be used with Apogee. Follow the manufacturer's rate recommendations. If Apogee is being applied in hard water (water that contains high levels of calcium carbonate), 1 lb. of spray-grade ammonium sulfate (AMS) should be used for each pound of Apogee.

Comments: Growth control with Apogee is not concentration dependent. There is no difference in shoot growth control between dilute and concentrate sprays, provided the total amount of chemical per acre is the same. The level of growth control with Apogee is rate dependent. The greatest and quickest reduction is obtained at the recommended rate, and the effect on growth declines as the rate is reduced.

Editor's Note: An excellent two-part Apogee Update appeared in issues 6 and 7 of the 2002 Ohio Fruit ICM News. These articles are archived at: <http://www.ag.ohio-state.edu/~ipm/fruit/previous.htm>

Spartan 4F Herbicide Controls Groundsel in Strawberry Ohio Section 18 for 2003

Source: Richard C. Funt, Department of Horticulture and Crop Science, The Ohio State University

The Ohio Fruit Team has requested and the USEPA has granted a Section 18 to the Ohio Department of Agriculture for the use of Spartan 4F Herbicide (EPA Reg. No. 279-3220) to control common groundsel in strawberries. Spartan 4F herbicide contains 39.6% sulfentrazone and is manufactured by FMC Corporation.

Growers can apply 4 to 8 fluid ounces of product, but no more than 8 ounces of Spartan per acre/per application and a maximum of 12 fluid ounces per acre per year. A split application of Spartan 4F is recommended at renovation (June 20 to July 20, 2003) and dormancy from October 15 to December 15, 2003.

Sulfentrazone is known to leach to soil ground water. Do not use on coarse soils, such as sand which has

less than 1% organic matter.

Spartan 4F herbicide should not be applied to green strawberry leaves. This herbicide can cause damage to leaves and should be used after leaves have been removed by mowing at renovation and within 48 hours of mowing before new leaves form. It should be used after three hard frosts (24 to 26 degrees F) in the fall after plants (leaves) are dormant. Spartan 4F herbicide has been tested in Ohio and has shown excellent results for common groundsel. Spartan 4F is a selective soil applied herbicide for certain broadleaf weeds, grasses and sedges. The mode of action involves uptake by weed roots and shoots. It requires rainfall or irrigation (at 0.5 to 1.0 inches) to be activated or shallow incorporation within 7 to 10 days after application. Do not apply after December 15 or 105 days before harvest. Do not apply to saturated soils. Do not apply if heavy rainfall is predicted to occur within 24 hours following planned application.

We appreciate the very supportive role of Mr. Howard Guscar, FMC representative. He can be reached at 937-667-5162 or mobile phone 937-830-7481.

Plum Pox Virus (PPV) Some New Facts

Source: A literature review by Dr. Roumen Conev, Dr. Neil Miles, and Dr. Jayasankar Subramanian, University of Guelph, Plant Agriculture Vineland, The Tender Fruit Grapevine, Volume 7, Issue 4, March/April 2003

The time since June 2000 was quite hectic for both orchardists and nurserymen in Ontario and especially in Niagara. The stunning discovery that the so called Sharka disease is not just present but is well established in the heart of the main stone-fruit region of Canada was followed by the only known effective cure to date removal of the infected trees or entire blocks.

The good news is that Canada has the shortest history on the long black list of PPV contaminated countries, and that immediate and energetic measures towards eradication of the disease and application of a Domestic PPV Certification Program were taken. The bad news is that if these measures are not complete, co-ordinated, and adequate, the future of the domestic stone fruit industry is in danger. The situation in some regions in the Balkans, where the disease was uncontrolled for decades, is a good example for the devastating potential of this pathogen.

A regular flow of information to farmers is of primary significance to the achievement of joint unidirectional actions of all the interested parties towards eradication of the disease from the infected areas. An excellent job was done so far by federal and provincial extension, as well as inspection and research structures. A number of fact sheets, leaflets, web-postings, and other informative materials were published and distributed in Ontario. In this review we present the most recent scientific news analyzed from a horticultural point of view.

A significant progress is reported from a Czech-American and a Spanish-American research team towards the identification of molecular markers linked to resistance of apricot to PPV, as well as on genetic mapping of PPV resistance in apricot. Obviously, the revealing of the inheritance pattern of PPV resistance and the identification of its genetic loci in apricot is just around the corner. At any rate, these results indicate that there are reliable natural sources of resistance to PPV, which in turn supports the concept that the problem with this pathogen can be solved by traditional breeding as well. Strong evidence supporting this fact is provided by a recent study carried out in Italy, which states that the new apricot variety 'Bora' - a cross between 'Early Blush' (NJ A 53) and PA 7005-2 (Rival PA 63-265) is resistant to both D and M strains.

Several publications from 2002 trace the on-going spread of Sharka disease worldwide, and confirm the importance of establishing PPV certification programs in the countries already infested with PPV. Australian Quarantine and Inspection Service reports a new successful act of prevention against the importation of PPV contaminated material into Australia. The Australian inspectors detected PPV in an illegal consignment of plum budwood and fruit intercepted by AQIS at Sydney International Airport. PPV was detected in leaf, bark, and peduncle tissue in these intercepted materials using enzyme linked immunosorbent assay (ELISA), reverse transcription-polymerase chain reaction (RT-PCR), and electron microscopy. The strain of PPV detected was the D strain. Australia is among the few countries with a significant stone fruit industry that is still presumably free of Sharka disease.

The most efficient form of virus control in stone fruits is the use of clean material in establishing orchards. A recent report from Chile, where PPV was first discovered in 1992, is an excellent illustration of this fact. Samples from mother plants and propagating materials were collected in 11 nurseries in the Central zone of Chile, during the 1997 through 2000 growing seasons. At each site, samples were taken from individual plants, and tested by ELISA to quantify the incidence of 4 typical stone fruit viruses, including PPV. A total of 13,609 samples were collected, and the results showed differences in average viral incidence among the nurseries ranging between 2.0 and 17.7%. The average incidence of PPV infection was 4.2%.

Poland, which has a territory 170 times that of the Niagara region, reports the encouraging fact that it is successfully implementing an eradication program 37 years after the discovery of PPV in the country. Since 1998, all nurseries, scion blocks and rootstock crops, commercial orchards, as well as other crops of PPV host plants (small orchards attached to homesteads, allotment gardens and wild Sharka hosts) are being regularly inspected using unified procedures of sampling. Each infected tree is removed. Extremely strict measures are taken in mother blocks and nurseries, where the detection of PPV leads to the prohibition of the use of plants for further propagation until the place is recognized as disease-free. These stringent measures resulted in the complete eradication of Sharka from scion orchards as well as in the elimination of the commercial movement of the infested plant material originating from mother blocks or nurseries.

Recent studies are reported also in the field of internal (within a plant) and spatial distribution of the disease and on PPV strains and isolates diversity. Research on the systematic spread of PPV in a plant, using Mariana plum GF 8-1 as a model, was carried out in France to study what the viral impact would be on shoot growth.

This study confirms that:

- Virus distribution is uneven within the tree and branches;
- Shoot growth is unaffected by the presence of the virus;
- Symptoms appear on leaves in the most actively growing parts of the shoots, i.e. at the beginning of the season;
- PPV is also detected in leaves other than those showing symptoms;
- The proportion of leaves with detectable virus decreased from the shoot zone showing symptoms, with 100% ELISA-positive responses, to the shoot tip with no detectable virus in leaves produced between the 111 and 127 days after inoculation;
- A higher proportion of positive ELISA results is obtained below the zone showing symptoms (77%) compared to above this zone (50%);
- PPV was detected in 95% of the most vigorous shoots 71 days after inoculation compared with 37% of slower-growing, later-produced shoots.

The influence of infecting a single tree by PPV on the further spread of the disease within a plum

orchard was studied between 1993 and 2000 in Bohemia, Czech Republic. It was found that the infection of a tree significantly increased the risk of infection of neighbouring trees, despite the fact that all infected trees were immediately discarded when found with symptoms. According to the authors, trees adjoining within the row have 3 times higher risk of acquiring the disease compared to average rate of infection of plum trees in the same orchard, and those between adjoining rows are at 2 times higher risk. This proves the significance of prompt tree removal, immediately upon confirmation of its PPV positive status.

In another study the same authors conclude that:

- A source of infection is most contagious if it is located within 30 meters of the healthy trees;
- A plum tree is most susceptible to infection at the age of 3;
- Young seedlings on their own roots are more susceptible than grafted trees.

The significance of herbaceous plants as potential PPV hosts and their contribution to PPV epidemiology is still questionable in America. However, in Europe there are new findings published, that prove weeds can, in fact, be naturally PPV infected.

Bulgarian researchers confirmed the occurrence of in-orchard infected plants of Shepherd's Purse, and added the following new species to the list of PPV positive weeds found in field: Prickly Lettuce, Corn Gromwell, Yellow Dock, and Ivy-leaved Speedwell.

A very interesting study on PPV variability is reported from Slovakia, where 12 local and French PPV isolates were compared by using state of the art techniques. The most striking result was that the Slovak viral isolate BOR-3 was found to be a natural recombinant between D and M strains. This fact comes to remind us that we are dealing with a living structure "built to survive" - with high adaptive potential and changeability, so it is reasonable to speculate that the existing genetic variability in PPV is much higher than described in the literature within the narrow limits of strains D, EA, M, and C only. The fact itself, that Sharka disease has been known in Europe for almost a century, and did not affect cherries until the 1990's when a new strain PPV-C was found, is evidence that this virus continues to change and to conquer new host species. Actually, it is not necessary to go overseas in search of evidence for this hypothesis. It is enough to take a look at our own back yard. A plum tree infected with a PPV isolate, different from all strains known to date, was found in a Stoney Creek residential property during the 2002 PPV homeowners' survey. Its genetic identification is currently in progress at CFIA's Centre for Plant Health, Sidney, BC.

Thinning Peaches

Source: Dr. Rob Crassweller, Dept. of Horticulture, PSU, Fruit Times for May 6, 2003, Volume 22, No. 6

While we have many good post-bloom chemical thinners for apples, we do not have any for peaches. Therefore, the only method available is to thin the fruit by hand. The earlier you perform the job, the greater will be the increase in fruit size. At the latest, thinning should begin just after June drop, which is between 5 to 8 weeks after full bloom. Thinning should be completed at the latest by the time pit hardening begins for the cultivar. Start thinning on your earliest maturing cultivars first and progressively move to the later maturing cultivars. Remove the small or damaged fruit first, then space the remaining fruit out to about 6 to 8 inches apart.

There are several factors that can help your thinning crew determine which fruit to remove. First it is

known that fruit that develops on the outside periphery of the canopy will be larger than interior fruit. This is primarily due to the better exposure to sunlight. It is also known that fruit that is at a node where a new shoot is growing will be larger and should be retained over fruit that does not have a shoot growing from the same node.

Generally speaking, the longer the shoot the larger will be the fruit size at harvest, assuming an equal crop density. It is believed fruit size is larger because there are potentially more leaves and growth on the longer shoots to provide carbohydrates for the developing fruit. Studies in Italy have determined that carbohydrate supply to the developing fruit for the first 4 weeks after bloom come mainly from the shoots developing at the fruiting node. After 4 weeks the food supply comes from the developing terminal shoot.

Recent published research by Rich Marini at VPI was aimed at determining if pruning can reduce the amount of hand thinning labor. In a series of studies he compared the effect of heading 1 year-old shoots versus blossom thinning. Heading shoots reduced fruit set, number of fruits removed with hand thinning, and thinning time per tree. Yield, crop density, and average fruit weight were not affected by heading. Profit was increased by shoot heading in one of the three years of the study.

In conclusion, Rich stated that results from the study indicate that heading peach shoots by 50% while dormant pruning can reduce thinning costs without reducing fruit size, but a similar level of labor-intensive blossom removal may reduce post-bloom thinning costs and improve size.

Note on Timing for Assail on Apples

Source: Celeste Welty, OSU Entomologist

For growers using the new insecticide Assail for control of codling moth in apples, we had suggested during winter meetings that early timing was best for codling moth control, specifically application at 150 degree-days after moths began to fly. However, we have been alerted by the Cerexagri reps that lab research underway in Pennsylvania is showing that Assail is likely to be most effective if applied at the more conventional 250 degree-days rather than 150 degree-days. At 250 degree-days, Assail will target young larvae rather than eggs. Although Assail is toxic to eggs, only young eggs not older eggs are killed.

Degree Day Accumulations for Ohio Sites May 7, 2003

Ohio Location	Degree Day Accumulations			
	Base 45° F		Base 50° F	
	Actual	Normal	Actual	Normal
Akron/Canton	425	334	245	192
Cincinnati	613	565	395	343
Cleveland	372	313	214	181
Columbus	583	420	373	248
Dayton	537	428	338	255
Kingsville	264	258	138	146

Mansfield	397	325	224	187
Norwalk	363	297	205	170
Piketon	657	588	406	363
Toledo	337	284	180	163
Wooster	476	302	285	168
Yngstwn	365	294	202	167

Pest Phenology

Coming Event	Degree Day Accum. Base 43° F
Lesser peachtree borer 1 st catch	110 - 553
Spotted tentiform leafminer sap-feeders present	130 - 325
First codling moth catch	141 - 491
Lesser appleworm 1 st flight peak	181 - 483
San Jose scale 1 st flight peak	229 - 449

Fruit Observations & Trap Reports

Insect Key
AM: apple maggot
CM: codling moth
ESBM: eye-spotted budmoth
LAW: lesser apple worm
LPTB: lesser peachtree borer
OBLR: obliquebanded leafroller
OFM: oriental fruit moth
PTB: peachtree borer
RBLR: redbanded leafroller
SJS: San Jose scale
STLM: spotted tentiform leafminer
TABM: tufted apple budmoth
VLR: variegated leafroller

Site: Waterman Lab, Columbus
 Dr. Celeste Welty, OSU Extension Entomologist

Apple: 4/30/03 to 5/07/03
 CM: 46.3 (up from 1.7)
 LAW: 38 (up from 10)
 RBLR: 1 (up from 0)
 SJS: 1 (down from 107)

STLM: 0 (down from 15)

TABM: 4 (up from 0)

VLR: 0 (first report)

Peach: 4/30 to 5/7/03

OFM: 0 (down from 2)

LPTB: 3 (up from 0)

Site: Medina, Wayne, & Holmes Counties

Ron Becker, IPM Program Assistant

Apple: 4/30 to 5/7/03 (Petal fall)

STLM: Holmes: 83 (down from 200)

Medina: 88 (up from 1186)

Wayne: 25 (down from 147)

RBLR: Holmes: 43 (down from 88)

Medina: 18 (down from 41)

Wayne: 16 (down from 24)

CM: Holmes: 3.3 (up from 0)

Medina: 0 (same as last week)

Wayne: 1.6 (up from 0)

Peach: 4/30 to 5/7/03 (Shuck split)

LPTB: Holmes: 1 (first report)

Medina: 0 (first report)

Wayne: 0 (first report)

OFM: Holmes: 11 (up from 4)

Medina: 4 (same as last week)

Wayne: 0 (first report)

PTB: Holmes: 0 (first report)

Medina: 0 (first report)

Wayne: 0 (first report)

Insects found in apples include European red mite, rosy apple aphid, leaf rollers, and cucumber beetles! Shoot and blossom phases of fire blight were also found in one block. Slight X-disease was found on peaches. Orange rust and spider mites were found in brambles. Spittle bug, tarnished plant bug, and potato leafhopper were found in strawberries. Black raspberries are budding and strawberries vary from

bud to 20% bloom.

Site: East District: Erie & Lorain Counties
Jim Mutchler, IPM Scout

Apple: 4/29 to 5/6/03 (Full bloom)
STLM: 725 (up from 465)
OFM: 34.7 (up from 0.5)
RBLR: 69.8 (up from 31)

Beneficials found include green lacewing and native lady beetles.

Peach: 4/29 to 5/6/03 (Bloom to shuck split)
RBLR: 44.7 (up from 28)
OFM: 4.3 (up from 0)

Site: West District: Huron, Ottawa, Richland, & Sandusky Counties - Gene Horner, IPM Scout

Apple: 4/29 to 5/6/03 (Full bloom)
CM: 0 (down from 0.8)
STLM: 895 (from 105)
OFM: 16.6 (from 0)
RBLR: 80.6 (first report)

Peach: 4/29 to 5/6/03 (Bloom to petal fall)
RBLR: 62.2 (down from 125)
OFM: 5.2 (down from 85)

Biofix established April 24, 2003 for oriental fruit moth - accumulated DD (base 45) since = 153
(See last week's ICM Fruit News for OFM timing sprays.)

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