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Newsletter

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Calendar

July 8: Twilight Summer Fruit School, Lynd's Fruit Farm, western Licking County, 6:30 - 9:00 p.m. Direct marketing, cultivars, & cultural practices. Resource people will be Dick Funt and Mike Ellis. For more information contact Howard Siegrist, (740) 349-6904.

July 21 & 22: Small Fruit Tour, Wooster/Mt. Hope area. Pre-tour gathering begins Wednesday evening at Maurer Farms near Wooster. Thursday morning the group begins its self-guided, self-driven tour at Farmers' Produce Auction in Mt. Hope. Demonstrations at OARDC in Wooster round out the afternoon, and the day ends at Moreland Fruit Farm near Wooster with a walking tour, discussion, and fruit pies. $5.00 registration fee. For more information contact Mike Pullins at (614) 249-24424.

August 5: Young Grower Tour, northwest Ohio. Designed for, but not limited to, producers and their spouses age 40 and under. Watch for more info.

Managing Summer Diseases of Apple

Source: Paul Pecknold, Purdue Dept. of Plant Pathology, Facts for Fancy Fruits 99-08, June 16, 1999

Apple summer fruit rot and blemish diseases (sooty blotch & flyspeck, black rot, white rot, and bitter rot) are now on the increase. The SI fungicides (Nova, Rubigan, Procure and Bayleton) do not provide good control of these diseases. Mancozeb and Polyram are excellent for control of summer diseases; however, they can only be applied up to 77 days of harvest. After the 77 day-to-harvest restriction has passed, captan and ziram remain our best options for summer cover sprays; they should be used at the full labeled rate and on a tight schedule if cool, wet summer weather prevails. We also suggest tank mixing with Topsin-M or Benlate if it turns into a sooty blotch/fly speck year; however, Benlate and Topsin-M should be used sparingly (no more than once a month) to avoid harm to predator mites and lessen the possibility of the development of resistance.

NOTE: Benlate, and, to a lesser extent, Topsin-M are reported to cause scarf skin if used within 40 days of petal fall. Scarf skin is a physiological condition in which the fruit surface develops a milky white or grayish appearance. Scarf skin has no effect on fruit quality or storage ability, but impairs the appearance and shine on a red apple.

Infection from summer diseases, especially sooty blotch and fly speck, can be further reduced through IPM strategies that lower humidity and promote rapid drying. These include keeping grass mowed during summer and keeping trees well pruned. Tree spacing within and between rows should allow air movement between all trees. Removing adjacent woods or cutting breaks in hedgerows will also help improve airflow in the orchard. Of course it goes without saying (so I'll say it) that all the above suggestions are pretty much a waste of time if good sanitation measures are not strictly followed.

Peach Disease Update

Source: Dave Rosenberger, Plant Pathology, Cornell University, Scaffolds Volume 8, No. 14, June 21, 1999

X-Disease in Peaches

X-disease of peach trees was severe in some Hudson Valley peach orchards last year, so it is no surprise that some trees are again developing X-disease symptoms. Peach X-disease often follows a 10-15- year cycle. The disease will be very severe for 4-6 years, then will gradually disappear as a commercial problem until the next cycle begins. The reason for this cyclical pattern has never been determined. Some X-disease was noted in the Hudson Valley in 1997 and significant outbreaks occurred in 1998. We can expect the incidence of X-disease to continue increasing for several more years before it begins to subside again.

X-disease causes leaves on infected peach trees to turn yellow, curl upward, and develop red, water-soaked spots that are not limited by leaf veins. The leaf disorder results in early defoliation of the oldest leaves, leaving a "horse-tail" of young foliage at the end of affected terminal shoots. X-disease eventually causes death of the infected scaffold limbs or of the entire tree. Nitrogen deficiency and spray injury can also cause red spotting on leaves, but the symptoms on trees affected by nitrogen deficiency or spray injury usually occur uniformly throughout individual trees and sometimes throughout entire orchards. Symptoms of X-disease affect only random trees and/or branches of trees, although the incidence of X-disease may be higher in locations close to inoculum sources than in more distant parts of the orchard.

X-disease is caused by a phloem-limited mycoplasma - a minute pathogenic organism smaller than most bacteria. The X-disease mycoplasma is transmitted by at least eight species of leafhoppers found in New York. White apple leafhopper, rose leafhopper, and potato leafhoppers are not vectors. In fact, none of the X-disease vectors are abundant enough to cause direct feeding damage and they usually escape notice in the orchard. However, they are very efficient vectors of X-disease. The leafhoppers acquire the X-disease organism while feeding on diseased chokecherry bushes, on infected sweet cherry trees, or on wild seedlings of sweet cherry. They do not acquire the X-disease mycoplasma from diseased peaches because the population of the disease organism within diseased peach trees is so low that leafhoppers do not encounter the organisms while feeding.

After leafhopper vectors feed on an infected plant, the X-disease organism must grow within the insect for at least 20 days before the insect can transmit X-disease to another plant. Once that 25-day incubation period is completed, however, the leafhoppers with X-disease remain infective for the rest of their lives. In laboratory studies, leafhoppers have often lived for 30-40 days after they become infective. A single infective insect therefore has the potential to infect numerous plants.

Peach trees that become infected with X-disease are usually inoculated by leafhoppers during July and August, and symptoms then develop on the trees the following year. Leafhoppers can continue to transmit X-disease to peach trees during September and early October, but many of the late-season transmissions fail to cause disease because the pathogen does not become established in the plant following late-season transmissions. Relatively mild winters during the last two years may have allowed more of the late-season transmissions to persist through winter and may therefore have contributed to the increasing severity of X-disease.

The most effective protection against X-disease is to isolate peach plantings from all sweet cherry blocks and to regularly eradicate all chokecherries within 500 feet of peach orchards. The chokecherry species that harbors X-disease is *Prunus virginiana*, a plant that is more like a shrub than like a tree. *P. virginiana* rarely reaches more than 15 feet in height in eastern New York. It should not be confused with the wild black cherry (*Prunus serotina*), which can develop into an 80-ft. tall tree. *Prunus serotina* does not develop or harbor X-disease.

The two wild cherry species can be distinguished by the appearance of the bark, leaves, and fruit. Leaves of *P. virginiana* are more broadly oval with a hairy mid-rib on the underside of the leaf, whereas leaves of *P. serotina* are more narrow and have a smooth midrib on the underside of the leaf. Chokecherry plants infected with X-disease develop a red-yellow fall coloration during early July. With our early season this year, the distinctive color of infected chokecherries began appearing about two weeks ago along roadways in the Hudson Valley.

X-disease symptoms in sweet cherry trees are often indistinct, making it difficult to determine when a sweet cherry tree is infected. Infected trees usually produce small fruit that ripens later than healthy fruit, but this symptom is often indistinct in cherry orchards where fruit maturity is already variable because of uneven crop load. Unlike peach trees, cherry trees with X-disease can remain alive for many years after they become infected. Such infected trees become a long-term source of inoculum for other cherry trees and for peach trees. Whenever possible, peach plantings in the Hudson Valley should be kept at least 500 feet away from sweet cherry plantings.

There is no chemical means (sprays) for protecting trees from X-disease. Leafhopper control in peach orchards may reduce the spread of disease. Early maturing varieties of peaches may benefit from a postharvest insecticide spray to minimize leafhopper populations in these trees during August. However, spraying for leafhoppers is not a substitute for identifying and eradicating inoculum sources, because infective leafhoppers can enter the orchard from hedgerows and may infect trees before they are killed by insecticide residues.

Injections of terramycin can be used to treat diseased trees, but the treatment procedure is labor-intensive, must be done during September, and must be repeated annually to prevent a relapse of treated trees. Most growers consider it more cost-effective to remove

X-diseased trees and replant new trees in their place.

It is not necessary to remove X-diseased peach trees to prevent spread of the disease, because peach trees do not act as a source of inoculum for the leafhopper vectors. In young orchards, infected trees can be removed and replanted after the source of inoculum (hedgerow chokecherries or seedling sweet cherries) has been identified and removed. X-disease does not remain active in the soil.

Peach Mildews

Mildew infection on peach leaves is not very common, but several species of mildew can cause surface lesions on peach and nectarine fruit. Infections on fruit often appear as discolored spots or rings on immature fruit and as scabby areas on the surface of mature fruit. White spots or rings on immature fruit can be caused by the *Sphaerotheca pannosa*, the common mildew species found on peaches, nectarines, apricots, and roses. Rusty brown spots or rings are symptoms of the disease know as "rusty spot" and are usually caused by *Podosphaera leudotricha*, the apple mildew fungus.

Peaches vary significantly in their susceptibility to both species of mildew. Roses can supply inoculum of *S. pannosa* if mildew-susceptible peach varieties are located close to infected roses. Rusty spot can be a significant problem if susceptible peach varieties are planted adjacent to mildew-susceptible apples that will supply inoculum for infecting the peaches.

Peaches and nectarines are most susceptible to mildew infection between the shuck split and pit-hardening stages. Sulfur sprays applied during that interval usually provide adequate protection. Under New York conditions, there is little benefit to applying mildewcides after pit hardening. The symptoms on fruit at this stage cannot be eradicated, and continued spread of the disease after pit hardening is unlikely.

Correction

The electronic version of the June 24th issue of the Ohio Fruit ICM News suffered from missing hyphens in the Strawberry Bed Renovation article. Please adjust all numeric values which seem highly unusual!

Weather Note

Although some high temperature records were set this June, we don't compare to the suffering in the summer of 88. According to the National Weather Service:

"The Drought/Heat Wave of 1988 in the Central and Eastern U.S. caused $40.0 billion in damage/costs, and claimed an estimated 5,000 to 10,000 lives."

New Strawberry Fungicide

Source: Dr. Mike Ellis, Dept. Plant Pathology, Ohio State University Extension and OARDC

Elevate 50 WDG is a new fungicide that was just labeled for use on strawberry for control of Botrytis gray mold. It is brand new chemistry and is very active against Botrytis. This is good news, because we just lost Ronilan for use on strawberry, and Rovral cannot be applied past the initiation of bloom on strawberry. These (dicarboximide) fungicides were our most active fungicides against Botrytis and were important for fungicide resistance management in the benzimidazole fungicides (Benlate and Topsin).

Next year I recommend that strawberry growers replace the use of Ronilan or Rovral with Elevate. Thus, I recommend Benlate or Topsin PLUS captan or thiram ALTERNATED with Elevate PLUS captan or thiram. No more than 2 sprays of either material should be made without alternating to the other chemistry. Remember, Benlate and Topsin are considered the same chemistry (benzimidazoles). Applications need to be made during bloom in order to obtain the best control. Elevate is a product of Tomen Agro. For more information about Elevate contact Tomen Agro at (877) 448-6636, or Mike Ellis at (330) 263-3849. For information on control of Botrytis on strawberry, see Bulletin 861 Midwest Small Fruit Pest Management Handbook. http://ohioline.ag.ohio-state.edu/b861/index.html

Elevate fungicide is also registered for control of Botrytis bunch rot on grapes

Chlorine Injection for Micro-irrigation Systems

Source: Richard C. Funt, The Ohio State University and Dr. David S. Ross, University of Maryland

Chlorine can be injected into a micro-irrigation system as either a treatment or prevention of a clogging problem. Slimy bacteria grow on the interior walls of the hose and emitter. Small clay particles in the water provide nutrients to the bacteria and increase the growth and size of the slime. Chlorine is a biocide that can kill bacteria and at high rates can kill plants. Chlorine can be purchased as a powder, liquid, or gas.

When chlorine is injected into water, the pH of the water can reduce its effectiveness. For effective chlorine treatment, alkaline water should be acidified to a pH of 6.5. This must be done at two different injection ports because mixing acid to lower pH and liquid chlorine in the same tank will produce *toxic* chlorine gas. Acids and chlorine should *never* be stored together. Always add chlorine supplies to water. Chlorine injection combined with pesticides may reduce the effectiveness of the pesticides.

If chlorine is showing 0.5 to 1.0 parts per million (ppm) at the end of the line it is active in the entire system. If you have chlorine bleach at 5% active chlorine, then 2.6 fluid ounces of household bleach per 1,000 gallons yields approximately 1 ppm chlorine. Generally, the initial amount should be 5 ppm, depending on water temperature and pH for it to be 1 ppm at the end of the line. With iron usage, continuous injection may be needed to keep iron from the walls and emitter in the lines. In most cases, injection once per week or once per month may keep algae under control, but iron becomes a hard solid and may require injection every time the system is used.

Residual chlorine is easy to measure with swimming pool test kits. It is the best way for measuring chlorine in micro-irrigation. Low levels of chlorine should not harm plants or plant roots. High levels of chlorine (above 100 to 200 ppm) can cause plant injury and death.

Fruit Observations

Insect Key

AM:	Apple maggot
CM:	Codling moth
DWB:	Dogwood borer
LPTB:	Lesser peachtree borer
OBLR:	Oblique banded leafroller
OFM:	Oriental fruit moth
PC:	Plum curculio
PTB:	Peachtree borer
RBLR:	Redbanded leafroller
SJS:	San Jose scale
STLM:	Spotted tentiform leafminer
TABM:	Tufted apple budmoth
VLR:	Variegated leafroller

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

Apple: 6/23 - 6/30

RBLR: 9 (down from 26)
STLM: 434 (down from 1535)
SJS: 218 (up from 0)
CM (mean of 3 traps): 3.0 (up from 0.3)
TABM: 0 (unchanged)
VLR: 3 (up from 2)
OBLR: 0 (unchanged)

Peaches:

OFM: 12 (up from 10)
LPTB: 1 (up from 0)
PTB: 6 (up from 2)

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

Apple: 6/23 - 6/29

RBLR: 17.6 (up from 6.6)
STLM: 813 (up from 713)
SJS: 0 (unchanged)
CM: 0.8 (up from 0.2)
OBLR: 13.5 (up from 5)
VLR: 1.5 (down from 2.3)
AM: 0.1 (first report)

Peach:

OFM: 20.8 (up from 14)
RBLR: 27.8 (up from 11.3)
LPTB: 42.5 (up from 22.3)
PTB: 2.0 (up from 0)

Other pest activity: green apple aphid, wooly apple aphid, white apple leafhopper, Japanese beetle; occasional fire blight and scab.

Beneficials at work: Lacewings everywhere, orange maggot, lady beetles, predator mites.

Site: West District; Huron, Ottawa, & Sandusky Counties
*Source: Gene Horner, IPM Scou*t

Apple: 6/23 - 6/29

RBLR: 52.3 (up from 35.7)
STLM: 415 (up from 125)
SJS: 0 (unchanged)
CM: 1.2 (up from 0.3)

Peach: OFM: 3.0 (down from 14)

RBLR: 57.5 (up from 11.3)
LPTB: 10.5 (down from 22.3)
PTB: 4.5 (up from 0)

Other pest activity: Green apple aphid, white apple leafhopper, two-spotted spider mite, Japanese beetle.

Beneficials at work: Lacewings everywhere, banded thrips, orange maggot, predator mites.

Site: Wayne County
Source: Ron Becker, Program Assistant, Agriculture & IPM, OSU Extension

Apple: 6/24 - 6/30

STLM: 99 (down from 200)
CM: 0.7 (down from 0.8)
OBLR: 6.0 (up from 0)
AM: 7 (first catch, 1 orchard)

Peaches:

OFM: 17 (up from 7)
LPTB: 24 (up from 18)

Other pest activity: European red mite went over threshold in an orchard that did not use an early season miticide. Other orchards showed very light ERM and two-spotted spider mite infestations. A block of peaches was sprayed for heavy red mite last Friday.

Apple maggot traps will be going up shortly.

Ohio Apple Scab, Fire Blight, and Sooty Blotch Activity- SkyBit Products

Central District

Apple Scab:
June 21-27, 30 active but no infection
June 28, 29 possible infection & damage
Based on Forecasts; July 1-2 possible infection and damage
July 3-7 active but no infection

Fire Blight:
June 21-25, 30 not active; June 26-29 possible infection and damage
Based on Forecasts; July 1,2 4-7, possible infection and damage
July 3 not active

Sooty Blotch:
June 21-30, active but no infection
Based on Forecasts; July 1-7, active but no infection

Eastern Highlands

Apple Scab:
June 21-24, 30 active but no infection
June 25-29 possible infection & damage
Based on Forecasts; July 1,2 & 4 possible infection and damage
July 3, 5-7 active but no infection

Fire Blight:
June 21-23, 30 not active; June 24-29 possible infection and damage
Based on Forecasts; July 1,2, 4-7, possible infection and damage
July 3 active but no infection

Sooty Blotch:
June 21-30 active but no infection
Based on Forecasts; July 1-7, active but no infection

Northeast District

Apple Scab:
June 21-24, 26, 30 active but no infection
June 25, 27, 28, 29 possible infection & damage
Based on Forecasts; July 1, 2, 4 possible infection and damage
July 3, 5-7 active but no infection

Fire Blight:
June 21-23 not active; June 24-29 possible infection and damage; June 30 active but no infection
Based on Forecasts; July 1-7, possible infection and damage

Sooty Blotch:
June 21-30, active but no infection
Based on Forecasts; July 1-7, active but no infection

North Central District

Apple Scab:
June 21-26, 30 active but no infection
June 27-29 possible infection & damage
Based on Forecasts; July 1, 2, 4 possible infection and damage
July 3, 5-7 active but no infection

Fire Blight:
June 21-26, 30 not active; June 27-29 possible infection and damage
Based on Forecasts; July 1-7, possible infection and damage

Sooty Blotch:
June 21-30, active but no infection
Based on Forecasts; July 1-7, active but no infection

West District

Apple Scab:
June 21-23, 26, 30 active but no infection
June 24, 25, 27-29 possible infection & damage
Based on Forecasts; July 1, 2, 4 possible infection and damage
July 3, 5-7 active but no infection

Fire Blight:
June 21-23, 30 not active
June 24, 25, 27-29 possible infection and damage
June 26 active but no infection
Based on Forecasts; July 1, 2, 4-7, possible infection and damage
July 3 not active

Sooty Blotch:
June 21-30, active but no infection
Based on Forecasts; July 1-7, active but no infection

Degree Day Accumulations for Selected Ohio Sites January 1, 1999 to date indicated

	Actual DD Accumulations June 30, 1999		Forecasted Degree Day Accumulations July 7, 1999			
Location	**Base 43° F**	**Base 50° F**	**Base 43° F**	**Normal**	**Base 50° F**	**Normal**
Akron - Canton	1687	1059	1932	1778	1255	1130
Cincinnati	2049	1324	2308	2340	1534	1563
Cleveland	1677	1059	1923	1724	1256	1094
Columbus	2096	1401	2351	2007	1607	1308
Dayton	1934	1265	2190	2056	1471	1356
Elyria	1787	1171	2026	1830	1362	1182
Fremont	1566	985	1817	1760	1187	1139
Mansfield	1673	1051	1917	1755	1245	1113
Norwalk	1675	1067	1919	1718	1262	1098
Toledo	1724	1114	1966	1710	1306	1093
Wooster	1752	1117	1991	1677	1307	1044
Youngstown	1527	931	1761	1628	1116	1011

Phenology

	Range of Degree Day Accumulations	
Coming Events	**Base 43° F**	**Base 50° F**
Apple maggot 1st catch	1045-	629-1078

	1671	
Redbanded leafroller 2nd flight begins	1096-2029	656-1381
Codling moth 1st flight subsides	1112-2118	673-1395
Codling moth 2nd flight begins	1355-2302	864-1549
San Jose scale 2nd flight begins	1449-1995	893-1407
STLM 2nd generation tissue feeders present	1504-2086	952-1201
Apple maggot 1st oviposition (fruit punctures)	1566-2200	1001-1575
Codling moth 2nd flight peak	1587-3103	1061-2212
Apple maggot flight peak	2033-2688	1387-1804

Thanks to Scaffolds Fruit Journal (Art Agnello)

Preliminary Monthly Climatological Data for Selected Ohio Locations June 1999

Weather Station Location	Monthly Precipitation	Normal Monthly Precipitation	Year-to-Date Precipitation	Normal Year-to-Date Precipitation	Average High	Normal High	Average Low	Normal Low	Mean Temp.	Normal Mean
Akron-Canton	1.19	3.18	15.82	17.79	80.7	78.5	58.8	57.0	69.8	67.8
Cincinnati	3.16	3.84	18.33	21.39	83.6	82.0	62.4	60.0	73.0	71.0
Cleveland	1.43	3.70	14.51	17.47	80.3	78.3	59.9	56.8	70.1	67.5
Columbus	0.62	4.04	14.58	18.87	85.1	80.4	63.9	58.0	74.5	69.2
Dayton	3.70	3.82	18.72	18.88	82.1	81.7	62.8	59.2	72.5	70.5
Elyria	1.41	3.81	14.04	17.23	82.3	81.5	59.9	57.3	71.1	69.4
Fremont	2.95	3.91	15.47	17.82	81.9	80.1	56.5	58.0	69.2	69.0
Mansfield	1.66	3.95	17.42	19.24	80.4	78.2	58.5	57.2	69.5	67.7
Norwalk	3.00	3.89	16.46	16.97	77.8	78.8	57.9	56.6	67.8	67.7
Toledo	1.86	3.75	17.92	15.76	82.0	79.8	59.5	56.0	70.8	67.9
Wooster	1.03	3.47	15.49	17.38	82.8	79.5	58.5	56.6	70.6	67.5
Youngstown	2.78	3.94	19.78	17.79	79.0	77.4	55.7	54.9	67.4	66.2

Temperatures in degrees F, Precipitation in inches

Records set:*Highs - 7th, Youngstown 89° F; 8th, Mansfield 92° F; 10th, Cleveland 92° F, Mansfield 92° F, Youngstown 91° F; 11th, Mansfield 90° F.*

Lows - 18th, Cincinnati 49° F, Mansfield 44° F; 19th, Youngstown 44° F,

Table Created by Ted W. Gastier, OSU Extension from National Weather Service, OARDC & Local Data

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