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THE OHIO STATE UNIVERSITY Newsletter Extension

Fruit ICM News

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Calendar

July 10: Ohio Fruit Growers Society Summer Tour, Hirsch Fruit Farm, Chillicothe, OH. Registration for the Summer Tour begins at 8:00 a.m. Member fees are $15 per family & $10 per individual; nonmember fees are $20 & $15. Orchard tours will begin as soon as the first tour wagon is full. Registrants will be able to purchase morning refreshments and a noontime meal. As an extension of the Summer Tour, OSU's Piketon Research & Extension Center has scheduled an afternoon tour of their facilities. Beginning at 3 p.m., there will be tours of horticulture & soil & water demonstration plots, aquaculture research, and business & learning center facilities. More information about the centers at Piketon is available at http://www.ag.ohio-state.edu/~prec/. For more info about the summer tour, call Tom Sachs at 614-249-2424.

July 23: Licking County Twilight Fruit School, Branstool Orchards. Contact Howard Siegrist at 740-349-6900 for more information.

Managing Insects with Horticultural Oils

Source: Mira Danilovich, District Hort. Agent, Michigan State Fruit Crop Advisory Team Alert, June 4, 2002

Horticultural oils offer a valuable option for insect control, yet they are probably the least explored alternative. Ever since the mid 80's when I worked extensively with oils, I have been a proponent of their use. I guess they have proven to be an example for the axiom that it is better to prevent the problem than to deal with it once it is established.

What are horticultural oils?

Horticultural or "dormant" oils, as they are often referred to, are a petroleum product. They are effective in controlling pests during certain developmental stages in which pests are not vulnerable to other insecticides and miticides. Oil programs are aimed primarily at scale species, adelgids, aphids, mealybugs, mites, plant bugs (eggs and nymphs), psyllids, eggs of certain moths (fall cankerworm, webworms), leafhoppers, leafrollers (eggs and young larvae) and early instars of hairless larvae.

Oil effectiveness

In the past, various oils had different degrees of refinement. The problems associated with oil sprays are most often due to the purity of the oil and rates applied. There are several criteria that need to be considered when determining the effectiveness of oil. The unsulfonated residue (UR) of 92% and above is preferred. (This refers to the degree of refinement to remove sulfur impurities.) The higher the percentage, the more refined the oil. These highly refined oils are known as "Superior Oils." There are several trade names for them, like Sun Ultra-Fine Oil, Sunspray, Superior 70 Oil, Supreme Oil, etc.

Gravity, or density reading, refers to the weight of the oil. Paraffinic oil is less dense than aromatic hydrocarbon type.

Viscosity is the most important parameter when selecting the oil for spraying fruit trees. Viscosity is expressed in seconds and represents the time needed for the drop of oil to pass through a standard opening. This in turn relates to the length of time that the oil is exposed to effectively cover the plant before breaking down. The values for dormant oils are from 90-150 seconds. For the summer or verdant oils, the values are from 65-90. To be on the safe side, oils 65-70 seconds should be used for summer sprays.

How oils work

Superior oils work as contact insecticides and miticides. It is essential to provide excellent coverage so that the targeted pest gets in contact with the oil in order to have satisfactory control. To achieve that, a minimum of 100 gallons of water per acre is recommended. Oils are mixed with emulsifying agents that allow them to make a milky solution when added to the water. The mixture has a good tank life, usually up to several days. However, it is best to use fresh mixture and all fills should be made for what is needed for each day. Before spraying, oils in the drums should be checked for proper emulsion formulation. This could be easily tested by mixing 2% volume/volume solution of oil in 1 gallon of water, shaking well, and letting it sit for 5 minutes. If the solution turns milky, the oil is good and can be used. If the oil stays on the water surface, the emulsifier is gone and the mixture is not safe. The oil should not be used!

Pest control falls into two basic categories: interference with egg development and reducing the insect or mite population after hatching. In the first instance, the oil may prevent normal oxygen exchange

through the egg covering and hardening of the outer membrane which prevents hatching. Another possibility is the dissolving of the outer covering and oil penetrating into the egg itself, thereby causing coagulation of the protoplasm. When the oil gets in contact with the larval or adult stage of the insect or mite, it may interfere with the insect's respiratory activity by blocking the tracheal openings on their bodies or, possibly, may create imbalance in hormonal activity.

Best time to spray oil

Oil sprays are best known for their use in "dormancy," though they could be used throughout the "green" season. With dormant sprays there is a dilemma whether it is better to spray in fall or in spring. In either case there area couple of things to consider: frost potential and the problem of determining dormancy.

How can we be sure that the trees are truly dormant? Leaf drop does not necessarily mean that the trees are dormant! If mild conditions prevail in the fall, the cells in the wood and cambial layer may still be active. Spraying oil will block and seal the pores and hinder the normal gas exchange, killing off the tissue. In our northern climate it is important to have a minimum of 48 cumulative hours of below-freezing temperatures before we can safely apply oil at the dormant rates. Normally, it will take a few days with the temperatures in low twenties or in the teens to satisfy this requirement and stop any activity on the cellular level in the trees.

In spring, just a week of higher than normal temperatures will trigger the "coming-out" of dormancy. Oil applications at this time followed by mild weather are not a problem. However, if the period of above-normal temperatures is followed by a sudden drop in temperatures after the trees have been sprayed, significant tissue damage will occur.

Using oils in the "green" stage during summer is recommended for scale, aphid, and mite control. Superior oils are relatively safe, and most fruit trees will tolerate the application at summer rates. Summer oil rates do, however, depend on the overall health of the trees, temperatures, and "accompanying" materials in the spray tank.

Severely stressed plants should not be sprayed with the oil. Generally, if there is some stress involved, the rate should be cut down to 1.25 percent. Normally, it is safe to spray 70 seconds oil at 1.25 percent rate. If there is temperature above 75-80° F, the rate should be dropped from 1.25 percent to 1 percent. It is not advisable to spray oil when the temperature is above 80° F. If there is an insecticide in the spray mix, drop the oil concentration to 1 percent.

When working with oils it is important to pay attention to the pressure and agitation. Spray should be done at lower pressure (never to exceed 300PSI). Otherwise, the oils can be "driven" into the tissue, which can result in significant "burn" and potential dieback. Damage will also occur if the sprayer agitation is not working properly. Under this scenario, the oil will tend to separate and result in non-uniform concentrations on the plant.

Hot mixes

Oil is not compatible with Captan, Morestan, Sulfur or any other sulfur-containing compound. It is necessary to provide a safe interval (two weeks) between the oil application and use of any of the cited compounds. Otherwise, phytotoxicity will occur.

Summer Oil for European Red Mite

Source: Scaffolds Fruit Journal, Geneva, NY, Volume 11, No. 12, June 3, 2002

In situations where European red mite pressure or the crop's sensitivity to them hasn't necessarily justified an early season treatment with Agri-Mek, Apollo or Savey, this is the time of year when a summer oil program might be considered as an alternative preventive approach. Field research trials conducted in commercial and experimental apple orchards in western NY have shown the effectiveness of using a highly refined oil in a seasonal program to control mites throughout the summer. Some examples of these products are Sunspray Ultra Fine Spray Oil (Sun Refining & Marketing, Philadelphia), Stylet-Oil (JMS Flower Farms, Vero Beach, FL), and Omni Supreme (an ExxonMobil product formulated using Orchex 796 and distributed in our area by Helena); others are labeled and may be available, although we haven't tested all brands.

Our approach is to make three applications, on a preventive schedule, immediately after the bloom period, before mite populations have a chance to build. The first application can be any time from petal fall to 1-2 weeks later, followed by two additional sprays at 10-14-day intervals. The oil is not concentrated in the tank, but rather mixed on the basis of a rate per 100 gallons of finish spray solution; in most cases, we recommend 100 gal. per acre. A rate of 1-2 gal/100 should maintain control of most moderate populations. Don't apply without leaving at least a 10-14-day interval before or after a captan spray.

San Jose Scale

Source: Scaffolds Fruit Journal, Geneva, NY, Volume 11, No. 12, June 3, 2002

Minute SJS adult males emerge in the spring from beneath scale covers on the trees (usually during bloom) and mate. We have not yet caught any adult males in our traps this season. On average, the first catch occurs at 481 DD (base 50F). The females produce live crawlers within 4-6 weeks of mating; these make their way to new sites and insert their mouthparts into the tree, secreting a white waxy covering that eventually darkens to black. SJS infestations on the bark contribute to an overall decline in tree vigor, growth, and productivity. Fruit feeding causes distinct red-purple spots that decrease the cosmetic appeal of the fruit. Insecticidal sprays are most effective when directed against the first generation crawlers, specifically timed for the first and peak crawler activity, which are usually 7-10 days apart.

The most reliable method of determining first appearance of the crawlers in your specific area is by putting sticky-tape traps on the tree limb near encrusted areas and checking them at least twice a week, starting about the second week of June. Alternatively, a degree-day accumulation of 310 (50F base) from the date of first adult catch has also been shown to be reliable if the degree-days are known with some accuracy. In the Geneva area, first crawler emergence has tended to occur sometime around mid-June, but as we have not yet caught any adult males, or even reached the average date of first catch, as of this writing, we still have some time to wait. Lorsban used to be the standard recommended treatment for scale, and since it's no longer labeled for summer use, we're fortunate to have a new product available that is reportedly quite effective against this pest. Esteem 35WP can be applied at 4-5 oz/acre at first crawler emergence; a low rate (0.25% or 1 qt/100) of a highly refined summer oil (see above) has been shown to improve penetration and, therefore, control. The remaining OP's, such as Guthion, Imidan, Diazinon 50WP, and dimethoate, are the conventional standby choices.

FTC Gives the Green Light for Bayer to Acquire Aventis CropScience

Source: Will Smith, Senior Extension Associate, Cornell Pesticide Management Education Program

The U.S. antitrust authority, the Federal Trade Commission (FTC), approved Bayer AG's acquisition of Aventis CropScience (ACS), subject to certain conditions. Clearance had already been given by the European Commission on April 17, 2002.

"We're glad that closing, the actual transfer of the business, can now take place very soon," said Dr. Jochen Wulff, designated Management Board Chairman of Bayer CropScience. "The important thing now is to quickly and efficiently integrate the ACS operations with Bayer's crop protection business and to foster employee and customer awareness of our new corporate identity as Bayer CropScience."

The FTC's approval is conditional upon the divestment or outlicensing of a number of products marketed in the United States. The conditions regarding the insecticide fipronil are largely the same as those imposed by the E.U. Commission. The global business in fipronil for agricultural uses must be divested. Bayer may market the product for non-agricultural uses through a co-exclusive license, except in Europe. Like the European Commission, the FTC also requires that Bayer divest the insecticide acetamiprid in Europe and North America.

In addition, the wheat herbicide Everest must be divested, and Bayer's cotton defoliant Folex®, previously sold through ACS, must now be marketed by a third party. The conditions imposed by the European Commission and the FTC relate to a total sales volume of 650 to 700 million euros. Says Dr. Wulff: "These negotiated divestments will of course have an impact on our baseline, but it will be limited and will not interfere with our strategic goals for Bayer CropScience."

Effect of Rain on Fungicide Wash-Off

Source: J. W. Travis, Plant Pathologist, PennState, Fruit Times Newsletter Vol. 21, No.7

If you are using protectant fungicides you need to consider the effect of rain on wash-off of the materials. The Strobilurin (Sovran, Flint) and sterol inhibitor (Nova, Procure, Rubigan) fungicides are absorbed into the leaf and fruit tissue after application (once the residue has dried) and are not affected by rain wash-off. The protectant (Dithane, Manzate, Penncozeb, Captan, Ziram, Thiram, Polyram) fungicide residues can be affected by rain. A general rule-of-thumb for the effect of rain on washing-off protectant fungicides follows:

- Less than one inch of rain since the last spray will not significantly affect residues.
- One to two inches of rain will reduce the residue by one half. Reduce the number of days until the next spray by one half.
- Over two inches of rain since the last spray will remove most of the spray residue. Renew the fungicide deposit as soon as possible.

This rule has been used for many years to provide growers with general guidance. Newer protectant

fungicide materials may be less subject to wash-off, but information is limited.

Spray Adjuvants and Foliar Fungicides

Source: John Hartman, University of Kentucky Extension Plant Pathologist, Kentucky Fruit Facts, June 2002

Spray adjuvants are normally thought of as chemical additives, which are not pesticides, that are designed for pesticide applications primarily to enhance pest management, spray operations, or environmental safety. Adjuvants include surfactants, supplements, detergents, wetting agents, penetrants, oils, crop oils, petroleum oils, vegetable oils, phytoblands, stickers, film foamers, extenders, spreaders, spreader-stickers, deposit builders, binders, thickening agents, film makers, foams, emulsifiers, dispersants, antiflocculants, stabilizing agents, synergists, sequesterents, safeners, coupling agents, co-solvents, compatibility agents, buffering agents, humectants, antifoam agents, modifiers, and all-purpose spray adjuvants. Many of these terms are used interchangeably. For example, wetting agents and spreaders reduce surface tension of the spray on the target surface while stickers, binders, and extenders are adjuvants that allow spray residue to resist wash-off.

It is important to realize that commercial fungicide formulations often contain additives along with the active ingredient to aid in fungicide spread and retention. Some pesticides might serve as adjuvants themselves, because when tank-mixed with a fungicide, they may modify the performance of the spray. For example, when maneb or mancozeb are added to copper sprays, bacterial spot control from copper is enhanced on tomato and pepper. However, maneb or mancozeb are not considered to be adjuvants commercially because they are used primarily as fungicides.

Not all adjuvants are alike. Growers need to consult the fungicide label and the adjuvant label to determine if their fruit disease management program will be enhanced with an adjuvant. Fruit growers are increasingly using dilute horticultural oils not only late in the dormant season but also during the summer to enhance insect management efforts. Some of these oils can affect the performance of fungicides; indeed some oils are mildly fungitoxic.

Enhancement of protectant fungicides is attained primarily by utilizing those adjuvants that possess spreading (wetting) and sticking properties. The spreader helps to evenly cover as much of the leaf surface as possible with the spray and the sticker helps to maintain the spray residue on the leaf surface for periods of time. There is some uncertainty on whether or not adjuvants enhance systemic fungicide performance. Growers need to be aware that an adjuvant that increases solubility or penetration of fungicides into the plant might cause phytotocity. Thus, only use adjuvants recommended on the fungicide label.

Considerations for adjuvant use

- Many chemicals should perform well by themselves when applied under normal to ideal conditions. Spray adjuvants offer a degree of performance insurance when environmental conditions or application practices are less than ideal.
- Determine what type of adjuvant, if any, is needed by reading the relevant labels.
- For many wettable powder fungicides, spray adjuvants possessing spreading and sticking agents will enhance effectiveness to some degree when used at the prescribed rate.
- Use of adjuvants with spreading or sticking agents in conjunction with flowable fungicide

formulations does not appear to be as essential as with the wettable powder formulations. In fact, some flowable fungicide labels clearly discourage use of adjuvants, while others make general statements about adjuvants such as "Add a spreader-sticker spray adjuvant if needed" (usually with glossy-leaved crops).
- Be aware of differences in leaf texture (hairy vs smooth or old vs young) and their effects on adjuvants.
- Avoid using detergents for spreading agents. Most adjuvants sold on the market are non-ionic, whereas detergents are ionic and are likely to cause or enhance burns on the leaves or fruit. Also, non-ionic adjuvants are less likely to combine with minerals in hard water.
- With low-volume sprays, spreaders can enhance initial spray coverage. Sticking agents can enhance redistribution of the fungicide on plant tissues. Where small spray droplets are formed by a mist blower, spreader adjuvants may reduce "bounce", thereby allowing a greater amount of the fungicide to remain on the plant surface.
- Silicon-containing adjuvants should not be added to spray mixes on crops where bacterial diseases are likely to be present because they enhance ingress of bacterial cells into leaves. Growers should not expect adjuvants to perform miraculous functions.

Some examples of adjuvants (not an inclusive list):

R-11 Spreader Activator: Can be used, for example, with Abound, Benlate, Copper, Mancozeb, Rally, Povral (also has good sticking properties by itself), Topsin-M, and Ziram.

R-56 Spreader Sticker: Can be used, for example, with Abound, Benlate, Captan (avoid excessive wetting or injury may result), Mancozeb, Pally, Rovral (also has good sticking properties by itself), Topsin-M, and Ziram.

Nufilm P or 17 Pinolene Sticker: Tenacious stickers (i.e., Nufilm) usually are not the adjuvant of choice for systemic products. Milder stickers with good spreading properties (R-56) or spreader activators (R-11) would be more appropriate choices. Can be used, for example, with Copper, Mancozeb, and Ziram.

Sylgard 309 Organosilicone Spreader: Organosilicones are extremely effective spreading agents. At low rates they are very effective spreaders, while at higher rates they also act as penetrants. Low volume applications may benefit from the use of organosilicones by improving coverage. Can be used, for example, with Abound, Benlate, Captan (avoid excessive wetting or injury may result), Copper, Mancozeb, Rally, Rovral (also has good sticking properties by itself), Sulfur, and Topsin-M.

Adjuvants are not recommended with fungicides such as Bravo Weather Stick or Sulfur.

Pest Phenology

Coming Events	**Degree Day Accum. Base 50F**
San Jose scale 1st flight peak	229 - 449
Peachtree borer 1st catch	299 - 988

Obliquebanded leafroller 1st catch	392 - 681
European red mite summer egg hatch	442 - 582
STLM 2nd flight begins	449 - 880
Peachtree borer flight peaks	506 - 1494
San Jose scale 1st generation crawlers present	569-784
Oriental fruit moth 2nd flight peak	577-2066

Thanks to *Scaffolds Fruit Journal* (Art Agnello)

Degree Day Accumulations for Ohio Sites, June 5, 2002

Location	**Degree Day Accumulations Base 50F**	
	Actual	Normal
Akron-Canton	457	524
Cincinnati	737	810
Cleveland	464	496
Columbus	676	637
Dayton	646	659
Kingsville Grape	399	424
Mansfield	466	511
Norwalk	432	492
Piketon	729	817
Toledo	501	485
Wooster	512	474
Youngstown	461	460

SkyBit® Apple Scab Prediction for North-Central Ohio

Observed:
June 1-2; active, but no infection

June 3-5; possible infection & damage

Predictions based on weather forecasts:
June 6-7: possible infection & damage

June 8-15; active, but no infection

SkyBit® Fire Blight Prediction for North-Central Ohio

Observed:
June 1,2: not active
June 3, 4: active, but no infection
June 5: possible infection & damage

Predictions based on weather forecasts:
June 6-8, 14-15: active, but no infection
June 7: not active
June 9-13: possible infection & damage

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: 5/29 to 6/5/02
RBLR: 0 (same as last week)
STLM: 32 (up from 2)
CM (mean of 3 traps): 16.7 (up from 14.3)
TABM: 7
SJS: 0 (same as last week)
VLR: 4 (up from 0)

OBLR: 14 (up from 0)

Peach: 5/29 to 6/5/02
OFM: 17 (down from 31)
LPTB: 5 (up from 2)
PTB: 0 (same as last week)

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

Apple: 5/28 to 6/4/02
CM: 11.2 (up from 4.5)
STLM: 20.8 (down from 53)
SJS: 0 (same as last week)
OFM: 0.0 (same as last week)
RBLR: 0.0 (down from 0.1)

Peach: 5/28 to 6/4/02
OFM: 1.0 (up from 0.7)
RBLR: 0.3 (up from 0)
LPTP: 28.0 (down form 29.7)
PTB: 0.3 (up from 0)

Beneficials present - native lady beetles, green lacewing eggs and adults

Site: West District:Huron, Ottawa, & Sandusky Co.
Source: Gene Horner, IPM Scout

Apple: 5/28 to 6/4/02
CM: 15.4 (up from 2.7)
STLM: 6.4 (down from 10)
OFM: 12.6 (up from 3.6)
RBLR: 0.0 (same as last week)

Peach: 5/28 to 6/4/02
OFM: 3.0 (down from 6.2)
RBLR: 0.0 (same as last week)
LPTB: 10.4 (first report)
PTB: 2.0 (first report)

Beneficials present - native lady beetles, green lacewing eggs and adults, multi-colored Asian lady beetles

Note: Biofix for codling moth in North Central Ohio was May 23, 2002. Degree day accumulations since that date will equal 250 on June 9th.

Site: Wayne County
Ron Becker, IPM Program Assistant

Apple: 5/29 to 6/6/02

STLM: 0 (same as last week)
CM (mean of 3 traps): 12.2 (up from 5.3)
RBLR: 0 (down from 0.5)

Peach: 5/22 to 5/29/02
OFM: 0 (down from 0.5)
LPTB: 5 (down from 7)
PTB: 0 (same as last week)

Notes: Insect pests found this past week in apples include European red mite, white apple leafhopper, potato leafhopper, and spotted tentiform leaf miner. Numbers are very low. No fire blight spotted so far. A few fruit in peaches were starting to show powdery mildew. According to Mike Ellis, "Sulfur in the cover sprays until pit hardening should do a good job of controlling powdery mildew and be fairly economical." In a block of apples where we have a grid of 20 multipher traps, weekly counts are as high as 85 in one trap on the southern edge of the block and as low as two in a trap 100 feet into the block. Overall average of the 20 traps is 19.2.

Preliminary Monthly Climatological Data for Selected Ohio Locations, May, 2002

Weather Station Location	Monthly Precip	Normal Monthly Precip	Year-to-Date Precip	Normal Year-to-Date Precip	Avg High	Normal High	Avg Low	Normal Low	Mean Temp.	Normal Mean
Akron-Canton	5.35	3.96	19.25	15.27	66.1	69.8	43.6	47.8	54.9	58.8
Cincinnati	8.03	4.59	22.74	18.12	70.5	74.4	48.6	52.9	59.5	63.6
Cleveland	5.77	3.50	18.21	14.58	65.8	68.5	45.2	48.3	55.5	58.4
Columbus	6.61	3.88	17.67	14.75	69.4	73.3	48.1	51.8	58.7	62.5
Dayton	6.20	4.17	18.64	16.38	68.8	71.2	48.3	51.1	58.5	61.1
Fremont	4.32	3.60	14.12	12.77	65.8	70.4	42.8	48.2	54.3	59.3
Kingsville	6.33	3.30	19.88	12.70	64.4	67.0	42.6	47.1	53.5	57.1
Mansfield	4.62	4.42	17.12	16.75	66.5	69.3	44.3	46.7	55.4	58.0
Norwalk	4.75	3.55	18.36	13.08	63.6	69.4	46.6	47.0	55.1	58.3
Piketon	4.98	4.20	18.61	18.60	72.0	73.8	46.8	49.5	59.4	61.7
Toledo	3.31	3.14	14.86	12.69	67.2	70.6	45.4	48.5	56.3	59.6
Wooster	3.99	4.01	17.59	13.91	68.8	70.6	43.2	46.5	56.0	58.5
Youngstown	6.20	3.45	17.87	14.20	66.5	69.0	42.5	46.2	54.5	57.6

Temperatures in degrees F, Precipitation in inches

Record lows set:

18th Mansfield 33,
19th Akron-Canton 32, Cincinnati 30, Columbus 34, Dayton 33, Kingsville 31, Mansfield 32, Youngstown 31
20th Kingsville 29, Mansfield 35, Youngstown 29
21st Mansfield 35, Youngstown 32
22nd Cincinnati 33, Cleveland 35, Columbus 33, Kingsville 33, Mansfield 31, Piketon 32, Youngstown 30

Record lows tied:
22nd Akron-Canton 34, Toledo 33

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

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