



Newsletter

Extension

Fruit ICM News

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Calendar

June 19-20: Farm Market Tour; Pickaway, Ross, and Pike counties, sponsored by Direct Marketing Association of Ohio and Ohio State University Extension. For more information, contact John Ellerman at the Centers at Piketon (800) 297-2072.

June 30: Ohio Fruit Growers Society Summer Tour and Meeting, Patterson Fruit Farm, Chesterland. For more information, contact John Wargowsky at (614) 249-2424, or e-mail at jwargows@ofbf.org.

Erratum

Source: Scaffolds Fruit Journal, No. 9, May 14, 2001

Mike Fargione pointed out an error in the article entitled "Using Apogee to Help Manage Fire Blight" that appeared in last week's issue. In the first sentence after the numbered paragraphs that represent the decision model for using Apogee, the article as printed says:

"Now apply the formula: $y = 1 - (2+3+4+5+6)$ ".

In fact, the formula should be " $y = 1 * (2+3+4+5+6)$ " (i.e., "times" instead of "minus"). If the answer to question 1 is yes, then the numeric value is 1. If the answer is no, the numeric value is 0 and you need to go no further in your calculation.

Fine Tune Your Boom Sprayer for the Coming Season

Source: Andrew Landers, Agricultural & Biological Engineering, Ithaca, Scaffolds Fruit Journal, No. 9, May 14, 2001

Maximum economic return will be obtained with a finely tuned sprayer, as it provides better disease control and is more cost-effective. There are three factors that affect application rate:

1. Forward speed
2. Nozzle size
3. System pressure.

Forward speed affects both dose rate and volume rate - double the speed and you halve both. Remember to drive at a speed that provides a stable boom. Too fast will result in boom bounce, leading to incorrect nozzle height above the target. Too slow will result in not applying pesticides in a timely manner, failing to cover the ground and keeping on top of disease outbreaks. Nozzle selection is so important. Droplets are measured in microns; 100 microns is about the thickness of a human hair. Remember that large drops bounce; such droplets are over 300 microns and are created by using low pressures, too large a nozzle orifice and/or worn nozzles. Too fine a droplet (less than 150 microns) will drift, resulting in damage to neighboring properties, nuisance complaints, and equally important, reduced application to the target. Select the correct nozzle for the target. Use a nozzle that creates a fine spray for fungicides and insecticides. A medium quality spray is ideal for herbicides. Coarse spray is ideal for applying liquid fertilizers and pre-emergent herbicides to bare soil.

The rate of nozzle wear will depend upon the pressure used, type of pesticide being used, and nozzle material. Note that ceramic nozzle tips, while expensive, do last much, much longer than cheap plastic nozzles. Nozzles made from modern polymers are also superior to cheap plastics. Brass is the worst nozzle tip to use, as it wears out so rapidly.

Nozzle abuse is a problem caused by operators using a piece of wire to clean out a blocked tip. Rodding out a ceramic tip with a piece of wire is the kiss of death; it will damage it, thus affecting flow rate and spray pattern. Remember, good filtration and agitation will prevent nozzle blockage. If a nozzle does block, replace it with a spare and blow out the blockage with an airline or use a bristle brush; NEVER kiss nozzles!

System pressure affects flow rate, nozzle life, droplet size, fan shape, and penetration into the target. Too low a pressure will result in large droplets dripping off the target. Too high a pressure results in off-target drift and poor application. Beware that some automatic electronic controllers will alter flow rate by using a butterfly valve to change system pressure. Always work within the boundaries recommended in the sprayer manual.

Good pre-season maintenance and calibration is so important. Articles have been published by the author on this subject. They are also obtainable at: <http://aben.cals.cornell.edu/extension/pestapp/boom.html>.

Remember, good pesticide application is a wonderful blend of technology and common sense.

So you think you are a good sprayer operator?

(Answers at the end of this article.)

1. A radar type speed indicator obtains signals from
 - a) a wheel mounted induction coil.
 - b) the tractor transmission.
 - c) the field surface.
 - d) the sprayer pump drive.

2. Increasing the operating pressure of a sprayer results in
 - a) narrowing the nozzle jet angle.
 - b) decreasing droplet size.
 - c) increasing droplet size.
 - d) increasing output and droplet size.

3. Drift from a sprayer is most likely to be increased by
 - a) high operating pressures.
 - b) boom too near ground.
 - c) high application rates.
 - d) high forward speed.

4. With an automatic rate control system in operation on a sprayer, increasing forward speed causes increased output by
 - a) producing larger droplets.
 - b) increasing system pressure.
 - c) increasing droplet size and pressure.
 - d) reducing system pressure.

5. The use of 110° nozzles on a sprayer enables
 - a) the boom to be raised higher above the target
 - b) nozzles to be placed closed together.
 - c) boom to be set closer to the target.
 - d) smaller nozzle orifices to be used.

6. The correct procedure when turning on headlands during spraying is
 - a) turn off power take-off.
 - b) continue to spray.
 - c) turn sprayer main control valve to off.
 - d) turn sprayer boom valves to off.

7. When calibrating a sprayer to apply 20 gallons/acre, results show 18 gallons/acre is being applied. To rectify this error, changes should be made to
 - a) pressure.
 - b) nozzles.
 - c) speed.
 - d) speed and pressure.

8. Sprayer calibration should be carried out
 - a) by the dealer before delivering the sprayer.

- b) when poor spraying results can be seen.
- c) at the beginning of each spraying period.
- d) after at least 500 acres of spraying

Answers to Sprayer Quiz:

- 1. c 5. c
- 2. b 6. c
- 3. a 7. b
- 4. b 8. c & d

Green Fruitworms

Sources: Insect Pests of Farm, Garden, and Orchard by Davidson and Lyon, and Common Tree Fruit Pests by Argus H. Howitt

Green fruitworms are the larval stages of noctuid moths and are so named because of their habit of eating deep holes into immature fruits of apple, pear, peach, cherry, almond, and apricot trees. Injury is most frequently noticed in southern Canada and northern United States orchards, but their range of distribution is wide, and the host plants include shrubs, shade, and forest trees.

Only 3 of 10 species associated with fruit trees are considered economically important pests in the United States. They are green fruitworm, *Lithophane antennata* (Walker); speckled green fruitworm, *Orthosia hibisci* (Guenee); and pyramidal fruitworm, *Amphipyra pyramidoides* Guenee. All are various shades of green and marked with white or yellow longitudinal stripes. Fully grown larvae are nearly 5 cm long.

Young larvae feed on unfolding leaves, and it is not uncommon to find them occupying rolled leaves in much the same manner as leafrollers. Later instars feed on flower buds and blossoms which usually abort. Most fruits damaged up to and shortly after petal fall also drop prematurely. Those damaged fruit remaining at harvest exhibit deep, corky scars and indentations. This injury is indistinguishable at harvest from that caused by the overwintering larvae of the obliquebanded leafroller.

The adults resemble our common cutworm species. The overwintering stage may be the egg, pupa, or adult, depending on the species. One generation occurs per year for each species. Orchards treated with chemicals for control of other pests are not troubled by fruitworms.

Additional information (including images) can be found at:

<http://www.ento.vt.edu/Fruitfiles/GFW.html>

or

<http://www.caf.wvu.edu/kearneysville/wvufarm9.html>

Before You Light It... Know Ohio's Open Burning Regulations

Source: <http://www.epa.state.oh.us/pic/facts/openburn.html>.

When you burn trash outdoors, the potential cost to your health, your home, your neighbors, and your environment far exceeds the price of adequate collection services. Protect yourself, your neighbors, and your wallet by knowing the rules--what you can burn and where. And remember, there are alternatives to open burning.

What does Ohio EPA consider "open burning"?

You are open burning any time you light an outdoor fire. In the past, many materials--including leaves, tree trimmings, tires, and construction debris--were routinely burned outdoors.

Why do Ohio's laws prohibit so many kinds of open burning?

Depending upon the material being burned, open fires can release many kinds of toxic fumes. Leaves and plant materials send aloft millions of spores when they catch fire, causing many people with allergies to have difficulty breathing. The pollutants released by open burning also make it more difficult to attain, or maintain, health-based air quality standards, especially in or near the major metropolitan centers. The gases released by open burning can also harm neighboring buildings by corroding metal siding and damaging paint. Besides, open burning is not a very efficient way to get rid of wastes since open fires do not get hot enough to burn the materials completely.

What materials can never be burned?

Some materials may not be burned anywhere in the state at any time. These are: materials containing rubber, grease, and asphalt or made from petroleum, such as tires, cars and auto parts, plastics, or plastic-coated wire; garbage--any wastes created in the process of handling, preparing, cooking, or consumption of food; and dead animals.

Where is burning illegal?

With a few exceptions, open burning is not permitted in a restricted area. Restricted areas include:

- 1). within the boundaries of any municipal corporation;
- 2). within corporation limits and a 1,000-foot zone outside any municipal corporation having a population of 1,000 to 10,000; and
- 3). within corporation limits and a one-mile zone outside any municipal corporation with a population of more than 10,000.

What types of open burning are permitted anywhere?

A few types of open burning are permitted everywhere, even in restricted areas. Fires must be kept to a minimum size for their intended purpose, and shall not be used for waste disposal purposes. Within a restricted area, permitted burning includes:

- 1). cooking for human consumption (barbecues, campfires, cookouts);
- 2). heating tar;
- 3). welding and acetylene torches;

- 4). smudge pots and similar occupational needs; and
- 5). heating for warmth of outdoor workers and strikers.

Use common sense: use only clean wood and restrict the size of the fire so it can be contained in a 55-gallon drum.

By notifying Ohio EPA in advance, ceremonial fires can be set for limited periods of time. Fires must be limited in size to 5 feet by 5 feet and may not burn for more than three hours.

Under certain circumstances, fires set to train firefighters, to dispose of certain ignitable or explosive materials, or to dispose of poisons such as pesticides and their containers are allowed **WITH PRIOR WRITTEN PERMISSION FROM OHIO EPA.**

Recognized horticultural, silvicultural, range, or wildlife management practices involving burning also are allowed with prior written permission from Ohio EPA. This permission may take two weeks to obtain. Ohio EPA is represented by five district offices and nine local air agencies. See below for the agency to contact in your area.

Fires intended to control disease or pests may be set if the local health department, the Ohio Department of Agriculture, or the U.S. Department of Agriculture verifies to Ohio EPA that open burning is the only appropriate control methods.

What types of open burning are permitted outside a restricted area?

Outside a restricted area, the following types of wastes generated on the premises can be burned:

- 1). Agricultural wastes: material generated by crop, horticultural, or livestock production practices. This includes fence posts and scrap lumber but not buildings.
- 2). Landscape wastes: plant matter such as tree trimmings, branches, stumps, brush, weeds, leaves, grass, shrubbery, yard trimmings, and crop residues.
- 3). Land-clearing wastes: plant matter which is removed when land is cleared for residential, commercial, or industrial development. This material may be burned only under certain circumstances and **WITH PRIOR WRITTEN PERMISSION FROM OHIO EPA.**
- 4). Residential waste: wastes such as wood or paper products that are generated by one-, two-, or three-family residences. Garbage may not be open burned.

However, no open burning can take place within 1,000 feet of an inhabited building located off the property where the fire is set. Nor can the fire obscure visibility for roadways, railroad tracks, or air fields.

No wastes generated off the premises may be burned. For example, a tree-trimming contractor may not haul branches and limbs to another site to burn them. Open burning is prohibited when air pollution warnings, alerts, or emergencies are in effect.

Does Ohio EPA ever allow exceptions to the rules?

Under certain circumstances, yes. However, to burn a prohibited material or set a fire in a restricted area, **YOU MUST RECEIVE WRITTEN PERMISSION FROM OHIO EPA BEFORE YOU BEGIN BURNING.**

Can a community enact local ordinances to allow open burning?

Local ordinances cannot be less strict than the state law described in this article. They can be more strict, however.

What will happen to me if I m caught illegally open burning?

Ohio EPA has the legal authority to enforce the open burning laws. Violations can result in substantial penalties. If you have any questions, or would like to report a suspected open burning incident, contact your Ohio EPA district office or your local air pollution control agency. The accompanying list indicates the agency to call nearest your county.

For a complete copy of Ohio's open burning regulations, contact:

Division of Air Pollution Control
Ohio EPA
P.O. Box 1049
Columbus, Ohio 43216-1049
(614) 644-2270

Local Air Pollution Control Agencies

- 1). Akron Regional Air Quality (330) 375-2480
- 2). Canton Air Pollution Control Division (330) 489-3385
- 3). Air Quality Programs (513) 651-9437
- 4). Cleveland Division of Air Pollution Control (216) 664-2324
- 5). Regional Air Pollution Control Agency (937) 225-4435
- 6). Lake County Air Pollution Control (216) 350-2543
- 7). Portsmouth Air Pollution Unit (614) 353-5156
- 8). Toledo Environmental Services Division (419) 936-3015
- 9). Mahoning-Trumbull Air Pollution Control (330)744-1928

EPA District Offices

CDO-Central District Office (614) 728-3778
NEDO-Northeast District Office (216) 963-1200
NWDO-Northwest District Office (419) 352-8461
SEDO-Southeast District Office (614) 385-8501
SWDO-Southwest District Office (513) 285-6357

Phenology

Coming Events	Range of Degree Day Accumulations	
	Base 43° F	Base 50° F
Plum curculio oviposition scars present	448-670	232-348
Spotted tentiform leafminer 1 st flight subsides	489-978	270-636
Redbanded leafroller 1 st flight subsides	518-1104	255-658
Codling moth 1 st flight peak	547-1346	307-824
Peachtree borer 1 st catch	565-1557	299-988
San Jose scale 1 st flight peak	581-761	308-449

Thanks to *Scaffolds Fruit Journal* (Art Agnello)

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

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

Traps used: STLM = Wing trap, SJS = Pherocon V, Codling Moth = mean of 3 MultiPher® traps, Others = MultiPher

Apple: 5/9 to 5/16

CM: 11.7 (down from 27.3)
DWB: 0 (unchanged)
OBLR: 0 (unchanged)
OFM: 67 (up from 65)
RBLR: 0 (down from 1)
SJS: 2 (down from 72)
STLM: 1 (up from 0)
TABM: 1 (unchanged)
VLR: 1 (up from 0)

Peach: 5/9 to 5/16

LPTB: 6 (up from 3)
OFM: 66 (up from 47)

Site: East District; Erie & Lorain Counties

Source: Jim Mutchler, IPM Scout

Traps Used: STLM=wing traps, SJS=Pherocon-V, Others=MultiPher®

Apple: 5/9-5/15

CM: 10.8 (up from 0.1)
RBLR: 5.5 (down from 34.5)
SJS: 5.3 (up from 1.9)
STLM: 851 (up from 808)

Peach: 5/9 - 5/15

OFM:* 4.3 (down from 23.3)
LPTB: 1 (first report)
RBLR: 9.0 (down from 47.3)

Other pests include green peach aphid, white apple leafhopper, and European red mite.

Beneficials include predatory mites and lacewing eggs

*OFM Biofix April 30, DD (base 45) accumulated 5/16 = 276. See May 4 OFM article.

Site: West District; Huron, Ottawa, & Sandusky

Source: Gene Horner, IPM Scout

Traps Used: STLM=wing traps, SJS=Pherocon-V, PC = circle traps, Others=MultiPher® traps

Apple: 5/9 - 5/15

PC: 0 (same)

RBLR: 5.5 (down from 28.6)
SJS: 5.3 (up from 0)
STLM: 851 (up from 250)

Peach: 5/9 - 5/15

OFM:* 7.6 (down from 18.8)
RBLR: 2.3 (down from 59.8)
TPB: 0 (down from 0.3)

Other pests include white apple leafhopper, European red mite, green peach aphid, and plum curculio.

Beneficials include predatory mites and banded thrips.

*OFM Biofix April 30, DD (base 45) accumulated 5/16 = 276. See May 4 OFM article.

Putting Degree Day Calculations to Work for You

I continue to receive inquiries about calculating and using degree day calculations for timing tree fruit pest controls. Previous articles in the Ohio ICM Fruit News dated March 16, 2001 and March 31, 2000 are available on the web for your consideration. The address of the newsletter archives:

<http://www.ag.ohio-state.edu/~ipm/fruit/index.html>

A source of daily high and low temperatures for your location, or a reporting station near you, is necessary. A high-low thermometer at your orchard is one method. Downloading climatological records from a nearby reporting station is another option. Some Ohio locations available are NOAA weather stations at Akron-Canton, Cincinnati, Cleveland, Columbus, Dayton, Mansfield, Toledo, and Youngstown. The web site is: <http://iwin.nws.noaa.gov/iwin/oh/climate.html>.

Archived records for Cincinnati, Columbus, and Dayton are available at:

<http://www.nws.noaa.gov/er/iln/climate.htm>

Records for Akron-Canton, Cleveland, Mansfield, Toledo, and Youngstown can be viewed at:

<http://www.csuohio.edu/nws/climate/climate.html>

OARDC maintains a network of 12 stations which report daily climatic data. Those stations are Wooster, Jackson, OSU-Columbus, Grape Branch-Kingsville, Western Branch-South Charleston, Northwestern Branch-Hoytville, Piketon, Miami University-Oxford, Southern Branch-Ripley, Mount Vernon, Vegetable Crops Branch-Fremont, and Delaware. The web address is: <http://www.oardc.ohio-state.edu/centernet/weather.htm>.

Archived records are also available at that web site.

I recommend using a spreadsheet for recording your temperature records. With a little planning, the spreadsheet will automatically calculate and accumulate the degree days for base 45F and base 50F for you. (Remember, you are subtracting the base number [45 or 50 for our purposes] from the average temperature for each day.)

The next piece of necessary information is the Biofix date. The Biofix is defined as the date upon which

the first sustained flight of the pest under consideration is observed. Pheromone traps have been used successfully to monitor for that sustained flight We will use codling moth and San Jose scale (base 50) and Oriental fruit moth (base 45) to work through details for this growing season at the Columbus and North-Central Ohio Locations.

Pest & Event	Location and Suggested Application Dates		Recommendations for Timing Control Measures
	Columbus	North-Central Ohio	
Oriental fruit moth biofix	May 2	April 30	First generation - 150 to 200 plus 350 to 400 DD (base 45) following biofix Second generation - 1,100 to 1,150 plus 1,450 to 1,500 DD (base 45) following biofix Insecticide timings for third (and fourth) generations are still being evaluated.
1 st generation, 1 st spray	May 10	May 9	
1 st generation, 2 nd spray	May 22*	May 27*	
2 nd generation, 1 st spray	**	**	
2 nd generation, 2 nd spray	**	**	
Codling moth biofix	May 2	May 7	First generation - 250 DD (base 50) following biofix
1 st generation, 1 st spray	May 20*	May 21*	
San Jose scale biofix	May 2	May 14	First generation crawlers - 350 to 400 DD (base 50) following biofix
1 st generation crawlers	May 30*	**	

* Based on temperature forecast ** Yet to be calculated

Temperature and wind forecasts are available on the following site. (Page down to Ohio.)
http://www.cpc.ncep.noaa.gov/products/analysis_monitoring/cdus/prcp_temp_tables/mrffox.txt

Northern Ohio Apple Scab & Fire Blight Activity from SkyBit®

	Dates (Bloom = May 1, Petal Fall = May 9)	Level of Disease Activity
Observed	May 1-7, 9, 10, 13, 14	Scab active, but no infection
	May 8, 11, 12, 15, 16	Possible scab infection & damage
	May 1-7, 9, 10, 13, 14	No fire blight activity
	May 8, 15, 16	Fire blight active, but no infection

	May 11, 12	Possible fire blight infection & damage
Forecast	May 17, 18, 21-25	Possible scab infection & damage
	May 19, 20, 26	Scab active, but no infection expected
	May 17-18	Possible fire blight infection & damage
	May 19, 26	No fire blight activity
	May 20-25	Fire blight active, but no infection

Degree Day Accumulations for Selected Ohio Sites January 1, 2001 to date indicated

Location	Reported Degree Day Accumulations						Forecasted Degree Day Accumulations 5/23/01	
	May 2		May 9		May 16		Base 45° F	Base 50° F
	Base 45° F	Base 50° F	Base 45° F	Base 50° F	Base 45° F	Base 50° F		
Akron - Canton	307	197	433	288	516	338	622	408
Cincinnati	505	333	666	458	801	559	939	661
Cleveland	297	194	432	294	519	351	624	421
Columbus	454	299	607	418	724	500	845	586
Dayton	421	283	579	406	711	503	832	589
Mansfield	322	215	449	301	532	357	637	428
Norwalk	305	198	443	301	534	360	644	436
Piketon	512	333	659	445	775	526	909	625
Toledo	280	176	422	284	529	356	637	428
Wooster	331	220	463	316	550	371	657	443
Youngstown	294	188	419	278	494	321	590	383

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Information presented above and where trade names are used, they are supplied with the understanding that no discrimination is intended and no endorsement by Ohio State University Extension is implied. Although every attempt is made to produce information that is complete, timely, and accurate, the pesticide user bears responsibility of consulting the pesticide label and adhering to those directions.

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