



Newsletter

Extension

Fruit ICM News

Volume 5, No. 25
July 12, 2001

In This Issue:

[Calendar](#)

[Goodbye to John R. Holowid](#)

[Fruit Perfume Lures Female Codling Moths](#)

[Obtaining Information about Current Ohio Uniform Food Safety Code](#)

[2001 Ohio Peach Crop](#)

[2001 National Peach Crop](#)

[Black Raspberries are Tops](#)

[Assistance for Apple Growers](#)

[Japanese Beetle Control](#)

[Stark Brothers Out of Business](#)

[Fruit Observations & Trap Reports](#)

[Phenology](#)

[Northern Ohio Scab & Fire Blight Activity](#)

[Ohio Degree-Days](#)

Calendar

July 17: Twilight Fruit Field Meeting, Hugus Fruit Farm, Rushville, Ohio, Tuesday, July 17, 6:00 to 9:00 p.m. A light supper, courtesy of Rohm and Haas, will be served promptly at 6:00 p.m. Phone (740) 653-5419 for more information.

August 20, 2001: Ohio Fruit & Vegetable Young Grower Tour, beginning at Hillsboro. Includes retail, wholesale, and auction marketing operations in addition to a wagon tour of fruit and vegetable research plots. This bus tour is designed for growers 40 years of age and younger, and others are welcome if interested! Sponsors include Ohio Vegetable & Potato Growers Association, Ohio Fruit Growers Society, OSU Centers at Piketon, Groco Farms, Inc., Bayer Corporation, Farm Credit Services, and UAP Great Lakes. Capacity will be limited to one bus. Registration begins at 8:00 a.m. at the Southern State Community College just north of Hillsboro. The bus will leave at 8:30 a.m. for the first stop. Stops include:

9:30 to 11:00 a.m.: Windmill Farm Market, Springboro. Owners Jeff and Molly Wentworth and manager Teresa Moore will give us a tour of Windmill Farm Market, located in the growing and prosperous area of Springboro, south of Dayton. Their market consists of greenhouses, strawberries,

raspberries, vegetables, an animal petting area, and a spectacular Fall Festival with numerous families and school groups attending this event. Healthy food, family entertainment, and a comfortable atmosphere for children are important to Windmill Farm Market. Participants will learn valuable pointers on operating a market in an area of rapid growth and development.

11:45 a.m. to 2:30 p.m.: Groco Farms, Jamestown. Mark and Ron Guess (father and son) will give a tour of their 400-acre vegetable operation. The Guesses grow summer squash, cucumbers, bell peppers, cabbage, zucchini, and eggplant for the wholesale market. Ron and Mark have recently designed and constructed three 84 foot wide self-propelled harvestaids that have increased harvest efficiency on their bell pepper, cucumber, and squash crops. Weather permitting, participants should be able to view this machine in action as well as learn about their production practices. They will also review their produce packaging shed, where semi-loads of produce are brought into the shed and washed, graded, packed, cooled, and shipped daily by the semi-load to markets throughout the United States. Participants will also learn about their labor management practices, including the use of migrant labor. Groco Farms will provide lunch for participants.

3:30 to 5:00 p.m.: Bainbridge Produce Auction, Bainbridge. To expand agriculture production and marketing opportunities for area farmers, farm families from the Bainbridge, Ohio area built the Bainbridge Produce Auction, LLC to better serve produce sellers and buyers throughout the region. Working with Brad Bergefurd of the OSU Extension Enterprise Center in June of 1999, the Bainbridge Produce Auction facility was built by the area farmers. The Grand Opening of the Wholesale Produce Auction occurred in July 1999. Products marketed through the Bainbridge Produce Auction include locally grown bedding plants, perennials, nursery stock, cut flowers, hanging baskets, and over 100 other types of produce from apples to zucchini. Wholesale produce auctions are held every Monday, Wednesday, and Friday during the growing season, with hay, grain and straw sales held the first Friday of every month throughout the winter.

6:00 p.m. to Dark.: Hillsboro Field Night at Southern State Community College, Hillsboro. This annual event features a wagon tour and review of numerous fruit and vegetable research plots. Researchers with The OSU Centers at Piketon, The Ohio State University, and the Ohio Agricultural Research and Development Center will explain the research plots and answer grower questions about current season growing problems.

Reservations: Those wishing accommodations the night before or after the tour may consider the following hotels in Hillsboro: Days Inn (800) 665-4145, 103 Harry Sauner Rd; Paragon Inn (937) 393-4730, 883 W Main St.; or Greystone Motel (937) 393-1966, 8190 U.S. Rt. 50. Contact the Ohio Fruit and Vegetable Growers office at (614) 249-2424 or growohio@ofbf.org for more information. Complete information and registration form is available at <http://www.ofbf.org> by clicking on "Upcoming Events."

Goodbye to John R. Holowid

A friend and colleague of Ohio, Michigan, Indiana, and Kentucky fruit growers and specialists bids a farewell. He is being released as the Research and Development Representative of the former Rohm and Haas Ag Chemical Co. That company was purchased by Dow AgroSciences. Goodbye John, and thanks for your contributions to the fruit industry.

Fruit Perfume Lures Female Codling Moths

Source: *ARS News & Information*, Kathryn Barry Stelljes, Agricultural Research Service Information Staff, <http://www.ars.usda.gov/is/AR/archive/jun01/moth0601.htm> via Gary Graham, OSU Extension

The luscious aroma of ripe pears could spell doom to codling moths. Agricultural Research Service scientists have discovered that a certain chemical in pears provides just the right perfume to attract female codling moths to traps. That's a breakthrough that may revolutionize integrated pest management (IPM) in apple, pear, and walnut orchards worldwide -- and will help growers to continue providing safe food more economically.

Codling moths are the most severe and widely distributed pest of apples, pears, and walnuts in the world. The moths were accidentally introduced into the United States from Europe in the 1700's and have been a menace ever since.

Uncontrolled, the larvae -- the worm in the apple -- can destroy up to 95 percent of an apple crop and up to 60 percent of a pear crop. Feeding by larvae creates holes in walnut hulls and shells that can allow fungi to enter and infect the kernels. Some fungi produce toxins that at high levels are a food safety concern. Both federal and international regulations prohibit growers from selling toxin-contaminated nuts.

"Sex attractants called pheromones have been the main tool available to growers for monitoring codling moths in orchards," says ARS entomologist Douglas M. Light. Pheromones, which are chemicals given off by female moths to attract males for mating, have allowed scientists and growers to trap and monitor male moths in orchards.

A synthetic version of the codling moth pheromone has been available for 30 years and provides the basis for mating-disruption programs. Growers can disrupt the ability of males to find a mate by flooding the orchard canopy with pheromone. Or they can time insecticide sprays according to the number of moths found in traps baited with pheromone.

Now Light has found a new, potentially more useful tool. "We've found a natural chemical in a fruit that is as effective as pheromones in attracting moths. But more importantly, this compound not only attracts males, it lures females," Light says. He works in the USDA-ARS Plant Protection Research Unit at the Western Regional Research Center in Albany, California.

While pheromone-based programs target male moths, the real goal has always been to reduce the female's ability to reproduce. Females can lay 50 to 100 eggs, and two or three generations can hatch each growing season. Attracting females directly would allow growers to eliminate the females and their unlaidd eggs and to monitor mating cycles more precisely.

"IPM programs are based on the relationship between the time when male moths appear in pheromone traps and the time eggs begin to hatch," says ARS entomologist Alan L. Knight. To predict insect development, scientists use a measurement tool called a degree-day model. For codling moths, eggs are believed to hatch after the accumulation of 250 degree days -- which ranges from 15 to 30 calendar days after the males emerge and are detected in sex-pheromone-baited traps.

"There's a lot of potential error in estimating egg hatch based on the number of males trapped," says Knight. "We think that being able to monitor females should be a lot more accurate." In field tests, Knight verified that the pear-derived attractant is more effective than pheromones in monitoring -- and

potentially predicting -- mating and egg laying.

"In the past, growers would use long-lasting insecticides that would cover the range of possible days when moths could lay eggs and larvae could hatch," Knight says. "But as environmental regulations require use of less toxic and shorter-lived pesticides, it becomes important to know exactly when the females mate and begin their egg laying." Once the larvae hatch, there is only a short time before they crawl to and bore into the developing fruit, where they are safe from external controls.

Although apples and pears generally suffer more from codling moth attacks, Light was looking for a way to protect walnut orchards. He wondered if using one of their preferred foods -- pears -- would lure the insects away from the walnuts.

Light worked with a team of ARS chemists at the Albany laboratory to obtain 37 combinations of the chemicals that make up pear odors and flavors. Improvements in chemical detection methods over the last two decades allowed the scientists to isolate and identify the many components that make up a wide range of fruit and nut odors and flavors.

One of the mixtures showed extraordinary promise as a codling moth attractant. They discovered that the key attractant was a chemical known as the pear ester, or ethyl (2E, 4Z)-2,4-decadienoate.

To pursue the commercial potential of his discovery, Light established a cooperative research and development agreement with Trécé, Inc., of Salinas, California. Clive Henrick, vice president of research and development at Trécé, used synthetic chemistry techniques to confirm that one key chemical in pears attracted the moths.

Pear ester, they found, acts as a kairomone. Unlike a pheromone, which involves only one species, kairomones are chemicals emitted by one species (in this case pears) that attract and benefit another, such as codling moths. The moths have apparently evolved to detect this odor and use it to locate a preferred food.

"There are a lot of known kairomones, but most are worthless for commercial applications to monitor insects under field conditions," Henrick says. "This one is fantastic."

ARS and Trécé have applied for a patent on use of the pear ester for codling moth monitoring and control. Trécé also plans to include the attractant in a lure containing insecticides. This attracticide will kill moths that contact it. "This approach will use less than 10 percent of the amount of insecticide that would normally be used," Henrick says.

Researchers estimate that 90 to 95 percent of male codling moths in an orchard must be trapped or prevented from finding a mate to reduce the number of fertile eggs laid to an economically manageable level. "But for each female trapped, dozens of eggs are immediately eliminated," says Knight.

"Right now, there is no effective and economical way to determine how many females are in an orchard," says Light. "Female lures may help growers reduce pesticide use either by disrupting mating or by helping growers time their pesticide use more precisely."

Obtaining Information About Current

Ohio Uniform Food Safety Code

Source: John Wargowsky, Executive Director, Ohio Fruit & Vegetable Growers, jwargows@ofbf.org

Direct agricultural marketers being affected by this program will need to work with local health department officials. Initial communication should always be directed to the local health department. As with any new program, there will be problems that arise and need to be resolved. Consumers, academia, industry, local health department personnel, etc. are encouraged to contact the Ohio Department of Agriculture, Division of Food Safety with questions related to this new program that are not resolved locally. The following communication vehicles are available.

E-mail: foodsafety@odant.agri.state.oh.us

Phone: 1-614-728-6250

Toll-free: 1-800-282-1955 and ask receptionist or follow instructions to connect to Food Safety.

Fax: 1-614-644-0720

Current Law and Ohio Uniform Food Safety Code

<http://www.state.oh.us/agr/FoodSafetyrfsac.html>

Proposed legislation

http://www.legislature.state.oh.us/bills.cfm?ID=124_SB_136

Keeping Perspective. . .

- It is important to remember that a number of problems being experienced are due to improper application of the existing Ohio Uniform Food Safety Code. Local health departments are still learning about the program and about the nature of the food industry that has not been regulated through local health departments in the past. Ask the Ohio Department of Agriculture (see above) for help in situations that cannot be resolved locally.
- Approximately one-half of local health districts had local food establishment programs prior to the new Ohio Uniform Food Safety Code. The fees were generally less and inspection requirements may have been less stringent.
- Exempting entities from the Ohio Uniform Food Safety Code does open the door for local health districts to establish local ordinances that could regulate where the state code does not.
- Potentially hazardous foods (meat, milk, eggs, cream pies, sliced melons, sprouts, etc.) are not exempted at all in the current law, or in the proposed law, except in very limited cases. Some want farmers who direct market these products directly to the consumer to be exempt from the Ohio Uniform Food Safety Code. That would be a hard battle to win.
- Are you experiencing problems with the Ohio Uniform Food Safety Code that haven't been fixed by working through local your health districts and the Ohio Department of Agriculture? If so, contact your county Farm Bureau (if a FB member) or me directly if you are a member of the Ohio Fruit Growers Society or Ohio Vegetable and Potato Growers Association.

2001 Ohio Peach Crop

Source: Dr. Richard C. Funt, OSU Department of Horticulture and Crop Science

The National Peach Council estimates that Ohio will produce 12 million pounds of peaches in 2001. That is 17% above last year's crop and 77% above that of 1998. The reason for the increase is due to young trees planted in the mid 1990's that are now maturing and creating more leaf surface and fruit per tree.

Ohio peach growers have had several good seasons for the last five years. Frost in April has been minimal, and growers have had more fruit than before. Red Haven is also a very productive cultivar and continues to be produced by growers for Ohio customers.

New peach cultivars, such as white peaches, are being tested at Ohio State University. Recent reports show California increasing in white peach cultivars with predications that white flesh peaches and nectarines could account for 18 to 20 percent of the California crop. White flesh peaches may have 16 to 17 percent brix (soluble solids, or sugars) while yellow flesh peaches have 12 to 14 percent brix. White flesh peaches have always been available in eastern areas such as the Carolinas, but California has the major retail markets in the U.S.

Peaches have fiber and vitamin C. Health magazines place peaches in the same category as strawberries and raspberries. However, Ohio peaches picked ripe from the tree and sold immediately to customers at farm markets have exceptional flavor and juices that go everywhere. And you do not have to drive to Georgia for a Georgia belle.

2001 National Peach Crop

Source: Dr. Richard C. Funt, OSU Department of Horticulture and Crop Science

John Lott, National Peach Council President, reports that the California peach crop will be down by 11% and the nectarine crop will be down by 13%. Widespread hail in California and frost during bloom in North and South Carolina will indicate fewer shipments of peaches and nectarines. However, Pennsylvania, which is down by 1,100 acres from last year, will produce a crop larger than 2000. The Pennsylvania peach crop will be slightly higher than New Jersey's in 2001.

The California peach shipping season began on June 24 and ran through August 19 in 2000 with 986 to 1319 truck loads per week. Heavy movement at this time can decrease prices in retail stores. Retail price is generally about five times the price received by the grower. Other crops as plums and nectarines also are shipped at the same time.

With the California crop being reduced, peach growers east of the Mississippi are generally projecting more peaches in 2001 than 2000. West Virginia, Virginia, Pennsylvania, Michigan, and Ohio are looking at a full crop, and fruit is expected to be in one of the best conditions for size and flavor in the past few years.

Black Raspberries are Tops

Source: Sandy Kuhn, Ohio Berry Coordinator, via Candace Pollock, Associate Editor, OARDC Research Services

Black raspberry varieties are the number one raspberries being grown in Ohio, according to a pre-season survey by Ohio State University researchers. Fifty-seven percent of the 174 growers sampled in the survey said they grow black raspberries, followed by 26 percent who grow red raspberry spring varieties, and 14 percent who grow red raspberry fall varieties. Purple and golden raspberry varieties rounded out the survey with about three percent of the acreage. Sandy Kuhn, berry coordinator of the OSU Centers at Piketon, said the pre-season survey is the first in a series of raspberry studies being conducted this summer. The surveys are designed to determine how many acres of raspberries are being grown in Ohio, where producers grow their crop, and what markets are willing to purchase local raspberries and at what price.

"With the interest in growing and marketing berries steadily increasing in Ohio, we wanted to get a feel for what is currently being grown, yields producers are getting, and how berries are being marketed," said Kuhn. "This will give us an idea of what kinds of new and existing products growers should be targeting and where there are potential markets."

The 1997 Ohio Census of Agriculture reported 245 acres of raspberries grown on 181 farms in Ohio. Kuhn said that although those figures are helpful, the information is not entirely accurate. "Well, for one thing, that is the most recent data we have," she said. "Also, there are many farmers who grow only small acres of berries and only market them in pick-your-own operations, so they are not registered in the census."

In addition to identifying the top raspberry varieties, the pre-season survey also outlined prices producers charge customers in pick-your-own operations, on-farm markets, and community farmers markets. For example, producers who grow and sell black raspberries typically charge \$2.37/lb in pick-your-own markets, \$3.33/pint in on-farm markets, and \$3.79/pint in farmers markets. The prices in the survey were set by the producers based on what they received for their product the previous year. Kuhn said a second survey, to be conducted later in the season, will determine what producers actually receive in all three markets.

The National Agricultural Statistics Service is assisting in compiling survey data. OSU researchers have applied for a two-year, \$55,000 state-planning grant to help fund the surveys. The pre-season survey is available online at <http://www.ag.ohio-state.edu/~prec/hort/berry/price.htm>.

House Approves \$150 Million in Market Loss Assistance for Apple Growers

Source: John Wargowsky, Ohio Fruit Growers Society

The U.S. House of Representatives today approved legislation to provide the nation's apple growers with \$150 million in market loss assistance. Specifically, the \$15.7 billion House agriculture appropriations bill for fiscal 2002 (H.R. 2330) allocates \$150 million to offset a portion of the losses apple growers sustained in marketing the 2000 apple crop.

"We are extremely grateful to our allies in Congress for their steadfast support of America's apple

growers," said U.S. Apple Association (USApple) President and CEO Kraig R. Naasz, whose group worked closely with key congressional members to garner the House's approval of the apple assistance measure. "We especially appreciate their efforts to address the devastating economic hardships facing our nation's apple growers by providing this much-needed assistance."

Reps. Maurice Hinchey (D-N.Y.), John Sweeney (R-N.Y.) and James Walsh (R-N.Y.) of the House Appropriations Committee sponsored the \$150 million apple assistance amendment during that committee's consideration of the agriculture appropriations bill. House Rules Committee members Reps. Doc Hastings (R-Wash.) and Tom Reynolds (R-N.Y.) secured that committee's endorsement of the amendment, clearing the measure for today's favorable vote by the House of Representatives.

"While we're thankful to have prevailed in the House, the game is far from over," said Naasz. "We are hard at work to ensure the Senate follows suit and, hopefully, ups the ante to \$250 million." Sens. Carl Levin (D-Mich.), Olympia Snowe (R-Maine), Maria Cantwell (D-Wash.), Patty Murray (D-Wash.), Charles Schumer (D-N.Y.), and Debbie Stabenow (D-Mich.) are sponsoring similar legislation in the Senate to provide \$250 million in assistance to America's apple growers. The Senate is expected to consider its version of the fiscal 2002 agriculture spending bill before the congressional recess in August. Any differences between the House and Senate versions of the bill will have to be reconciled before the agriculture spending legislation can be sent to President George W. Bush for his signature. The fiscal 2001 agriculture appropriations act (Public Law 106-387) provided \$18.7 billion in discretionary spending, including \$138 million in direct assistance for the nation's apple growers.

Growers have suffered losses of \$1.5 billion over the past five years, including an estimated \$500 million during the past year alone, according to U.S. Department of Agriculture (USDA) statistics. Unfairly priced imports, excessive regulatory costs, stagnant domestic consumption, food retail consolidation, subsidized foreign competition, diminished exports, and global overproduction are all to blame.

Japanese Beetle Control

Source: Ohio Commercial Small Fruit and Tree Fruit Spray Guides 2001

For control of Japanese beetles on fruit, Sevin is labeled and effective, but the PHI will prevent use in situations where harvest is underway. The other materials listed below are not considered to be as effective, but do offer more flexibility for use on small fruits.

Harvest Restrictions for Japanese Beetle Insecticides

Material	Days PHI				
	Grape	Blueberry	Brambles	Apples	Peaches
Imidan	14	3	--	7	14
Malathion	3	1	1	3	7
Pyrellin	0	0	0	--	--
Pyrenone	0	0	0	--	--
Rotenone	1	1	1	--	--

Sevin	7	7	7	3	3
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Stark Bros. Out of Business

According to media reports, Foster and Gallagher, owner of several tree and seed supply companies filed for bankruptcy in early July. The company, perhaps better known by its parts (including Spring Hill Nursery, Gurney's, and Stark Brothers) has received no offers for a total buyout.

The company reportedly filed for bankruptcy protection Monday, July 2, just three days after most of the company's 3,000 employees were terminated. The privately held company listed more than \$100 million in assets and more than \$100 million in debt in their petition. The company was the owner of Breck's Bulbs, Gurney's, Henry Field's, Michigan Bulb Co., New Holland Bulb, Spring Hill Nursery, and Stark Brothers wholesale company.

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: 7/4 to 7/11

STLM: 52 (up from 27)
 RBLR: 7 (unchanged)
 CM (mean of 3 traps): 0.0 (down from 0.7)
 SJS: 22 (up from 7)
 OFM: 4 (down from 11)
 DWB: 0 (unchanged)
 TABM: 0 (unchanged)

VLR: 0 (unchanged)
OBLR: 0 (down from 1)
AM(sum of 3 traps): 1 (unchanged)

Peach: 7/4 to 7/11

OFM: 7 (down from 13)
LPTB: 1 (down from 3)
PTB: 6 (up from 2)

Site: East District; Erie & Lorain Counties

Source: Jim Mutchler, IPM Scout

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

Apple: 7/4 to 7/10

STLM: 625 (down from 875)
CM: 0.9 (down from 1.5)
SJS: 0 (unchanged)
OBLR: 1.0 (up from 0.7)

RBLR: 17 (down from 18)
AM: 0.3

Peach: 7/4 to 7/10

OFM: 2.0 (up from 0.7)
LPTB: 8.7 (down from 9.3)
PTB: 7.3 (down from 8.3)
RBLR: 17.7 (down from 49.3)

Other pests include white apple leafhopper, green apple aphid, Japanese beetle, wooly apple aphid, oriental fruit moth strike

Beneficials include: lacewings everywhere, orange maggots, white maggots, lady beetles

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: 7/4 to 7/10

CM: 1.8 (up from 0.2)
RBLR: 21.8 (down from 23.5)
SJS: 0 (unchanged)
STLM: 105 (up from 55)
PC: 0 (unchanged)
AM: 0.1 (up from 0.0)

Peach: 7/4 to 7/10

OFM: 1.8 (up from 1.0)
LPTB: 5.8 (down from 11.3)
PTB: 4.2 (up from 1.3)

RBLR: 33.2 (down from 41.0)

TPB: 0.3 (up from 0.0)

Other pests include green apple aphid, white apple leafhopper, potato leafhopper, lilac borer, apple rust mite, oak borer, Japanese beetle, oriental fruit moth flagging

Beneficials include: lacewings eggs & larvae everywhere, lady beetles, orange maggots, banded thrips, predatory mite

Phenology

Coming Events	Range of Degree Day Accumulations	
	Base 43° F	Base 50° F
Redbanded leafroller 2 nd flight begins	1096-2029	656-1381
Codling moth 1 st flight subsides	1112-2118	673-1395
Spotted tentiform leafminer 2 nd flight peak	1295-2005	824-1355
Codling moth 2 nd flight begins	1355-2302	864-1549
Obliquebanded leafroller 1 st flight subsides	1420-2452	899-1790
San Jose scale 2 nd flight begins	1449-1995	893-1407

Thanks to *Scaffolds Fruit Journal* (Art Agnello)

Northern Ohio Apple Scab, Fire Blight, & Sooty Blotch Activity from SkyBit®

	Dates	Level of Disease Activity
Observed	July 1, 4, 8	Possible scab infection & damage
	July 2, 3, 5-7, 9-11	Scab active, but no infection expected
	July 1, 3-5, 7, 8, 10	Possible fire blight infection and damage
	July 2, 6, 9, 11	No fire blight activity
	July 1-11	Possible sooty blotch infection & damage
Forecast	July 12-21	Scab active, but no infection expected
	July 12-14	No fire blight activity
	July 15	Fire blight active, but no infection
	July 16-21	Possible fire blight infection and damage

Degree Day Accumulations for Selected Ohio Sites January 1, 2001 to Date Indicated

Location	Reported Degree Day Accumulations						Forecasted Degree Day Accumulations July 18	
	June 27		July 4		July 11		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	1298	909	1463	1040	1630	1172	1801	1307
Cincinnati	1705	1252	1887	1399	2080	1557	2273	1715
Cleveland	1311	933	1484	1070	1655	1206	1818	1334
Columbus	1661	1227	1857	1387	2057	1554	2241	1703
Dayton	1587	1169	1766	1313	1955	1467	2142	1619
Mansfield	1311	926	1477	1058	1642	1183	1813	1323
Norwalk	1334	954	1586	1040	1662	1181	1829	1323
Piketon	1686	1231	1876	1386	2065	1540	2256	1696
Toledo	1354	971	1535	1116	1722	1268	1894	1406
Wooster	1359	967	1526	1099	1694	1232	1865	1368
Youngstown	1239	856	1397	979	1550	1098	1702	1215

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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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Keith L. Smith, Associate Vice President for Ag. Adm. and Director, OSU Extension.

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| [Back](#) |