http://ipm.osu.edu/fruit/index.html

THE OHIO STATE UNIVERSITY Newsletter Extension

# Fruit ICM News

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**In This Issue:**



## Calendar

**February 29: Video Conference for Plum Pox Virus Virtual Seminar,** OARDC, Wooster, 1-3:00 p.m., Fisher Conference Room - open to all.

**March 4: Southern Ohio Berry School,** OSU Centers at Piketon, 1864 Shyville Road, Piketon, Ohio, 9:00 a.m. to 4:40 p.m. Sessions for raspberry and strawberry production. Please contact Brad Bergefurd at 1-800-860-7232 for additional information.

**March 14: Update Meeting on Worker Protection Standards,** Sandusky Co. Jobs & Family Services Bldg., 2511 Countryside Drive, Fremont, Ohio, 9:00 a.m. to noon. Robert DeVany, Pesticide Control Supervisor for the Ohio Department of Agriculture, will discuss grower obligations under the WPS Act. Further details are available from the Sandusky County Extension Office at (419) 334-6340.

**March 16:** Paul Wright, Attorney at Law, will be in Northeast Ohio to explain business organizational forms (partnership, corporation, limited liability corporation, etc.) This subject applies to horticultural, farm, and non-farm businesses. See later article.

## 2000 Ohio Tree Fruit Enterprise Budgets (and Strawberry Budget)

Enterprise budgets for apples and peaches are now available on the web at http://aede.osu.edu/people/moore.301/scrops/, which offers budgets for land preparation, establishment, non-bearing, and mature trees for both apple and peach. There is also is a budget for strawberries, which includes figures for both hired picking and pick your own A special thanks for Dr. Dave Ferree, OSU Dept. of Hort & Crop Science, plus state and district farm management specialists.

Each budget is available in four formats. Choose which one best suits your needs and computer system.

- Microsoft Excel 97 and 5.0/95 is a spreadsheet file you can download to your computer and use with Microsoft Excel. Prices and quantities can be changed to fit your operation.
- Microsoft Works is a downloadable spreadsheet for Microsoft Works.
- Adobe Acrobat (.pdf) is a view only file requiring Adobe Reader software. Best for printed copies of a budget.
- HTML is a view only file, compatible with most browsers. Best viewed in Microsoft Explorer. May encounter printing problems.

Questions and comments can be sent to Robert Moore moore.301@osu.edu.

## Fire Blight of Apples

*Source: Illinois Fruit and Vegetable News, Vol. 6 No. 2, February 18, 2000*

Spring is rapidly approaching and so is the time for fighting plant diseases. Due to conducive environmental conditions, several diseases, including fire blight, scab, sooty blotch/flyspeck, rust, fruit rots (bitter rot and black rot), and powdery mildew, commonly occur in apple orchards in Illinois. Among these diseases, fire blight can be the most serious threat to apple production.

Fire blight, caused by the bacterium *Erwinia amylovora*, is a common disease of apples worldwide and is considered to be the most destructive bacterial disease affecting apple, pear, quince, and some other rosaceous plants. Losses from fire blight in apples and pears include death or severe damage to trees in the nursery and in orchards, delay of bearing fruit in young trees due to blighting of shoots and limbs, and partial loss of the crop by blighting of the blossoms and young fruits. The disease has become more threatening to apple production because of increased planting of commercially valuable but highly susceptible rootstocks and cultivars and development of streptomycin-resistant strains of the pathogen.

The pathogen infects blossoms, shoots, fruit, and rootstock. It overwinters at the margin of branch cankers initiated in the previous year. The bacteria resume growth in spring when temperatures are above 60F (16C). By the time trees are blooming, ooze containing bacteria are present on the surface of cankers, and these bacteria are spread by splashing rain or insects to open blossoms. The bacteria multiply rapidly on the blossoms and invade tissue through the nectaries. The bacteria then spread from blossom to blossom by rain or pollinating insects.

During visits to apple orchards in 1999, severe infection of fire blight was observed throughout the state. In the fall of 1999, a survey was conducted to estimate the incidence of the disease in Illinois. Twenty-six apple orchards were randomly chosen throughout the state and the incidence of the disease was evaluated in all existing cultivars in the orchards. Fire blight was found in 17 out of 26 orchards surveyed. The disease affected 4 to 50% of the trees of 14 popular apple cultivars including Cortland, Empire, Fugi, Gala, Golden Delicious, Granny Smith, Jonafree, Jonagold, Jonathan, Idared, McIntosh, Mutsu, Red Delicious, and Welthy. Many 2- and 3-year old trees were killed by the disease. Jonathan, Fugi, and Idared were the most severely affected cultivars. Severe blight was observed on M9 and M26 rootstocks. No single method is adequate to effectively control fire blight of apple. However, managing fire blight in apple orchards by using a combination of measures is entirely possible. It requires a variety of well-timed and well-executed tactics that continually aim at reducing the number and distribution of inoculum sources throughout the orchard throughout the season every year.

One of the effective approaches in managing fire blight is using weather-based disease-warning models, particularly MARYBLYT. The MARYBLYT model helps to identify potential infection periods and avoid unnecessary treatment. For effectively managing the disease, pruning cankers in winter and

removing them from the orchard is essential because this effort will remove much of the primary inoculum of the pathogen.

Application of a copper compound (Bordeaux mixture, Kocide, Copper Count-N, etc.) at silver tip is very effective to reduce colonization of bark and bud surfaces during the early pre-bloom period. Copper compounds will be most effective if applied at the recommended growth stage. Also, it is critical to apply copper to entire orchard blocks, not just to rows of susceptible varieties, because during pre-bloom period the bacteria are dispersed by insects throughout the orchard. Do not apply copper compounds after 1/4-inch green leaf stage. Fixed coppers can be mixed with oil, but copper sulfate alone should not be combined with dormant oil.

Streptomycin is an effective bactericide, if it is applied on time. This antibiotic is used only during bloom. Prediction models, such as MARYBLYT, would determine application time of streptomycin. However, if a disease-warning model is not used, the following must be seriously considered for effectiveness of streptomycin application. Streptomycin will be effective against the fire blight pathogen if it is applied before introduction of the bacteria onto the blooms. If the infection has already occurred, streptomycin will have little or no effect on controlling the pathogen (depending on the period of time between the infection and application of streptomycin). Start application of streptomycin at first sign of blooms, and repeat sprays at 4- to 5-day intervals through bloom and petal fall. If warm, wet weather occurs during bloom, it is critical that sprays be applied on a tight schedule. This antibiotic should not be applied on the trees after petal fall, unless there is a serious damage to trees by hail storm. It is recommended that the application of streptomycin in apple orchards be limited to four sprays per season.

For more information on fire blight of apples the following publications are available on the Web:

Report on Plant Disease, No. 801 from the University of Illinois:

http://www.ag.uiuc.edu/~vista/abstracts/a801.html

By Paul Steiner:

*Assessment of Fire Blight Management Options:*

http://www.caf.wvu.edu/kearneysville/articles/SteinerHort2.html

*Managing Fire Blight in High Density Systems:*

http://www.caf.wvu.edu/kearneysville/articles/SteinerHort1.html

By Alan Jones:

*Biology and Management of Fire Blight:*

http://www.msue.msu.edu/msue/imp/modc3/05219603.html

By J.F. Watkins:

*Fire Blight of Apple, Pear and Woody Ornamentals:*

http://www.ianr.unl.edu/pubs/plantdisease/g1120.htm

## Using Apogee for Control of Fire Blight Research Results

*Source: Dr. Keith Yoder, Virginia Tech University, Bill Shane, Michigan State University Fruit Crop Advisory Team Alert*

Apple and pear trees that are high in nitrogen and/or growing rapidly are highly susceptible to fire blight. The only control measure has been an antibiotic spray, streptomycin. Reducing the vigorous shoot growth in the early spring may provide a new method for control. A new plant growth regulator, prohexadione calcium, known under the trade name Apogee, is an experimental compound which reduces vigorous shoot growth, thereby helping to reduce the incidence of fire blight.

**Prohexadione-Ca (Apogee) Research Conclusions:**

- Use of a growth suppressant to reduce tree susceptibility would be a logical addition to the limited arsenal of fire blight management practices.
- Growth suppression after bloom period could provide relief in high risk situations where there is a concern about excessive use of streptomycin and development of resistance.
- Treated shoots were less susceptible than non-treated shoots in the "growing" and "growth stopping" vigor rating categories, suggesting that resistance may be due to factors other than growth cessation alone.
- The late bloom timing of P-Ca should initiate growth suppression while streptomycin is residually active from bloom applications.
- In practice, season-long effectiveness for shoot blight suppression would relate to the early setting and sustained suppression of terminal buds.
- The number of applications, rate, and timing may be determined as much by pomological and label considerations as by the ideal choice for effect on fire blight management.

K-I Chemical U.S.A. Inc. has filed a pesticide petition with the EPA dated August 24, 1999 for use on pome fruits.

The complete petition application can be read in the second part of this web site: http://www.epa.gov/fedrgstr/EPA-PEST/1999/August/Day-24/p21944.htm. (The first portion deals with Lindane.)

## Changing Ohio Tree Fruit Acreage

*Source: Research Bulletin 969, September 1964, The Codling Moth in Ohio, C.R. Cutright and the Ohio Census of Agriculture*

During the 185 years of commercial apple growing in Ohio, the areas or centers of production have changed many times. Without going into detail on this point, it may be mentioned that at the time of the Mexican War, the Cincinnati area was producing large quantities of apples. This area expanded and the lower Miami River Valley led in fruit growing and the production of nursery stock. Following the Civil War, the Chillicothe area produced many apples and this has continued in lesser degree to the present time. From 1890 to 1930 two areas would be considered co-centers of production. These were (1) southeastern and southern Ohio (Lawrence County in particular) and (2) northern Ohio (Ottawa and Sandusky Counties and the Waterville area). The areas west of Cleveland in Lorain and Erie Counties should be mentioned. Since 1910, northeastern Ohio and particularly the Columbiana and Mahoning County area, has increased production and now leads the state (1964). Climatic conditions in this area are less favorable to the codling moth than in other sections of the state.

Other areas in the state were at one time or another prominent in the production of apples. For example, Delaware County had numerous orchards but a combination of economics, fire blight, and codling moth ended significant production in this area about 1930. Jackson County has a long record of production and is still producing heavily. It is thought that the isolation of orchards in this county has aided in insect and disease control and hence in production. Washington County has experienced at least three periods of commercial apple growing. The first has already been noted at Marietta. The second was from about 1880 to 1900 and the third from 1910 to 1940. Due to industrialization and other factors, there is only minimum production today in Washington County. Urbanization in counties such as Cuyahoga, Summit, and Hamilton has virtually eliminated apple growing. It is interesting to note that the experience of individual apple growers in widely separated counties such as Ashtabula, Geauga, Jefferson, Stark, Belmont, Fairfield, Union, Greene, Darke, Van Wert, Ashland, Williams, and others show that the apple can be successfully grown in all parts of the state.

Following are the county rankings today of apples, cherries, peaches, pears, and plums. The 1997 Census of Ohio Agriculture is available from http://govinfo.library.orst.edu/php/agri/county.php?st[]=39&imgmap=agri_state

**Apples Ohio Census of Agriculture**

| | | Acres | | | Number of Farms | | |
|---|---|---|---|---|---|---|---|
| Top 20 Counties | | 1997 | 1992 | 1987 | 1997 | 1992 | 1987 |
| 1 | Columbiana | 775 | 845 | 974 | 32 | 35 | 39 |
| 2 | Licking | 652 | 760 | 544 | 29 | 28 | 24 |
| 3 | Lorain | 486 | 618 | 750 | 27 | 38 | 57 |
| 4 | Ashtabula | 485 | 485 | 661 | 47 | 52 | 56 |
| 5 | Sandusky | 479 | 515 | 499 | 13 | 20 | 20 |
| 6 | Erie | 453 | 486 | 580 | 13 | 14 | 24 |
| 7 | Mahoning | 290 | 394 | 396 | 24 | 25 | 31 |
| 8 | Medina | 285 | 309 | 357 | 41 | 49 | 50 |
| 9 | Wayne | 272 | 297 | 269 | 29 | 39 | 52 |
| 10 | Fairfield | 267 | 624 | 620 | 15 | 31 | 30 |
| 11 | Stark | 266 | 314 | 510 | 23 | 40 | 55 |
| 12 | Knox | 258 | 316 | 268 | 18 | 32 | 22 |
| 13 | Geauga | 254 | 277 | 245 | 22 | 36 | 36 |
| 14 | Lucas | 251 | 285 | 320 | 12 | 13 | 24 |
| 15 | Ottawa | 240 | 258 | 233 | 25 | 34 | 34 |
| 16 | Warren | 216 | 275 | 306 | 22 | 28 | 38 |
| 17 | Muskingum | 193 | 220 | 218 | 15 | 18 | 23 |
| 18 | Trumbull | 174 | 280 | 215 | 17 | 23 | 26 |
| 19 | Jefferson | 153 | 88 | 126 | 4 | 7 | 9 |
| 20 | Fulton | 150 | 136 | 97 | 15 | 12 | 18 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Total (State) | 9,858 | 12,669 | 14,386 | 1,126 | 1,454 | 1,614 |

**Cherries Ohio Census of Agriculture**

| | | Acres | | | Number of Farms | | |
|---|---|---|---|---|---|---|---|
| Top 20 Counties | | 1997 | 1992 | 1987 | 1997 | 1992 | 1987 |
| 1 | Washington | 10 | 5 | D | 4 | 3 | 3 |
| 2 | Licking | 7 | 6 | 12 | 6 | 5 | 6 |
| 3 | Ashtabula | 6 | 4 | D | 5 | 9 | 4 |
| 4 | Erie | 6 | D | 7 | 5 | 3 | 3 |
| 5 | Lorain | 6 | 9 | 15 | 9 | 8 | 19 |
| 6 | Knox | 3 | D | D | 3 | 3 | 4 |
| 7 | Holmes | 3 | N | 1 | 4 | N | 4 |
| 8 | Ashland | 2 | 1 | N | 4 | 4 | N |
| 9 | Medina | 2 | N | D | 7 | N | 6 |
| 10 | Pike | 2 | N | N | 3 | N | N |
| 11 | Warren | 2 | 4 | 4 | 5 | 5 | 6 |
| 12 | Athens | 1 | 2 | N | 3 | 3 | N |
| 13 | Belmont | 1 | N | N | 3 | N | N |
| 14 | Carroll | 1 | N | N | 3 | N | N |
| 15 | Clark | 1 | D | N | 3 | 4 | N |
| 16 | Fulton | 1 | N | N | 3 | N | N |
| 17 | Gallia | 1 | N | N | 6 | N | N |
| 18 | Hancock | 1 | N | N | 3 | N | N |
| 19 | Muskingum | 1 | N | N | 4 | N | N |
| 20 | Summit | 1 | 3 | N | 3 | 6 | N |
| | Total (State) | 122 | 198 | 241 | 141 | 195 | 191 |

N= not available D=ac. withheld to avoid disclosing data for individual farms

**Peaches Ohio Census of Agriculture**

| | | Acres | | | Number of Farms | | |
|---|---|---|---|---|---|---|---|
| Top 20 Counties | | 1997 | 1992 | 1987 | 1997 | 1992 | 1987 |
| 1 | Columbiana | 137 | 134 | 155 | 21 | 17 | 21 |
| 2 | Sandusky | 118 | 102 | 133 | 12 | 9 | 10 |
| 3 | Licking | 104 | 55 | D | 17 | 12 | 9 |
| 4 | Huron | 99 | D | 54 | 8 | 5 | 15 |
| 5 | Ottawa | 79 | 71 | 97 | 15 | 21 | 31 |
| 6 | Erie | 78 | 75 | 68 | 13 | 13 | 13 |
| 7 | Lake | 78 | 75 | 77 | 11 | 15 | 16 |
| 8 | Lorain | 63 | 96 | 57 | 18 | 21 | 23 |
| 9 | Stark | 54 | 59 | 48 | 10 | 22 | 21 |
| 10 | Ashtabula | 49 | 71 | 75 | 20 | 22 | 24 |
| 11 | Wayne | 49 | 45 | 37 | 18 | 29 | 28 |
| 12 | Fulton | 39 | 12 | 65 | 10 | 8 | 13 |
| 13 | Mahoning | 35 | 38 | 44 | 9 | 13 | 16 |
| 14 | Knox | 34 | 25 | 14 | 10 | 13 | 7 |
| 15 | Hamilton | 26 | 14 | 14 | 7 | 12 | 12 |
| 16 | Fairfield | 24 | 14 | 15 | 8 | 12 | 12 |
| 17 | Lucas | 24 | D | 22 | 5 | 5 | 9 |
| 18 | Medina | 19 | 11 | 8 | 19 | 13 | 10 |
| 19 | Morgan | 17 | 42 | 28 | 7 | 12 | 15 |
| 20 | Green | 16 | 10 | 12 | 6 | 16 | 12 |
| | Total (State) | 1,459 | 1,597 | 1,626 | 520 | 650 | 630 |

**Pears Ohio Census of Agriculture**

| | | Acres | | | Number of Farms | | |
|---|---|---|---|---|---|---|---|
| Top 14 Counties | | 1997 | 1992 | 1987 | 1997 | 1992 | 1987 |
| 1 | Geauga | 20 | 23 | 24 | 8 | 12 | 11 |
| 2 | Meigs | 11 | N | N | 3 | N | N |
| 3 | Lorain | 8 | 14 | 17 | 8 | 13 | 21 |
| 4 | Ashland | 6 | 9 | 6 | 8 | 6 | 6 |
| 5 | Licking | 5 | 2 | 4 | 6 | 9 | 7 |
| 6 | Butler | 3 | 3 | D | 6 | 6 | 3 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 7 | Pike | 3 | N | N | 5 | N | N |
| 8 | Delaware | 2 | 4 | 3 | 5 | 4 | 5 |
| 9 | Gallia | 2 | N | N | 4 | N | N |
| 10 | Highland | 2 | D | N | 3 | 4 | N |
| 11 | Lake | 2 | N | 2 | 3 | N | 6 |
| 12 | Ottawa | 2 | 1 | 15 | 3 | 6 | 7 |
| 13 | Summit | 2 | 1 | D | 7 | 4 | 3 |
| 14 | Warren | 2 | 2 | N | 4 | 5 | N |
| | Total (State) | 140 | 203 | 278 | 201 | 266 | 281 |

Z = less than ½ acre in county
D = acres withheld to avoid disclosing data for individual farms
N = not available

**Plums Ohio Census of Agriculture**

| | | Acres | | | Number of Farms | | |
|---|---|---|---|---|---|---|---|
| Top 20 Counties | | 1997 | 1992 | 1987 | 1997 | 1992 | 1987 |
| 1 | Sandusky | 7 | 14 | 16 | 5 | 7 | 7 |
| 2 | Carroll | 3 | N | N | 5 | N | N |
| 3 | Geauga | 3 | 5 | 4 | 5 | 7 | 7 |
| 4 | Lorain | 3 | D | D | 5 | 6 | 17 |
| 5 | Medina | 3 | 3 | 2 | 9 | 8 | 8 |
| 6 | Wayne | 3 | 6 | D | 6 | 9 | 5 |
| 7 | Ashtabula | 2 | 4 | 2 | 4 | 8 | 8 |
| 8 | Columbiana | 2 | 7 | 2 | 5 | 7 | 4 |
| 9 | Erie | 2 | 7 | 10 | 5 | 6 | 3 |
| 10 | Ashland | 1 | D | 5 | 5 | 8 | 7 |
| 11 | Clermont | 1 | N | N | 3 | N | N |
| 12 | Fulton | 1 | D | D | 3 | 3 | 3 |
| 13 | Lake | 1 | D | Z | 3 | 3 | 3 |
| 14 | Pike | 1 | N | N | 4 | N | N |
| 15 | Summit | 1 | N | N | 5 | N | N |
| 16 | Lawrence | Z | D | N | 3 | 4 | N |
| 17 | Morgan | D | 1 | 2 | 4 | 4 | 6 |
| 18 | Ottawa | D | 1 | N | 3 | 6 | N |
| 19 | Ross | Z | N | N | 3 | N | N |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 20 | Washington | D | 3 | 3 | 3 | 4 | 5 |
| | Total (State) | 71 | 102 | 136 | 133 | 183 | 189 |

*Table Created by Ted W. Gastier, OSU Extension from National Weather Service, OARDC and local data*

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