



Kentucky Fruit Facts

Research & Education Center
P.O. Box 469, Princeton, KY 42445

February 2000 (2-00)

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Fruit Facts can be found on the web at: <http://www.uky.edu/Agriculture/Horticulture/extension.htm>

Fruit Situation

Several fruit growers have inquired about this seasons bloom potential in light of the severe 1999 drought. Apples initiate flowers from mid-June to mid-July, which was before it became extremely dry in most areas. Thus, the prospects for a good crop are present with respect to bloom numbers. However, if the trees were overcropped in 1999, biennial bearing could still be a problem with varieties that are more prone to biennial bearing. The following list shows the period of flower initiation for a number of fruit crops.

Apples	Mid-Jun.-Mid-Jul.
Pears	Early Jul.-Early Aug.
Peaches	Late Jun.-Late Jul.
Prune	Late Jun.-Mid-Aug.
Sweet Cherry	Early Jul.
Tart Cherry	Mid-Jul.
Blackberry	Late Aug.
Raspberry- June bearing	Sept.-Nov.
Grape	Mid-Jun.
Gooseberry	Aug.
Currant	Jul.
Blueberry	Late Fall
Strawberry	Aug.-Sept.

We dug a few strawberry plants, cut branches from a number of non-irrigated fruit trees in the Lexington area and forced them to evaluate the bloom in January. The peach and Stanley prune plum branches bloomed and looked good. The apple flower buds are swelling and also look good. The pear buds are not swelling and may not have received enough chilling. The drought may have had its harshest effect on the strawberry crop. Most plants that we dug bloomed, however many of the plants in the field were very small. The small plant size is due to the drought and late runner plant production. Generally very small strawberry plants do not fruit well.

Tom Priddy at the U.K. Agricultural Weather Center indicates that the agricultural drought index is close to normal, which means that the soil has enough water in it so that it is adequate for cropping and farming purposes. The Palmer Drought Index, which pertains to municipal deep water supplies indicates that west and central Kentucky are in a moderate drought and east Kentucky is in a mild drought. The forecast for the next several weeks is for above normal precipitation. (Strang, Priddy)

Meetings

Feb. 14 - Strawberry Production, Pulaski County Extension Office, Somerset, KY. Contact Beth Galloway 606/679-6361.

Feb. 17 - Sustainable Agriculture Workshop, Vegetable Variety Characteristics and How to Manage Them and Greenhouse Management, Kentucky State University Farm, Frankfort, KY Contact 502/564-5871 or 5869.

Feb. 24 - Fruit Tree Pruning and Grafting Demonstrations, London, KY. Contact Glen Williams 606/864-4167.

Feb. 25 - Northern Piedmont Specialty Crops School, Ramada Inn, Jct. of I-85 and NC 96, Oxford, NC. School will cover asparagus, pumpkin and green edible soybean production. Registration \$25. Contact Carl Cantaluppi 919/603-1350.

Feb. 29 - Four County Pruning and Grafting Demonstration, Rowdy, KY (Perry County), 9:00-11:30 A.M. Contact Charles May 606/436-2044.

Mar. 2 - Shiitake Mushroom Production Workshop, Southwestern High School, Somerset, KY. Session is geared for both commercial and homeowner production, 9:00 A.M.-3:00 P.M., registration \$5.00-\$10.00, includes lunch. Participants will take home inoculated logs. Contact Beth Galloway 606/679-6361.

Mar. 7, Apple Grafting Demonstration, First Christian Church, Pineville, KY, 6:30 P.M., Contact D. J. Scully 606/337-2376.

Mar. 8, Fruit Pruning Demonstration Pineville, KY, 1:00 P.M. Contact D. J. Scully 606/337-2376.

Mar. 9. Diversify With Horticultural Crops, Hopkins county, 7:00 P.M. Contact Amy Fulcher 270/821-3650.

Mar. 14 Apple Tree Care and Pruning, Morgan County, West Liberty, KY. Contact Chris Lindon

606/743-3292.

Mar. 16 - Commercial Apple IPM Meeting, Robert Rudd's Orchard, East Bernstadt, KY (Laurel county) See article below.

Mar. 17-18 Alternative Agriculture Workshop 2000, Whitley City, KY. 25 different sessions, 6:30-8:30 P.M. Friday, 9:00 A.M.-3:00 P.M. Saturday, Contact Greg Whitis 606/376-2524.

Mar. 25 - KVS Grape Pruning Demonstration, Pilot Rock View Grapevine Nursery, Ken and Shirley Harmet, Hopkinsville, KY phone 270/269-2411. 10:00 A.M. Contact Jay Stone 270/886-6328.

Soup and bread will be served for lunch, registration fee, \$3/person. Registrations should be mailed to: Ken Harmet, 8380 Ebenezer-Ovil Road, Hopkinsville, KY 42240 by March 18, 2000.

Directions:

From north: Take Interstate 65 to Elizabethtown. At E-town take Western KY Parkway. Follow W. KY Parkway to Pennyriple Parkway. Take Pennyriple Pkwy South to Crofton (Exit 23). At Exit 23, turn left (KY800 East) to Fruit Hill, KY. At Fruit Hill, take 189 South through Fearsville, where 189 is also called Ovil Road. Go South on the Ovil Road for approx. 5 miles. Turn onto the (gravel) Ebenezer-Ovil Road. We're ½ mile south.

From the south: Take Exit 9 off the Pennyriple Parkway. Turn right onto US68. Take next left onto Lindwood. Go length of Lindwood. Turn right onto East 7th. East 7th forks. Take KY507 11 miles to Ebenezer-Ovil Rd. (at 11 mile marker). We're 2-1/2 miles north on Ebenezer-Ovil.

From the east: Take Hwy. 68 west, through outskirts of Hopkinsville, to Lindwood (just before Pennyriple Parkway/US68-80 intersection). Take KY507 11 miles to Ebenezer-Ovil Rd. (at 11 mile marker). We're 2-1/2 miles north on Ebenezer-Ovil.

From the west: Take Western Kentucky Parkway east to the Pennyriple Parkway. Take Pennyriple Pkwy South to Crofton (Exit 23). At Exit 23, turn left (KY800 East) to Fruit Hill, KY. At Fruit Hill, take 189 South through Fearsville, where 189 is also called Ovil Road. Go South on the Ovil Road for approx. 5 miles. Turn onto the (gravel) Ebenezer-Oil Road. We're ½ mile south on Ebenezer-Oil.

If you are on the Internet, Dogpile or Yahoo can direct you over back roads.

Apr. 1 - KVS Grape Pruning Demonstration, Ken and Jane Brumback's Oak Meadow Vineyard, Cynthiana, KY (45 minutes from Lexington) phone 606/234-3181. Demonstration will begin at 1:00 P.M.

Directions:

From the south: follow Paris Pike (US 27) from Lexington to Paris. Take the bypass around Paris to the left, remaining on 27. After passing the Food Lion supermarket, follow 27 to the left toward Cynthiana.

Proceed for approximately 10 miles and turn right on 982 (not left). After 1/4 mile turn left on 982. The house is about 100 yards after this turn on your right. The mail box across the street is #108. Park on the right of the driveway in front of the vineyard.

From the north: on U.S. 27 proceed through Cynthiana. Turn left on Route 982 and follow the directions above.

Apr. 18 - Commercial Apple IPM and Blackberry Production Meeting, Dana and Trudie Reed, Reed's Apple Valley Orchard, Paris KY, mkt. phone 606/987-6480 and Wayne and Cliff Shumate's Wind Stone Farms, Carlisle, KY.

Commercial Apple IPM Meeting, March 16

Rudd's Orchard, Owners Robert and Gail Rudd, 875 Hensley Rd., East Bernstadt, KY phone (606)843-6858

Directions

Take I-75 to exit 41 and exit in the east direction on to 80. Travel 1/3 mile to the intersection of 80 and US 25. Take US 25 north about 2.5 miles and veer to the right on to HWY 490. (There will be a sign here directing you to the orchard.) Follow HWY 490 for 3.8 miles and turn left on to Hensley Rd. Robert Rudd's Apple Orchard is one mile on the left.

Program EST

- 10:00 Apple Round Table Discussion led by John Schlei, President of the Kentucky State Horticultural Society.
- 11:30 Fresh Product Food Safety - Joe O'Leary
- Noon Lunch will be available at cost for those that preregister. The cost will be in the \$6.00 range. **Preregister by calling Mary Ann Kelley at 502/365-7541 between 8:00 AM and 4:30 PM CST weekdays before March 14 and give her a count for the Apple IPM meeting at Rudd's Orchard.**
- 1:00 Spraying - Jerry Brown
- 1:30 Early Season Insect Management - Ric Bessin
- 1:50 Early Season Disease Management - John Hartman
- 2:10 Orchard Nutrition - John Strang
- 2:30-3:00 Setting Up Goodnature's Micro Flash Pasteurizer - Robert Rudd and an Agricultural Engineer

Questions? Contact Jerry Brown 502/365-7541 Ext. 204 or John Strang 606/257-5685.

All UK Cooperative Extension Service Meetings are open to everyone.

An Apple A Day....

According to Barbara Butland and researchers at St George's Hospital Medical School in London, individuals that consume at least five apples or more a week enjoy improved breathing and lung functions. Researchers noted in the journal *Thorax* that apples contain high levels of quercetin, an antioxidant flavonoid. This compound may help protect the lungs from pollution and cigarette smoke. Tea, red wine and onions also contain quercetin. (Strang)

How Will Fruit Crop Diseases Respond to The Drought of 1999?

Drought effects on diseases of perennial plants can be very dramatic. In the case of fruit crops, the drought has not only affected the pathogen but also the physiology of the host from one year to the next. Host plant condition affects its reaction to disease.

Most of us are familiar with wilting and leaf scorch symptoms associated with dry weather. This past year, leaves of drought-stressed plants closed their stomata which reduced their rate of photosynthesis. Reduction in photosynthesis may not kill a tree or shrub, but it means fewer carbohydrates are made and stored for future use. New plantings were at greatest risk, because they lacked extensive root systems.

With drought, there are some fungal diseases that often do not show symptoms until the following season, after the drought has passed. The role of water stress in encouraging opportunistic plant pathogens is unclear. It is possible that the stress condition interferes with the plant's defense against such pathogens, or possibly, the reduced carbohydrate reserves allows the plant little energy to fight invasion by pathogens.

Expect certain fungi such as *Armillaria*, which attacks many woody plants, to appear in 2000 because of the 1999 drought stress. In addition expect symptoms of diseases caused by other fungi such as *Cytospora* or *Valsa*, causes of cankers on prunus; and *Botryosphaeria* and *Nectria* cause of cankers of many woody plants such as rhododendrons, apples, dogwoods, maples, and others to appear the season following the dry weather.

In searching for water, some fruit crops could have sacrificed surface roots to the drought while relying more heavily on roots that were deeper in the soil. When the excessive rains return, partial flooding could render these

deeper roots more prone to root rot diseases, thus leaving the plants with few functional roots. Thus, expect additional plant death when the drought breaks.

One possible benefit of the drought could be the reduction in foliar diseases in the year 2000. There should be less carry-over inoculum from anthracnose diseases, apple scab, cherry leaf spot and powdery mildew, for example. The benefit could be short-lived, however if spring weather is wet and rapidly repeating cycles of these diseases occur. Looking ahead even farther, the rust infections of cedar that should have occurred, but didn't, during the dry 1999 summer might result in fewer cedar galls in the spring of 2001 and less rust on apples that same summer.

Blueberries and brambles are especially susceptible to fungal cankers, and grapes also can become cankered. Reduced fruit and foliar diseases such as grape black rot could also be expected for these crops, at first. Strawberries that were not watered probably died last summer from lack of water or from the black root rot complex which is usually more severe on drought-stressed crops. On the other hand, if they did survive, this season could bring a reduced threat from leaf spot and anthracnose diseases, at least at first. (Hartman)

Obtaining Weather Data for Orchard IPM

A significant feature of the Kentucky apple IPM program has been the acquisition and use of weather and microclimate information for orchard disease and insect management. Over the years we have demonstrated the importance and uses of instruments ranging from maximum-minimum thermometers and rain gauges to microcomputer-based orchard weather monitors. It is important for growers to know the weather because many disease and insect life cycles are tied to temperature (degree days), humidity, rainfall, and leaf wetness. In addition, weather affects orchard management practices such as spraying.

An on-site weather station is excellent for learning about the weather that has occurred in the orchard, but growers also need weather forecasts. There are now available good and cost-effective options for monitoring orchard weather. For forecasts, however, growers also need access to other weather information sources. What follows is a review of weather monitoring options for fruit growers.

Traditional weather forecasts and current conditions available to the public. Most of us

are used to learning about the weather through the newspaper, radio, recorded messages, and television. Unfortunately, these reports are quite variable and may not necessarily apply to your orchard. Nevertheless, most of us rely on reports that are familiar and reasonably reliable over the years. If cable or a satellite dish are available, The Weather Channel is the most frequently updated, and arguably the most accurate source of current conditions and forecasts.

Weather radio. The National Weather Service (NWS) broadcasts frequently updated weather information that can only be received via the special Weather Radio broadcast band. These originate from National Weather Service offices in Kentucky and nearby states and throughout the United States. Weather Radio is broadcast at a frequency of 162,400 or 162,550 Mhz. Growers need to invest in a special weather radio to receive it. Weather Radio has the added benefit of audible warnings/alerts when severe weather is imminent.

The internet. The internet has become a good resource for up-to-date weather information. Numerous world wide web sites feature weather information and some are listed here. Although these sites may be able to provide hourly temperature, relative humidity, and rainfall data, none provide leaf wetness information.

- The University of Kentucky Agricultural Weather page (www.agwx.ca.uky.edu). The U.K. Agricultural Weather page can be set to provide specific information by county. This site has won awards for excellence.
- The Weather Channel (www.weather.com).
- Accuweather (www.accuweather.com).
- National Weather Service (www.nws.noaa.gov).

A note about internet sites: In the next sections, some internet sites are listed as a way for fruit growers to get more information about weather monitoring equipment or services. Just because you don't have a computer, or subscribe to an internet site, doesn't mean that you will be unable to look up this information. All County Cooperative Extension Offices in Kentucky have access to the internet. If you really need to get information about weather monitoring equipment or services to assist you in your fruit growing operation, our County Extension Agents will be more than happy to help you look up these internet resources.

Commercial services providing weather information.

- A commercial weather service we have

tried in Kentucky is SkyBit, P.O. Box 10, Boalsburg, PA 16827-0010, (tel. 800/454-2266), (www.skybit.com). SkyBit offers detailed (hourly) and site-specific (down to one meter square, based on latitude/longitude and elevation) weather observations and forecasts. SkyBit also takes basic weather data and customizes it so it is more useful to clients such as fruit growers, including spraying tips and apple disease and insect predictions. SkyBit has a monthly subscription fee, and they also offer a free trial period. Their products can be delivered via fax or e-mail.

- Another commercial weather service growers may be familiar with is the Data Transmission Network (DTN), (www.dtn.com). They offer frequently updated satellite weather images and forecasts, as well as commodity information, for a monthly or annual fee.
- Accuweather (www.accuweather.com) also can, for a subscription fee, customize weather observations and forecasts for a location specified by zip code. A thirty-day free trial subscription is available.

On-site weather stations. In the past, many growers have been reluctant to purchase orchard-based weather stations because they were expensive and difficult to calibrate and maintain. Now, however, there are some less expensive and accurate weather monitoring stations available. Often they are paired with a personal computer application that helps to visualize the collected weather data and use it for pest and disease models that aid in decision-making.

Although an inexpensive maximum-minimum thermometer and a rain gauge will work well for fire blight management programs, most other disease predictive programs rely on leaf wetness measurements. In looking for weather monitors, growers will need instruments that measure temperature, leaf wetness, relative humidity, and rainfall. Growers will also need to have access to computer programs that can make predictions based on these weather data.

The following are some examples of orchard-based weather monitoring instruments and predictive programs that fruit growers might find useful. Addresses, telephone numbers, and internet addresses are included. This is not necessarily a complete list and there is no attempt to discriminate between weather monitoring systems, but it does provide an idea of what is available.

- Spectrum Technologies, 23839 W. Andrew Rd., Plainfield, IL 60544 (tel. 800/248-8873), (www.specmeters.com) sells a small weather station that records temperature, relative humidity, leaf wetness, and rainfall. Coupled with a laptop computer and the appropriate software, weather data can be graphed, and scab or fire blight infection or other models can be run. Weather information is stored in a small electronic box called a data logger. The data logger is periodically detached and connected to a computer in the office, or a portable computer is connected to the data logger in the orchard. However, one could run a cable (a few hundred feet) from the data logger to the computer. We used this unit in our disease management experiments last summer and it appeared to work well.
- In our 1999 apple IPM program, we demonstrated the Show-Me Plant Disease Forecasting System. This unit measures temperature, leaf wetness, humidity and rainfall in the orchard and sends the information by radio to a computer located in the office. This unit can be equipped with many different disease forecasting systems from fruit diseases to tomato or turfgrass diseases. Information on the Show-Me is available at: Electronic Instrument Lab, 17 Physics Bldg., University of Missouri, Columbia, MO 65211, (tel. 314/882-4024). It can alternatively be directly wired to the computer, up to 1000 ft. As in all directly wired instrument applications, lightning protection must be considered.
- Davis Instruments (www.davisnet.com) is another producer of moderately priced agricultural weather stations that are reliable, and simple to set-up and use. Their weather equipment also interfaces with a computer application that allows easy manipulation and graphical viewing of collected weather data. The Davis weather monitors are available from Gemplers, P.O. Box 270, Belleville, WI 53508, (tel. 800/382-8473), (www.gemplers.com).
- In the past, we have demonstrated the METOS disease predictor at our U.K. experimental orchard in Princeton. This stand-alone unit has the microcomputer built into the weather monitor. A small printer provides the grower with needed information each time the unit is visited in the orchard. It is available from: METOS

Instruments, Dale Hardin, 5100-318 S Cleveland Ave, #385, Fort Meyers FL 33907, (tel. 941/277-1984, fax 941/277-1986), e-mail: (aiti@gate.net).

- The Sensor Instruments, Co., Inc., 41 Terrill Park Drive, Concord, NH 03301, (tel. 800/633-1033) sells a field monitor weather data logger that detects and records weather information for orchard and field applications.

These are but a few examples. Although we cannot change the weather, we can certainly become better informed about how the weather affects disease and insect problems in the orchard. Without good weather data, an IPM approach to managing diseases and insects in the orchard becomes difficult. Growers need to be able to know the best time to apply control measures, hence, weather monitoring is useful in practicing good IPM. (Hartman)

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New subscription requests and requests to unsubscribe should be addressed as follows.

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John Strang, Extension Horticulturist