



Kentucky Fruit Facts

Research & Education Center

P.O. Box 469, Princeton, KY 42445

July 1999 (7-99)

Prepared by John Strang, and Jerry Brown, Extension Horticulturists; Ric Bessin, Extension Entomologist; John Hartman, Extension Plant Pathologist; John Strang, Editor, Marilyn Hooks and Elizabeth Griffin, Secretaries

Our web site is: <http://www.uky.edu/Agriculture/HLA/extension.htm>

Fruit Situation

Our apple crop generally looks good across the state. There are a few varieties like Fuji that growers report a light crop on. The rains in late June came at just the right time for most of the state and fruit are sizing well.

Indiana reports that their apple crop is somewhat variable and slightly down from last year due to biennial bearing. Ohio has a good apple crop. Southwest Michigan is expecting a good apple crop, although fruit set is light on some early blooming cultivars such as Empire due to a pre-bloom frost. Pennsylvania is expecting a normal crop.

Apple growers should begin spraying for sooty blotch and fly speck diseases. Growers that have noted scale on their fruit from the first generation of San Jose Scale should have scale pheromone traps and/or black electrical tape in place to monitor for scale by now in preparation for the second generation. The black electrical tape should be wrapped around limbs in trees that are known to have scale with the sticky side out to monitor scale crawlers. Japanese beetles are out in force, particularly in western Kentucky areas.

July is the time for taking foliar analysis samples for most fruit crops. Sampling kits can be obtained through local county extension offices. (Strang, Bessin, Hartman)

Meetings

Jul. 14-16 - Practical Management of Oak and Wine, Forest to Glass - American Society for Enology and Viticulture, Eastern Section, Airport Marriott, St. Louis, Missouri. Registration \$185. Contact Ellen Harkness, Dept Food Science Purdue University, phone 765/494-6704, e-mail harkness@foodsci.purdue.edu

Jul. 15 - Sustainable Agriculture Workshop, Kentucky State University Farm, 1525 Mills Lane, Frankfort, KY. Topics: Herbs, Woodland Crops and Woodland Management. Contact 502/564-5871 or 5869.

Jul. 17 - Kentucky Vineyard Society's Summer Vineyard meeting, Bravard Vineyards and Winery, 15000 Overton Rd., Hopkinsville, KY. Contact Jim Bravard 502/269-2583.

Jul. 20 - HACCP Training for Kentucky Apple Cider Producers, Owensborro, KY. Contact Mary Ann Kelley at 270/365-7541 ex. 216. See program below.

Jul. 21 - Carroll County Field Day. Developing Your Own Market for Strawberries, Grapes, Blueberries and Shittaki Mushrooms, and Subscription Farming The field day will be held at M. G. Long's vineyard from 9:00 AM to 1:30 PM EDST. Contact Tim Hendrick 502/732-7030.

Jul. 22 - UK Robinson Experiment Station & Robinson Forest Field Day, Quicksand, KY. Contact Terry Jones 606/666-2438, e-mail tjones@ca.uky.edu

Jul. 27 - Southern Ohio Vineyard and Winery Tour, Sponsored by Ohio State University, grape growers and winemakers in Southern Ohio. The tour starts at 2:00 PM EDST at Painter Fork Vineyard, Bethel, OH and proceeds to Kinkead Ridge Vineyard in Ripley OH and ends at Moyer's Vineyard, Winery and Restaurant in Manchester, OH. The cost for dinner is based on your menu selection. Reservations are required by Wednesday, July 21 at Moyers Restaurant, phone 937/549-2957. For more information contact Maurus Brown 330/263-3681.

August 11 - U.K. South Farm Twilight Fruit and Vegetable Tour, Lexington, KY. The U.K. South Farm is located on the corner of Man O'War and Nicholasville on the south side of town. Entrance to the farm is off of Man O'War Blvd. The tour begins at 6:00 PM EDST and will feature apple cultivars, plasticulture strawberry production research, tomato, cabbage, seedless watermelon, green fleshed melon and powdery mildew tolerant pumpkin cultivar trials. Contact Brent Rowell 606/257-3374.

Oct. 16 - Kentucky Vineyard Society's Annual meeting, Maker's Mark Conference Center, Loretto, KY. Contact Mitchell Wagner phone: 502/459-6958, Fax: 502/459-2026, Email: MITCH@KORT.COM

Jan. 3-4, 2000 - KSHS/KVGA Annual Meeting and Trade Show, Holiday Inn North, Lexington, KY

Horticultural Opportunity, HAACP Program for Cider Producers

Tuesday, July 20, 1999

Daviess County Extension Office & Reid's Orchard

Registration fee includes training materials & breaks - \$5.00

The University of Kentucky, Cooperative Extension Service, Kentucky Department of Public Safety, and possibly, the FDA will present a HAACP program for producers of both treated and untreated cider. The time is July 20, 1999, 9 a.m. CDT starting at the Daviess County Extension Office and completing at Billy Reid's Orchard. Please note in the attached schedule that there is time for individual consultation with these professionals who are cooperating to help you bring safe healthful products to Kentucky consumers.

You are encouraged to bring a flow chart of your cider processing facility (see sample below). Also, bring examples of how the production of safe, high-quality cider is documented, i.e., temperature/storage time, etc.

If you have questions, call Jerry Brown, 270/365-7541, ext. 204. Those wishing to pre-register should call Mary Ann Kelley, 270/365-7541, ext. 216 or e-mail, mkelley@ca.uky.edu.

All times CDT

Moderator — Jerry Brown

- 9:00 Statement of the problem sources of contamination — **FDA**
- 9:30 Apples through Harvest, GAP's's & GMPs — **John Draper & Guy Delius**
- 10:00 Break
- 10:20 HAACP for Cider Processing — **Joe O'Leary**
- 10:50 Investigation of a Complaint — **John Draper & Guy Delius**
- 11:05 Documentation - **John Draper & Guy Delius**
- 11:35 Labeling - **John Draper & Guy Delius**
- 11:50 Lunch on your own - tables will be reserved at the Moonlite Barbeque
- Moderator - John Strang**
- 1:15- Tour of Reid's Cider House
- 2:15 Questions & Answers - **John Draper, Billy Reid & Guy Delius**
- 2:15 Individual consulting - attendees can choose between:
Regulation Sanitation - **John Draper & Guy Delius**
HAACP - **Joe O'Leary**
Fruit Production - **John Strang & Jerry Brown**
Reid's Cider Production - **Billy Reid**

Who's Who

Jerry Brown, Department of Horticulture, University of Kentucky, Princeton, KY.

Guy Delius, Kentucky Department of Public Safety - Food Branch, Frankfort, KY.

John Draper, Kentucky Department of Public Safety - Food Branch, Frankfort, KY.

Joe O'Leary, Department of Animal Sciences, University of Kentucky, Lexington, KY.

Billy Reid, Reid's Orchard, Owensboro, KY.

John Strang, Department of Horticulture, University of Kentucky, Princeton, KY.

Cider Production Flow Chart (Example)

Grading → Apple storage → Washing → Pressing → Juice Storage → Filling → Product Storage

Directions to the Daviess County Extension Office

Once at Owensboro, take Wendell Ford Expressway (US 60 By Pass) to US 231 exit. Turn right (south) at the end of the exit ramp. At the second stop light, which is across from Deer Park Elementary School, turn right into the Community College campus. Just past the first speed bump, turn left into the driveway and go to the rear of campus. "Daviess County Extension Service" is on the side of the building.

Directions to Moon Lite Barbeque from Extension Office

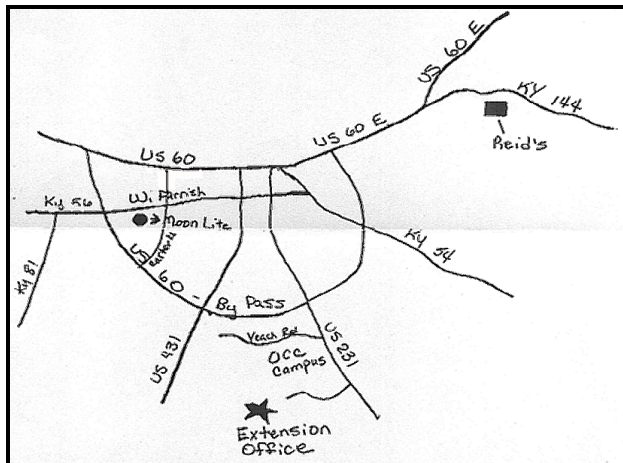
Turn left (north) out of Community College campus on US 231. At the US 60 By Pass, turn left, exiting west. Go to the KY 81/56 exit. Turn right (east) onto KY 81/56; go about three blocks (just past the first stop light) and Moon Lite is on the right.

Directions to Reid's orchard from Extension Office

Turn left (north) out of Community College campus on US 231. At the US 60 By Pass, turn right, exiting east. The By Pass ends at US 60 East; turn right. After approximately two or three miles, KY 144 Y's off to the right. Take KY 144 for one half mile; Reid's Orchard is on the right.

Disease Management in Dry Weather?

Is there a need to continue spraying if there has been no rain for several weeks and spray residue is still visible on fruit tree leaves? Since fruits are still enlarging and unexpected rains could provide fruit rot



infection opportunities, one should probably continue spraying. However, it depends.... It depends on the type of fungicides used. It depends on what kinds of diseases are likely to cause problems in the orchard. It depends on the disease pressure. It depends on how much rain really has fallen.

Fungicides used: Locally systemic fungicides such as Nova and Rubigan which move inside the leaf, protected from rain, lose their effectiveness after about a week or ten days in any case. The same should be true of Benlate or Topsin-M which are systemic. If they are needed, they might need to be reapplied. Protectant fungicides such as captan or mancozeb are likely still present on the leaves if they are visible. They might not need to be reapplied. There is little information available on how sensitive these protectants are to degradation by sunlight, but most of the concern about loss of

effectiveness is related to fungicide removal by rain.

Diseases and disease pressure: Scab - during dry weather leaf wetness will not likely be prolonged enough to worry about new infections. Should the weather change, the scab fungus, if it is present in the orchard (disease pressure) will resume activity. Growers can use a fungicide such as Nova to eradicate resulting infections even after the wetting event. Powdery mildew - this fungus does not need leaf wetness, just high humidity, and we have plenty of that. If there is a history of powdery mildew in the orchard, then growers should reapply their mildew fungicides because the captan or mancozeb residues don't control powdery mildew anyway. Fruit rot diseases - Enlarging fruits are not well protected because new fruit surfaces appear each day. Relatively short periods of wet weather are needed for infection, and "pop-up" thundershowers could provide that opportunity. This might be the most compelling reason to continue with protectant sprays. Sooty blotch and flyspeck - These diseases are active now. Our week or so of rain in late June caused the accumulation of enough leaf wetness hours to initiate infections by these diseases.

How much rain? It is said that anywhere from one-half to one inch of rain is needed to deplete half the fungicide residue on the fruit or foliage. It is important for growers to monitor the rainfall in the orchard to at least have an estimate of how much weathering has occurred. If more than half of the fungicide has been lost, it may be time to reapply. (Hartman)

Timing Summer Fungicides - Still an Experimental Approach

Reacting to the threat from summer diseases such as sooty blotch and flyspeck is the cause of much of the fungicide use in commercial orchards during the summer months in Kentucky. With improved understanding of the biology of the disease and the leaf-wetness hour models being developed here and in North Carolina and New York, growers have found it possible to reduce fungicide usage in early summer.

Biology of sooty blotch and flyspeck. Sooty blotch and flyspeck are two separate diseases that frequently appear together on the same fruit. Sooty blotch appears as dark, sooty smudges while flyspeck appears as clusters of tiny black dots. The fungi that cause sooty blotch, *Peltaster fructicola*, *Gastrumina polystigmatis*, *Lepodontium elatius*, and others, and flyspeck, *Zygothia jamaicensis*, overwinter on the twigs of many woody plants, especially brambles. The spores of these fungi are spread in wet weather by wind and splashing rain. Fruit infections can occur any time after petal fall, but are most prevalent during mid-to late summer. Both diseases are favored by high relative humidity and they flourish in orchards subject to heavy dews and fogs. Under ideal conditions, symptoms can develop within 14

days of infection, but symptom development is arrested by high temperatures and low relative humidity. Thus, the period between infection and symptom development may range from between 25 and 60 days.

A wet May and June such as we had last year would favor early development of summer diseases such as flyspeck and sooty blotch. However, in Central Kentucky this year, June has been dry and therefore it will take longer for symptoms to appear. Wet weather in early summer allows the causal fungi to build more quickly than normal in border areas that supply most of the summer disease inoculum for commercial orchards. In most years, the threat from sooty blotch and flyspeck peaks in July.

Managing sooty blotch and flyspeck.

- In so far as possible, remove and destroy nearby vegetation that could provide inoculum for disease outbreaks.
- Providing complete spray coverage in the tops and centers of trees is essential.
 - Proper sprayer calibration and nozzle orientation are obvious first steps.
 - Slow down travel speed while applying sprays to increase the volume of air.
 - Benlate and Topsin M both provide up to three weeks of protection, and Ziram provides about two weeks. Captan is not effective against sooty blotch and flyspeck, but is needed for several of the fruit rot diseases.
- Summer pruning will help reduce diseases by opening the tree canopy to allow more rapid foliage drying and better spray penetration.
- To conserve on fungicide and application costs, delay fungicide applications after first cover, especially if the season is not wet. If leaf wetness detectors are available, more precise timing is possible.
- Russeted fruit varieties are not susceptible to sooty blotch and flyspeck.

Using leaf wetness duration totals to determine when to spray. Plant pathologists from several states are testing the hypothesis that apple foliage must be wet a certain length of time during the summer for sooty blotch and flyspeck to develop on the fruit. Beginning 10 days after petal fall, researchers begin adding up all the hours of leaf wetness that have occurred, and when a certain threshold is reached, sprays are to be applied.

In North Carolina, using a string fiber as the leaf wetness detector, the threshold was found to be 200-250 hours. In New York, fungicide retention calculations for summer months suggested a threshold of 150 hours. Our research here in Kentucky showed that using simulated-leaf electronic wetness measurements, the threshold was 175 hours. Using this threshold, we could prevent sooty blotch and flyspeck in both wet and dry seasons. In wet seasons, the 175 threshold leaf wetness hours were reached within a few weeks of first cover, about the time it was necessary to spray by the calendar anyway. However, in dry seasons, several spray applications could be avoided. In one season, it was so dry that the leaf wetness threshold was not reached before harvest and the fruits never developed

disease symptoms. We used fruit bagging to verify the timing of disease occurrence.

The North Carolina, New York, and Kentucky leaf wetness-based sooty blotch and flyspeck disease models are being tested and shown to be useful in other states including Ohio, Massachusetts and Missouri. Each method results in good disease management with reduced fungicide application. Although experimentation is not yet completed, the New York model appears to be fairly safe, and the North Carolina model seems risky if electronic leaf wetness sensors are used. Thus, these systems are still experimental.

Measuring leaf wetness. There are several instruments, many in use in Kentucky orchards, that will collect leaf wetness data that could be used for sooty blotch and flyspeck management. They include Envirocaster, Metos, Show-Me Plant Disease Forecaster, and Spectrum data loggers. These units cost anywhere from \$350 to \$3,500 depending on weather parameters measured and on whether or not one uses their own computer and communication systems. In a future article, these instruments will be more fully described.

What about fruit rot diseases? We do not know for sure what effect reduced summer sprays will have on outbreaks of apple fruit rot diseases such as black rot, white rot, and bitter rot. For growers who have in previous growing seasons observed high levels of these fruit rot diseases in their orchard, omitting fungicide sprays in early summer is probably too risky to try. (Hartman)

Azoxystrobin is Toxic to Some Apple Varieties

The EPA has issued an alert concerning injury caused by azoxystrobin, which is marketed as Abound, Heritage, and Quadris. This fungicide has a low toxicity on most all crops and is of low toxicity on humans and terrestrial animals. However, it is extremely toxic to McIntosh and varieties with McIntosh in their parentage. The symptoms include necrosis (dead tissue), leaf drop, and fruit drop. Phytotoxicity has occurred on susceptible varieties as a result of drift and trace residues left in sprayers.

Apple varieties that are known to be affected by azoxystrobin are Akane, Asahi, Bramley, Courtland, Cox's Orange Pippin, Cox, Delbarestival, Discovery, Gala, Galaxy, Grimes, Imperial Gala Kent, Kizashi, Laurared, Macoun, McIntosh, Molly Delicious, Mondial Gala, Ontario, Queen Cox, Royal Gala, Spartan, Stark Gala, Starkspur McIntosh, Summer Red, Summer Treat, Warabi Worchester, and Pearmain. (Adapted from Purdue University Facts for Fancy Fruit newsletter)

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A New Fungicide for Strawberry Gray Mold and Grape Bunch Rot

There is now a new fungicide cleared for use on Grapes and Strawberries, according to recent information provided by the TomenAgro Company. The fungicide, called Elevate, is formulated as a 50% water dispersible granule containing the active ingredient fenhexamid. Elevate is a protectant fungicide used for control of gray mold of strawberry and bunch rot of grapes, both caused by the fungus *Botrytis cinerea*. Although this announcement comes too late for this year's strawberry season, it is possible that growers may want to try this fungicide on grapes for botrytis bunch rot management. It can be tank-mixed with other protectant fungicides for increased efficacy and for resistance management. Spray application equipment that provides complete coverage of the foliage is essential for use of this and other protectant fungicides. (Hartman)

Receiving Fruit Facts Electronically on the Internet

Fruit Facts is available on the web in the pdf format. To get notification of the monthly Fruit Facts posting automatically and approximately two weeks earlier than it would normally be received via mail, you can subscribe to the UK College of Agriculture's Majordomo list processor.

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

To subscribe type "majordomo194@ca.uky.edu" in the To: line of your e-mail message. Please enter a subject in the Subject: line - the system needs for the Subject line not to be empty (blank).

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John Strang, Extension Horticulturist