



Kentucky Fruit Facts

Research & Education Center

P.O. Box 469, Princeton, KY 42445

June 1999 (6-99)

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

Fruit Situation

This season is beginning to look like it will be a dry one. Subsoil moisture levels are fairly low across the state and most growers are scanning the skies for rain.

The strawberry season was a little surprising. Berry size dropped off rapidly, especially on Earliglow, resulting in relatively low yields. Botrytis losses have been minimal. We have noted some Eastern flower thrip damage in some plantings. This injury shows up on the berries and makes the berry tip a dull bronzed color and fruits may be smaller and seedier as a result of thrip feeding. Generally berry quality and flavor have been excellent. We are attributing the small berry size to a dry fall and dry spring conditions.

The apple crop looks excellent in most cases. Fruit set has been heavy on most cultivars, but it does vary depending on if the bloom period coincided with cool rainy weather. In many cases all five fruit set on a spur, but the king bloom fruit is not the largest, due to poor pollination. Many growers are augmenting their chemical thinning program with hand thinning. Fire blight has been severe in some orchards and practically nonexistent in others. This was a good year to run the Maryblyt program since we had at least two infection periods in most orchards and

there were six infection periods in the Breathitt county area of eastern Kentucky.

Codling moth pheromone trap catches are up at least in the Lexington area. There are also lots of potato leafhoppers in our orchards. Look for yellowing on apple leaf margins and leaf cupping. This type of injury can reduce growth on young trees. Consult the Commercial Tree Fruit Spray Guide for insecticide recommendations.

We extend our condolences to Jack Flippin and his family. Jim Bell, Jack's son-in-law passed away recently. (Strang, Brown, Hartman, Bessin)

Meetings

Jun. 17 - Commercial Apple IPM Workshop, Kevan Evans Orchard, Georgetown, KY. See below for the program and directions.

Jun. 17 Sustainable Agriculture Workshop, Kentucky State University Farm, 1525 Mills Lane, Frankfort, KY. Topics: Aquiculture - Farm Ponds, Fish Culture, Cage Culture, Shrimp, Marketing and Grants. Contact 502/564-5871 or 5869.

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,

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UNIVERSITY OF KENTUCKY, KENTUCKY STATE UNIVERSITY, U.S. DEPARTMENT OF AGRICULTURE, AND KENTUCKY COUNTIES, COOPERATING

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, ext. 216 See article below.

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

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

Apple IPM Workshop Set for Thursday, June 17

Evans' Orchard, Kevin Evans, Georgetown, KY 502/863-4550. Contact Mark Reese, Scott County Extension Agent for Agriculture 502/863-0984.

All apple growers, Extension Agents, and educators are invited. We are pleased that Billy Ray Smith, Kentucky Commissioner of Agriculture will be in attendance. Don't forget to make a reservation for lunch (see below).

Directions: From Lexington take Newtown Pike (Rt. 922) north 8 miles from I-75/I-64. Turn right on Stone road at the Evans Orchard sign. The orchard entrance is at Evans' house about one block on the left.

I-75 from the south take Georgetown exit 125 and turn right onto Rt. 460. Travel about 3 miles east on 460 and turn right onto Rt. 922. Proceed 0.8 miles to Stone Rd. and turn left at the Evans Orchard sign and proceed as described above.

I-75 from the north take Georgetown exit 126 and turn right off the exit ramp. Follow signs to Rt. 460 through a commercial area. Turn left onto Rt. 460 at the light (don't get on the bypass), travel about 3 miles east to Rt. 922, turn right and proceed as described above.

Agenda - All times CDT

- 10:00 am - Welcome and introduction to Scott County -Mark Reese, Scott County Extension Agent
- 10:10 am - Introduction to orchard and market - Kevin Evans, grower
- 10:30 am - Orchard tour and IPM workshop (all events outdoors).

The following topics will be covered:

- Trickle irrigation for fruit crops (Jerry Brown)
- Insect scouting exercise and fruit bagging (Ric Bessin)
- Disease scouting and summer disease control (John Hartman)
- Fruit marketing (John Strang).
- 12:30 pm - Lunch (**Please reserve in advance by calling Mary Ann Kelley at the U.K. Experiment Station, Princeton 502/365-7541, ext. 216 between 8:30 and 4:30, before June 15.**)
- 1:00 pm - Remarks by Agriculture Commissioner Billy Ray Smith
- 1:15 pm - The new "Show Me" predictor and computer interface Evans, Strang, Bessin, Hartman
- 2:00 pm - Grower round table discussion President, KSHS
- 3:00 pm - Adjourn

Lunch will be available at cost for those that preregister. The cost will be in the range of \$6.00. (Bessin, Brown, Hartman, Strang)

HACCP Training Scheduled for Kentucky Apple Cider Producers

The University of Kentucky, Cooperative Extension Service, Kentucky Department of Public Safety and possibly the FDA will present a Hazard Analysis of Critical Control Points (HACCP) Program for producers of both treated and untreated cider. The time is July 20, 1999, 9 am CDST starting at the Daviess County Extension Office and completed at Billy Reid's Orchard. A detailed schedule should be available next week. Call Mary Ann Kelley at 270/365-7541, ext. 216, to obtain schedule or to register for the meeting. (Brown)

Crown Gall Affects Fruit Crops

Of the more than 600 types of plants susceptible to crown gall disease, perhaps the most damaged are the fruit crops. Crown gall disease is especially devastating to grapes in Kentucky, but it can also affect apples, stone fruits, and brambles.

Symptoms. The disease is characterized by galls or knobby overgrowths that form on susceptible plant tissues.

Grapes. Galls develop following an injury permitting entrance of the pathogen and may appear on the roots, trunk, and arms of grape vines. Such injuries may occur during intermittent freezing and thawing weather common to Kentucky each winter. *Vitis vinifera* grape cultivars are more susceptible than *V. labrusca*. The bacteria can live systemically inside the grapevines, and sometimes, galls may not develop until after the grapes are injured.

Apples and stone fruits. Galls form on the roots and crowns of the trees. They are often located at pruning wounds. Apple rootstocks M.7, M.9, and M.26 are the most susceptible.

Brambles. The lower canes of brambles are affected by crown gall and a related disease called cane gall. Sometimes infected canes become weakened and break. The disease may have little impact on plant growth and production or may cause complete death. Black and purple raspberries are more often affected than red raspberries or blackberries.

New galls first appear in early summer as white, fleshy, callus growth. Galls turn brown by late summer and in the fall become dry and corky. The woody tumors may be gnarled with rough surfaces. Galls can develop rapidly and completely girdle a young plant in one season, or they may take a few years to develop. When galls are numerous or when they are located on the major roots or on the root crown, they disrupt the translocation of water and mineral elements, leading to poor growth, gradual dieback, and sometimes death of vines, trees, or canes. In general, affected plants are more susceptible to adverse environmental conditions, especially winter injury.

Cause and biology of the disease. Crown gall is caused by the soil-borne bacterium, *Agrobacterium tumefaciens* (cane

gall of brambles, by *Agrobacterium rubi*). The bacterium survives for long periods of time in soil, and also in galls and in diseased plants. A fresh wound is required for infection and gall formation to begin; such injuries may include those caused by pruning, budding and grafting, cultivation, harvesting, insect feeding, or freezing temperatures. Overwintering bacteria may be spread to wound sites by splashing rain, running water, on cultivation implements or on pruning tools. Contaminated nursery stock may be another source of the disease. The bacteria can survive in the soil for many years.

Disease management. Select planting sites with no history of crown gall, or wait at least 5 years before replanting such sites.

Plant only certified, disease-free nursery stock; discard plants with galls.

Minimize root injuries during planting.

Reduce freeze injury by careful site selection and use of cold-tolerant cultivars.

Plant vines, trees, and canes in well-drained soil.

Adopt management practices that minimize wounding.

Hill up soil around grapevines or otherwise protect the lower trunk in fall to reduce winter injury and resulting wound sites needed for infection.

Remove and destroy infected plants.

Galls can sometimes be pruned out.

A microbial antagonist, or biological control such as Norbac 84 or Galltrol, may be effective for stone fruits, but not for apples or grapes. These biocontrol agents must be applied before trees are transplanted into the orchard.

Soil fumigation is generally not effective for destroying the pathogen. (Hartman)

Evaluate Grape Crop Potential

If you haven't already, now is the time to determine the average cluster number in each vineyard. Knowledge of crop potential is needed now, if you are

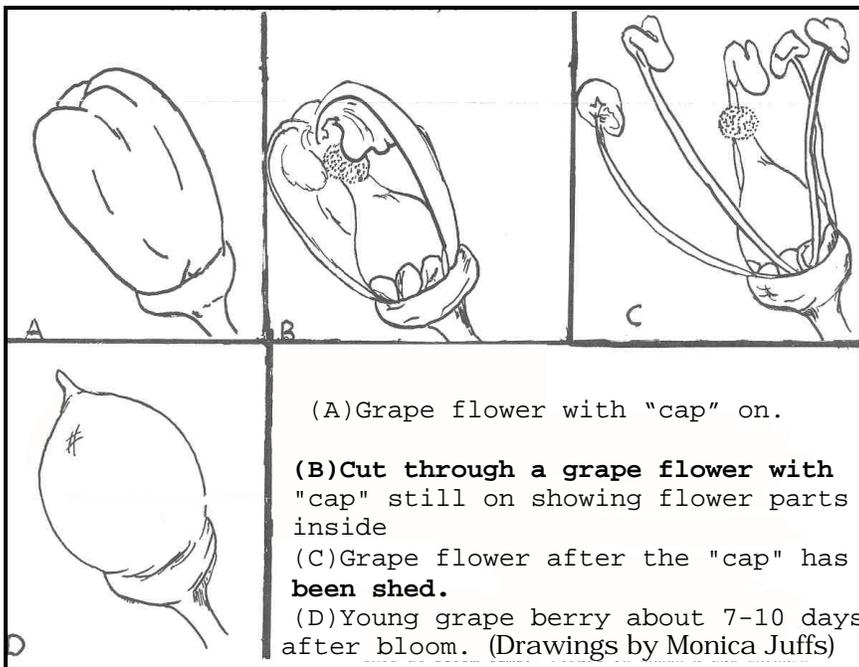


Figure 1.

(A) Grape flower with "cap" on.

(B) Cut through a grape flower with "cap" still on showing flower parts inside

(C) Grape flower after the "cap" has been shed.

(D) Young grape berry about 7-10 days after bloom. (Drawings by Monica Juffs)

to make intelligent decisions about crop regulation and other cultural practices. Should you be "suckering" and "thinning" because of an excessive cluster number? Should you be letting cover crop and weed competition grow in an effort to prevent excessive vegetative growth, or should you be eliminating competition and attempting to stimulate vegetative growth? The answers to all of these questions, and more, depend on your having a reasonably accurate estimate of the crop potential in each of your vineyards.

Figure 1A shows an individual grape flower just prior to bloom. It shows the calyptra or "cap" which protects the flowers inside before it is shed at bloom time. **Figure 1B** shows a cut through a grape flower with the "cap" still attached. The flower parts are seen tucked inside the "cap". **Figure 1C** shows an individual grape flower after the "cap" is shed. The five stamens

(or male parts of the flower) provide the pollen to fertilize the pistil (female part of the flower) in the middle. When fertilization occurs, the swollen base of the pistil, develops into the grape berry.

Figure 1D shows the early development of a grape berry about 7-10 days after bloom. At this stage, the stamens have dropped off, the berry is approximately 3/16" in diameter, and the berry still has the somewhat pointed shape of the pistil. Because the pistil in the middle of the grape flower is destined to grow into the grape berry, it is the primary target for sprays during bloom. After bloom, it is the young berry that needs protection. (Vineyard Notes, Cornell University)

The Use of 'Saia' Oats and Ammonium Sulfate Suppress Strawberry Black Root Rot

The combined effects of rotation crops and nitrogen fertilizers were examined on the strawberry black root rot disease complex (*Rhizoctonia fragariae* and *Pratylenchus penetrans*). In July 1995 at Windsor, Connecticut, USA, microplots were filled with soil that had

a history of strawberry black root rot and seeded with 2 types of oats (*Avena strigosa* 'Saia oats' or *A. sativa* 'Garry oats') or with sorgho-sudangrass (*Sorghum bicolor* x *S. sudanense* 'Triple S'). Microplots planted with 1-year-old 'Honeoye' strawberry crowns served as the controls. In May 1996, the crops were chopped and incorporated into the soil. The soil was replanted with 1-year-old strawberry 'Honeoye' crowns and then fertilized with $(\text{NH}_4)_2\text{SO}_4$ or $\text{Ca}(\text{NO}_3)_2$ at equivalent rates of N. Two months later, $(\text{NH}_4)_2\text{SO}_4$ treated plants had 36% more

leaf area and 41% more runners than strawberries treated with $\text{Ca}(\text{NO}_3)_2$. Strawberries that had been pre-cropped with 'Saia' oats had 135% more runners and 38% more early fruit yield than strawberries grown in control microplots. Total fruit yield was not affected by the treatments. Compared to $\text{Ca}(\text{NO}_3)_2$, the $(\text{NH}_4)_2\text{SO}_4$ treatment reduced the percentage of blackened roots. The influence of the cover crops on growth and disease was stronger with $(\text{NH}_4)_2\text{SO}_4$ fertilization than with $\text{Ca}(\text{NO}_3)_2$ fertilization. Combining 'Saia' oats or sorgho-sudangrass rotation with $(\text{NH}_4)_2\text{SO}_4$ fertilization reduced lesion nematode (*P. Penetrans*) numbers in subsequent strawberry roots when compared to controls. Also...the combination of 'Saia' or 'Garry' oats as a pre-crop with applications of $(\text{NH}_4)_2\text{SO}_4$ reduced black root rot severity when compared to controls. Only the 'Garry' oat rotation reduced strawberry root colonization by *R. fragariae* when compared to controls. Other effects were associated with using $(\text{NH}_4)_2\text{SO}_4$.

The $(\text{NH}_4)_2\text{SO}_4$ treatment lowered the rhizosphere soil pH by 0.2 units, reduced the numbers of fluorescent pseudomonads in the rhizosphere by 10- to 15-fold, and produced leaves that had more N, K, S, Mn, and Zn content than plants treated with $\text{Ca}(\text{NO}_3)_2$. Rotation with 'Saia' oats combined with $(\text{NH}_4)_2\text{SO}_4$ fertilization may suppress strawberry black root rot and increase yields through multiple effects on the host, pathogens, and associated microflora. (W.H. Elmer, J.A. LaMondia, Connecticut Agricultural Exper. Station)

Kentucky Fruit Alert List Serve Active

The Kentucky Fruit Alert (aalert) is a list serve operated by the University of Kentucky Integrated Apple Management group. It is intended to inform commercial growers (mostly apple) and county agents through e-mail on a timely basis of fruit pest outbreaks in the state, as well as provide timely information on cultural operations and marketing. Commercial growers and county agents that would like to be part of this discussion group should contact John Strang at jstrang@ca.uky.edu to be placed on the list. (Strang)

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Kentucky Department of Agriculture Value Added Grants Program Continued

The Kentucky Department of Agriculture announced that it is opening the second round of funding for the Value-Added Grants Program. This program is funded by the General Assembly and is designed to increase marketing opportunities for Kentucky agricultural products.

Grant availability is limited to non-profit associations and organizations acting on behalf of producers. Grant applications must be received by 4:30 p.m. on Friday, July 16, 1999. Announcements for funding will be made by October 1, 1999 and all funds must be utilized by June 30, 2000.

Additional information may be obtained by contacting Cindy Ellis at 502/564-6676, Ext. 233. Specific information on fruit and vegetable grants may be obtained through Jim Mansfield at 502/564-4696. (Strang)

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

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John Strang, Extension Horticulturist

