UK COOPERATIVE EXTENSION SERVICE
University of Kentucky – College of Agriculture

Lexington KY 40546

Kentucky Fruit Facts

July 2005 (7/05)

Fruit Facts can be found on the web at: http://www.ca.uky.edu/fruitfacts/

John Strang, Extension Fruit Specialist, Editor
Karen Shahan, Administrative Assistant

Fruit Crop News

It has been dry over much of the state and this has minimized disease pressure. However, the diagnostic labs are still noting some fruit diseases: fire blight, cedar-apple rust and frog eye leaf spot on apple; bacterial spot and scab on peach; black rot, phomopsis cane and leaf spot and crown gall on grape; botrytis twig blight on blueberry; botrytis gray mold and phomopsis leaf blight on strawberry. Watch for Japanese beetles!

Blueberry, black raspberry, and thorny blackberry harvest are proceeding well. Thornless erect blackberries are just beginning to ripen. It is important to water small fruit crops to assure berry quality and yield. Strawberry growers should have their plantings renovated by now. Runner plants that are set earlier in the season are generally the most productive plants next season.

Vineyard site visits have frequently revealed low vine nitrogen levels (leaves with a yellowish cast that are smaller than normal and reduced shoot growth), and deficiencies of potassium (older leaves with white edges), and boron (clusters that have not set many berries, not to be confused with clusters that have no berries due to frost injury). Fifty pounds of actual nitrogen per acre should be applied to bearing vines now as ammonium nitrate if soil

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needs acidifying or as urea if the soil pH is too low. Growers that have grapes on high cordons or Geneva double curtain systems should be combing the new canes down so that they are perpendicular to the ground, to facilitate better light interception on the buds that will be left for next years crop. Grapes on vertical shoot positioning (VSP) systems need to have the shoots combed upward and tucked between the catch-wires. We are rapidly approaching the end of the best period for grape cluster thinning.

Upcoming Meetings

Jul. 7. Franklin County Field Day, Home Fruit Orchard Care, Frankfort, KY Contact Edie Greer 502-695-9035.

Jul. 11 UK/KVS Viticulture Workshop, Elk Creek Hunt Club, Owenton, KY. Contact Kim Strohmeier 502-484-5703. See program and directions below.

Jul. 12-13 Kentucky Farm Bureau 5th Annual Farm Marketing Bus Tour, Gagel's Truck Farm, Louisville, KY; Corya Farms, Seymore, IN; Oliver Winery, Bloomington, IN; Anderson Orchards, Mooresville, IN; and Dillman Farms, Bloomington, IN. Cost: $30, registration fee, $93.24 hotel. Contact J. K. Henshw, Kentucky Farm Bureau, P.O. Box 20700, Louisville, KY 40250. Phone: 502-495-5000; e-mail jkhenshaw@kyfb.com

Jul. 13-15 American Society for Enology & Viticulture Eastern Section 30th Annual Technical Meeting and Symposium, Cutting-edge Cultivars: Highlighting Pinot gris, Traminette, Norton, and New Cold Hardy Cultivars, St. Louis, MO. For information see web site at www.nysaes.cornell.edu/fst/asev/

Jul. 28 U.K. Research and Education Center All Commodity Field Day, Princeton, KY. Contact Richard Coffey 270-365-7541 ext. 244.

Jul. 29 Canopy Management, Cropload Management, and French Hybrid Grape Workshop. Southern Illinois University, Carbondale, IL. This workshop, featuring Dr. Richard Smart and our own Dr. Kaan Kurtural, is sponsored by the Illinois Grape Growers and Vintners Assoc. This is a once in a lifetime opportunity to hear Richard Smart from New Zealand speak. Richard wrote the book, "Sunlight into Wine - A Handbook for Winegrape Canopy Management". Meeting cost is $35.00 for Kentucky growers. Contact: Elizabeth Wahle 618/ 692-9434 or Bill Shoemaker 630/584/7254.

Aug. 17-19 North American Strawberry Grower Associations 8th Annual Summer Tour, Farming on the Urban Fringe, lower Hudson area of New York. Check the NASGA website for details, http://www.nasga.org/

Sept. 19 Harvesting the Fruits of Your Labor, (A walk through the orchard to observe different varieties and different root- stocks). Sun Ray Orchard, Shepherdsville, KY. 6:00 p.m. Contact Darold Ackridge 502-543-2257.

Oct. 17 Tasting the Fruits of Your Labor (taste about 20 different apple varieties). Bullett County Extension Office, Shepherdsville, KY. 7:00 p.m. Contact Darold Ackridge 502-543-2257.

Jan. 10-11 2006 Kentucky Fruit and Vegetable Grower Conference and Trade Show, Holiday Inn North, Lexington, KY. Contact: John Strang 859-257-5685, e-mail: jstrang@uky.edu

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University of Kentucky/Kentucky Vineyard Society Viticulture Workshop

Monday July 11, 2005

Elk Creek Hunt Club/Vineyards
(502) 484-4569
http://www.elkcreekhuntclub.com

Directions:

Elk Creek is located at the Intersection of KY Highways 227 and 330 in Owenton KY. **From Lexington:** Follow Interstate 64 West to Exit 53. At Exit 53, follow Highway 127 North to Highway 227 south. **From Cincinnati:** Follow Interstate 75 south to Exit 144. At Exit 144 follow Highway 330 west. **From Louisville:** Follow Interstate 64 East to Exit 53. At Exit 53, follow Highway 127 North to Highway 227 south.

Please pre-register by **July 1, 2005**, by calling Kim Strohmeier at the Owen County Extension office at (502) 484-5703 so that dinner arrangements can be made.

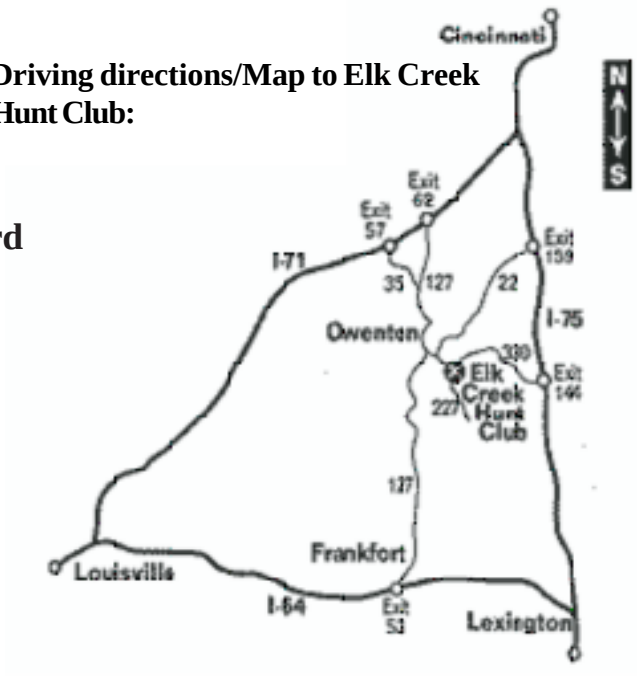
For more information regarding the program please call Kaan Kurtural, Extension Viticulture Specialist at University of Kentucky: 859 257-1332.

Program: ALL TIMES EDT

12:30 p.m. Registration

12:45	Welcome Jim Wight, President Kentucky Vineyard Society
1:00	Disease Management for the Current Season in Grapes - John Hartman, University of Kentucky
1:30	Insect Control in Kentucky Vineyards - Ric Bessin, University of Kentucky
2:00	Bird and Deer Depredation Control in Midwestern Vineyards - Brad Taylor, Southern Illinois University
3:00	Break
3:15	Shale Soils and Their Limitations/Benefits in Viticulture - Greg Schwab, University of Kentucky
4:00	Training and Caring for Young Vines - Kaan Kurtural, University of Kentucky

Driving directions/Map to Elk Creek Hunt Club:



Are Fungicides Needed for Fruit Disease Management in Dry Weather?

by John Hartman, U.K. Extension Plant Pathologist

For the past five weeks Kentucky fruit growers have faced less disease pressure than has been experienced in recent years. Aside from two moisture-driven infection periods May 13 - 15 and 19 - 21, there have been few or no other disease-favorable weather events. Many Kentucky locations have received less than two inches of rain since the first of May. During this same period in 2004, many locations received ten or eleven inches of rain, and in 2003, seven or eight inches. Fruit crop disease management was difficult in 2003 and 2004.

Growers might be wondering whether or not there is a need to continue spraying their fruit trees or grapes if the fungicide residue is still visible on the leaves. The lack of rain for several weeks has limited the washing-off of fungicide residues. Since fruits are still enlarging and new foliage is still emerging, unexpected rains could still provide foliage and fruit rot infection opportunities. Thus, one should probably continue spraying. However, it depends....
It depends on the type of fungicides used and it depends on what kinds of diseases are likely to cause problems in the orchard or vineyard. It depends on whether diseases are currently under control. With scattered pop-up showers in the forecast, it depends on how much rain falls and how long leaves would remain wet.

Diseases and disease pressure:

o Apple scab - If, because of diligent early-season management, apple scab is absent from the orchard, secondary infections from prior scab lesions are not likely. In addition primary inoculum from last year's infections is likely all gone. Scattered showers often don't provide prolonged leaf wetness to cause infection problems in any case. 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, Rubigan, or Procure to eradicate resulting infections even after the wetting event.

o Grape black rot - Grape vines are still elongating and large amounts of unprotected plant tissue are vulnerable to attack. The fruits, at or just past bloom, are also vulnerable. Continued fungicide applications are advised, but if diseases are absent from the vineyard, application intervals can be stretched during dry weather.

o Peach scab - The critical shuck-split spray period is past, but fungicide use needs to continue, especially for brown rot management as fruit begins to ripen.

o Apple and grape powdery mildew - For infection to occur, 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 or vineyard, then growers should reapply their mildew fungicides because the captan or mancozeb residues don't control powdery mildew anyway.

o Apple fruit rot diseases - Enlarging fruits are not well protected because new surfaces appear each day. Relatively short periods of wet weather are needed for infection, and "pop-up" thunder- showers could provide that opportunity. This might be the most compelling reason to continue with fungicide sprays.

o Apple Sooty blotch and flyspeck - These diseases are not likely to become active until much later in the season if dry weather persists. Fungicides used: Locally systemic fungicides such as Nova, Procure, and Rubigan which move inside the leaf, lose their effectiveness after about a week or ten days in any case, even when they are protected from rain. The same should be true of Topsin-M which is systemic, and strobilurin fungicides such as Abound, Flint, or Sovran which are mesosystemic. If these fungicides are called for, 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.

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 and the vineyard 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.

Phosphorous Acid Fungicides Explained

by John Hartman and Kenny Seebold,
Extension Plant Pathologists

Kentucky fruit and vegetable growers may have noticed that phosphorous acid has been listed for management of several fruit diseases in recent editions of the commercial tree fruit and small fruit spray guides and management of several vegetable diseases on recent product labels. Some County Extension Agents and growers have been curious to know how they work. Parts of the following material was adapted from an insightful article written by Annemiek Schilder, Michigan State University Plant Pathologist, and was published in the Michigan State University Fruit Crop Advisory Team Alert, Vol. 20, No. 5, May 10, 2005.

Phosphorous acid fungicides

Recently, a number of new fungicides that have phosphorous acid as the active ingredient have come on the market. Other names sometimes used for this group are phosphonates or phosphites. Commercial products in this group may include ProPhyt®, Phostrol® and Agri-Fos®. Aliette® (fosetyl-Al), an older fungicide, is the prototype for this group of fungicides. However, the long-standing patent on Aliette® had prevented similar fungicides from being developed until recently. In Australia, where the patent did not apply, growers have been using the phosphorous acid fungicides for over a decade.

Phosphorous acid is not fertilizer. The term "phosphorous acid" should not be confused with phosphoric acid or phosphorus (P), a fertilizer component. In fertilizers, P is normally found in the form of phosphoric acid (H_3PO_4), which readily disassociates to release hydrogen phosphate ($HPO4^{-2}$) and dihydrogen phosphate ($H_2PO_4^-$). Both of these ions may be taken up by the plant and are mobile once inside the plant. Phosphorous acid is H_3PO_3. A single letter difference in the name of a chemical compound can make a major difference in its properties.

Phosphorous acid releases the phosphonate ion (HPO_3^{2-}; also called phosphite) upon disassociation. Phosphonate is easily taken up and translocated inside the plant. Phosphorous acid does not get converted into phosphate, which is the primary source of P for plants. Because phosphorous acid and its derivatives do not get metabolized in plants, they are fairly stable and probably contribute little or nothing to P nutritional needs of the plants.

Some researchers have investigated the ability of phosphorous acid to act as a nutrient source for plant growth and found that P deficiency symptoms developed with phosphorous acid as the sole source of P. This means that although phosphorous acid can control diseases, it is not a substitute for P fertilization. The inverse is also true: phosphate is an excellent source of P for plant growth, but is unable to control diseases other than improving the general health of the crop. So applying high amounts of P fertilizer will not work as a disease control measure.

Diseases managed with phosphorous acid. Researchers have found that phosphorous acid fungicides are especially effective against Oomycete pathogens, such as Phytophthora, Pythium, and downy mildews in a number of crops. Our fruit spray guides list Phytophthora collar rot and root rot of tree fruits, blueberries, and brambles; strawberry red stele and leather rot; and grape downy mildew as targets for phosphorous acid fungicides. Phosphorous acid is labeled for use on brassicas (broccoli, cabbage, cauliflower); cucurbits; edible legumes; Solanaceous crops (eggplant, pepper, potato, tomato, and tobacco); onions; and a number of leafy vegetables for management of diseases caused by Phytophthora, Pythium, Rhizoctonia, and Fusarium spp. Downy mildews of these crops are also listed on product labels. Materials containing phosphorous acid, in general, have performed best against Phytophthora blight and downy mildews. Preventive applications were more effective in reducing season-long severity of disease than those applied after disease onset.

Phosphorous acid has a direct and possibly an indirect effect on these pathogens. It inhibits a particular metabolic process (oxidative phosphorylation). In addition, some evidence suggests that phosphorous acid has an indirect effect by stimulating the plants natural defense response against pathogen attack. This probably explains the much broader spectrum of activity observed in many fungicide efficacy trials. In fruit crops, it has been found, for instance, that ProPhyt had efficacy against downy mildew, Phomopsis cane and leaf spot, and black rot (but not much against powdery mildew) in grapes. There is also evidence of activity of these compounds against anthracnose in blueberries.

The phosphonate ion is highly systemic and fairly stable in plants. The systemic activity allows them to be applied as foliar fungicides for prevention of Phytophthora and Pythium root rots. They may

also display some curative activity. In general, applications every 14 days seem to be effective in grapes, but follow label directions. These fungicides are sold as solutions of potassium and/or sodium salts of phosphorous acid. To compare them, one should look at the phosphorous acid equivalent, which should be listed on the label.

Fungicide precautions. Phosphorous acid fungicide prices range from about $25 to $35 per gallon, and the application rate ranges from 2 to 5 pt/ acre ($6.25 to $22 per acre, depending on the product and rate). Under high disease pressure, higher rates may need to be used and spray intervals tightened. These fungicides are formulated in salt form, so care must be taken not to exceed a certain concentration, as crop injury may result. In addition, if the concentration is too high, the pH may become so low that in tank mixes with copper products (particularly copper hydroxide such as Kocide), too much copper will become available and result in crop injury.

Pawpaw Tasting Highlights Kentucky State/Pawpaw Foundation Workshop

by Kirk W. Pomper, K.S.U., USDA Pawpaw Germplasm Repository, Frankfort, KY

The Kentucky State University/Pawpaw Foundation Pawpaw Workshop was the setting for a pawpaw variety taste test on September 11, 2004. This was an informal taste test without strict guidelines/ however, some interesting trends are noticeable in the preferences of the people who participated in the tasting experience.

How was the test conducted? Each participant received a copy of the accompanying evaluation sheet, and slices of the pawpaw varieties were available on plates on a table. About 100 people attended the workshop; however, as can be noted in the “n” column above, between five and 33 people tested each selection. Participants were not required to taste all the selections; therefore, some people may have tasted only a subset of the selections. Whole uncut fruit were also placed on each plate with the cut slices, so the size and appearance of the fruit, as well as pulp color, could have influenced whether a person chose to taste the pawpaw variety.

The greatest number of people ranked the pawpaw variety NC-1 in the excellent category. The selections Shenandoah, 1-7-2, 4-2, and K2-7 all received at least ten excellent ranking by participants. The former two selections, 4-2 and 1-7-2, will be released by Neal Peterson in the near future as new cultivars. Both K2-7 and K8-2 fared well in the taste test; these selections will be released as new cultivars this year by KSU.

Participants also commented on particular taste attributes. Many people have stated in the past that they believe that Overleese has a melon aftertaste; five of the 33 people who evaluated Overleese indicated that they detected a melon aftertaste. The melon aftertaste is a positive attribute for some people and a negative attribute for others.

Since PA-Golden is a very early ripening variety, the fruits from this cultivar were held in the refrigerator in self-sealing plastic bags for about two weeks prior tot he taste test. This could have caused a decline in fruit quality; however, we did note generally poor flavor and an astringent quality in fresh PS-Golden fruit this year. We do not recall PA-Golden fruit having this poor flavor previously. We will be tracking year to year variation in fruit flavor in the future.

Only limited quantities of the pawpaw variety Susquehanna were available; however, the five people who tasted it all ranked it in the excellent category.

PAWPAW FLAVOR								
Selection	1 Excellent	2 Good	3 Fair	4 Poor	5 Awful	Melon aftertaste	Bitter aftertaste	n*
Shenandoah	14	16	3			2		33
1-7-2	14	13	5			4		32
4-2	10	13	1	4		5	3	28
7-90	6	6	12	4	1	1	1	29
10-35	7	10	7	3		3	4	27
Overleese	8	11	10	4		5	1	33
PA-Golden		4	11	8	4	1	5	27
Zimmerman	5	11	10	1	1	2		28
NC-1	15	8	5	3		4	2	31
Prolific	4	10	12	1		1	2	27
Taylor	6	9	11	2		1		28
Taytwo	2	6	12	3		3	6	23
Sweet Alice	4	11	11	3		2	1	29
Middletown	5	5	9	2	2	1	2	23
Wells	1	3	12	6	1	1	3	23
K2-7	10	10	7	1		1	1	28
K8-2	2	13	7	4		3	1	28
Mitchell	2	11	5	3		2		21
Shawnee trail	9	9	3			4	2	21
Susquehana	5							5

The chart above shows the numbers for each of the pawpaw varieties that were tasted and rated by workshop participants.

Potential Garden, Field and Wildland Reservoirs of Soybean Rust in Kentucky

by John Hartman, Kenneth Seebold, and Paul Vincelli, U.K. Extension Plant Pathologists

Soybean rust disease, caused by the fungus *Phakopsora pachyrhizi*, is newly introduced into the U.S. and is a potential threat to the Kentucky soybean industry. Commercial and garden beans are also susceptible and could suffer losses. Many other plants in the pea family (Fabaceae), both cultivated and wild, could serve as potential hosts of the soybean rust fungus. In consequence, infected plants could serve to provide primary inoculum to commercial soybean crops or in some cases could serve as an early warning for field development of soybean rust.

The following list of cultivated and native and naturalized hosts includes plants found in Kentucky that are known hosts of soybean rust elsewhere; also this list includes potential host plants belonging to the same genus, but not the same species of known hosts. The susceptibility of these hosts, especially under our conditions, is not known.

Cultivated hosts and potential hosts

• Bean (*Phaseolus vulgaris*) common garden bean, known soybean rust host (SRH).
• Blackeyed Pea (*Vigna unguiculata*) common garden blackeyed peas, known SRH.
• Clover (*Trifolium spp*.)
• Crimson clover (*T. incarnatum*) forage and pasture legume, known SRH.
• White clover (*T. repens*) common pasture legume and lawn weed, known SRH.
• Crown vetch (*Coronilla varia*) common statewide, used in road cut plantings with some escapes, known SRH.
• Hyacinth bean (*Lablab purpureus*) cultivated as an ornamental, known SRH.
• Japanese clover (*Kummerowia striata*) forage legume, known SRH.
• Korean clover (*Kummerowia stipulacea*) forage legume, escaped into open areas, known SRH.
• Lespedeza (*Lespedeza bicolor*) forage legume, known SRH.
• Lima, or butter bean (*Phaseolus lunatus*) common garden lima bean, known SRH.
• Lupine (*Lupine alba, L. angustifolius, L. hirsutus*) common garden perennial flower, known SRH.

• Pea (*Pisum sativum*) common garden pea, known SRH.
• Soybean (*Glycine max*) soybean, the major host of soybean rust.
• Vetch (*Vicia spp.*).
• Hairy vetch (*V. villosa*) escaped from cultivation to open areas and roadsides.
• Spring vetch (*V. sativa*) European native, escaped from cultivation to open areas.
• Yellow sweet clover (M*elilotus officinalis*) pasture and forage legume, escaped into open areas, known SRH.

Native and naturalized hosts and potential hosts
• Bush-clovers (*Lespedeza spp., Kummerowia sp.*)
• Bush-clover (*L. intermedia*) upland woods and fields statewide except in the Bluegrass region.
• Creeping bush clover (*L. repens*) frequent, open woods, statewide.
• Korean clover (*K. stipulacea*) see cultivated hosts, above, known SRH.
• Round-headed bush clover (*L. capitata*) rare, Mississipian plateau.
• Silky lespedeza (*L. cuneata*) Asian native escaped from conservation projects.
• Trailing bush clover (*L. procumbens*) common, open woods and fields, statewide.
• Virginia lespedeza (*L. virginica*) common, roadsides and prairie patches, statewide.
• Butterfly pea (*Clitoria mariana*) uncommon, in open upland woods, statewide except in the Bluegrass region. Spurred butterfly pea (*Centrosema virginianum*) may also grow here.
• Crown vetch (*Coronilla varia*) see cultivated hosts, above.
• Kudzu (*Pueraria montana*) common invasive to forest edge, statewide,
known SRH.
• Lupine (*Lupinus perennis*) wild native lupine, also cultivated.
• Tick-trefoils (*Desmodium spp.*).
• Hoary tick-trefoil (*D. canescens*).
• Naked-flowered tick-trefoil (*D. nudiflorum*) common, in woods, statewide.
• Panicled tick-trefoil (*D. paniculatum*).
• Pointed-leaved tick-trefoil (*D. glutinosum*).
• Round-leaved tick-trefoil (*D. rotundifolium*).
• Sessile-leaved tick-trefoil (*D. sessifolium*).
• Tick-trefoil, Sticktights (*D. perplexum*) abundant, in fields, roadsides, statewide.
• Vetch (*Vicia spp.*).
• Wood vetch, Carolina vetch (*V. caroliniana*) common, moist woods, abundant in the east.
• Hairy vetch (*V. villosa*) see cultivated hosts, above.
• Spring vetch (*V. sativa*) see cultivated hosts, above.
• Wild bean (*Phaseolus polystachios*) uncommon, moist woods, more common in the east.
• Yellow sweet clover (*Melilotus officinalis*) see cultivated hosts, above, known SRH.

This list was derived from the November 26, 2004 list published by the USDA Office of Pest Management and Policy with additional notes from the Indiana soybean rust host list compiled by Shaner and Thompson at http://www.ppdl.purdue.edu/ppdl/SBR/SBR_hosts.htm. For more information on identification of Kentucky native plants, consult Wildflowers and Ferns of Kentucky by Barnes and Francis and The Wildflowers and Ferns of Kentucky by Wharton and Barbour.

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