



# Kentucky Fruit Facts

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

February 2001 (02-01)

John Strang, Editor, Marilyn Hooks and Karen Shahan, Staff Assistants

Fruit Facts can be found on the web at: <http://www.ca.uky.edu/HLA/fruifact/>

## Fruit Crop and Weather Situation

So far the lowest temperatures recorded this winter according to the National Weather Bureau were 0°F in Covington and Henderson on January 21 and January 3 respectively. A few growers have noted some minimal losses of peach buds on tender varieties, but the 2001 fruit crop still looks good.

Keep a close watch on orchard vole populations and treat where necessary. Several surrounding states have reported high vole activity.

This year's annual Fruit and Vegetable Grower's meeting was the biggest one yet. Liz at the registration desk recorded 466 attendees.

## Coming Events

**Feb. 6 - Blackberry and Raspberry Production**, Menifee County Extension Office, Frenchburg, KY Contact David Cooper 606/768-3866.

**Feb. 8 - Small Fruit Opportunities**, Irvine, KY. Contact Eric Baker 606/723-4557.

**Feb. 9 - Northern Piedmont Specialty Crops School**, Ramada Inn, Exit #204 off I-85, Oxford, NC. Presentations will include specialty pepper, heirloom tomato, eggplant, greens, basil Chinese cabbage, strawberry, and sweet corn marketing, raspberry and blackberry production and a variety update, the basics of trickle irrigation and fertigation, and asparagus varieties Contact Carl Cantaluppi 919/603-1350, e-mail [carl\\_cantaluppi@ncsu.edu](mailto:carl_cantaluppi@ncsu.edu)

**Feb. 17-20 International Dwarf Fruit Tree Association Annual Conference**, Amway Grand Plaza Hotel, Grand Rapids, MI. Contact Jean Morris 717/677-6116 Ext. 1; e-mail: [sjm4@psu.edu](mailto:sjm4@psu.edu); web site: [www.idfta.org](http://www.idfta.org)

**Feb. 21 - Grape Pruning for Young Vines, Demonstration**. 1:00 PM, Contact Gary Hamilton 606/674-6121.

**Feb. 28 - Fruit Tree Management and Pruning Demonstration**. 1:00 P.M. Henderson, KY. Contact Tom Brass 270/826-8387.

**Feb 29. Fruit Tree Pruning and Grafting Demonstrations**, London, KY Contact Glen Williams 606/ 864-4167.

**Mar. 6 - Apple Grafting Demonstration**, Pineville, KY. 7:00 p.m. Contact Stacy White, 606/337-2376.

**Mar. 7 - Fruit Tree Pruning Demonstration**, Bob Sizemore's orchard, 10:00 A.M., Pineville, KY. Contact Stacy White, 606/337-2376.

**Mar. 6-7 - Illinois Small Fruit and Strawberry Schools**, Holiday Inn, Mt. Vernon, IL. Blackberries, blueberries and raspberries will be featured on March 6, while March 7 will be devoted to strawberry plasticulture and matted row production. Contact Jeff Kindhart 618/695-2444.

**Mar. 13 - Apple Pruning Demonstration and Blackberry and Raspberry Production**, West Liberty, KY. Contact Chris Lindon 606/743-3292.

**Mar. 15 - Grape Production.** Manchester, KY (Clay County), 6:00 P.M.. Contact Jeff Casada 606/598-2789.

**Mar. 16 - Blackberry and Raspberry Production and Apple Tree Grafting Demonstration.** Russell County Extension Office, Russell Springs, KY. 6:00 P.M. CST, Contact Raymond Thompson or Wanda Miick 270/866-4477.

**Mar. 20 - Fruit Pruning Demonstration,** Yvon Allen's, Rowdy, KY. (Perry county) 9:00 A.M., Contact Charles May 606/436-2044.

**Mar. 24 - Kentucky Vineyard Society Grape Pruning Demonstration,** Steve Isaac's Vineyard, Versailles, KY. Contact Patti Savage 859/873-4601.

**Mar. 31 - Kentucky Vineyard Society Grape Pruning Demonstration, David House's Vineyard,** Alvaton, KY (Warren County). Contact Michelle Johnson 270/842-1681.

**Mar. 31, May 19, Jul. 21 - Beginning Beekeeping Classes,** Kentucky State University Farm, Frankfort, KY. This is a 3-part series offered for those that are interested in beekeeping. Classes are free and will begin at 1:00 P.M.. Contact Tom Webster 505/597-6365.

**Apr. 5 - Commercial Apple IPM and Grape Meeting.** Research and Education Center, Princeton, KY. Contact John Strang 859/257-5685.

**Apr. 10 - Grape Pruning Demonstration,** Somerset, KY. Contact Beth Galloway 606/679-6361.

**Apr. 28 - Kentucky Nut Growers Association Spring Meeting,** Elizabethtown Extension Office, Elizabethtown, KY. Contact Tom Evans 270/826-8953.

**Jun. 6 - Commercial Apple IPM and Grape Meeting.** Burlington, KY. Contact Boone County Extension Office 859/586-6101 or John Strang 859/257-5685.

**Jul. 24 - Commercial Apple IPM and Cider Sanitation Workshop,** Jackson's Orchard, Bowling Green, KY. Contact Michelle Johnson 270/842-1681 or John Strang 859/257-5685.

**Jan. 7-8, 2002 - Annual Kentucky State Horticultural Society, Kentucky Vegetable Growers Association and Kentucky Grape and Wine Short Course meeting.** Holiday Inn North, Lexington, KY. Contact John Strang 859/257-5685.

## Apple Cider Processing Rules Finalized by the FDA

John Strang, Extension Horticulturist

The Food and Drug Administration (FDA) finalized the rules for juice processors on January 18. Small cider producers that sell their product directly to the public are not required to implement Hazard Analysis

Critical Control Point (HACCP) practices. However, if the small cider producers sell their juice wholesale they must employ a HACCP plan and achieve a 100,000 fold (five-log) pathogen reduction in their finished product. Small cider producers that do not use a process to obtain a five-log pathogen reduction must continue to use warning labels on their cider.

Processors and companies that wholesale juice must employ HACCP practices in their production facilities. They must achieve a five-log reduction based on microbial levels in the unprocessed juice in their most resistant pathogen numbers during processing. The HACCP program involves analyzing the juice processing process to determine where hazards can occur. Where hazards are present, processors are required to implement control measures to prevent, reduce or eliminate these problems. The HACCP process involves keeping records at critical stages during processing.

Large companies must implement the HACCP programs within one year, small companies (less than 500 employees) must implement HACCP programs within two years and very small companies (total sales less than \$500,000) must implement HACCP programs within three years.

## National Standards for Organic Food Published

Susan McAvoy, USDA

On December 20 the final national standards for the production, handling, and processing of organically grown agricultural products were released. These standards finalize the national definition for the term "organic" and ensure that consumers can be confident in knowing what they are buying. For farmers, these standards create clear guidelines on how to take advantage of the exploding demand for organic products. For the organic industry, these standards provide an important marketing tool to help boost exports since trading partners will now deal with only one national standard rather than multiple state and private standards.

The new organic standards detail the methods, practices and substances that can be used in producing and handling organic crops and livestock, as well as processed products. It establishes clear organic labeling criteria, and specifically prohibits the use of genetic engineering methods, ionizing radiation, and sewage sludge for fertilization.

All agricultural products labeled organic must originate from farms or handling operations certified by a state or private agency accredited by the USDA. Farms and handling operations that sell less than \$5,000 per year of organic agricultural products are exempt from certification. Farmers and handlers have 18 months to comply with the national standards.

The final standards include several changes from the proposed rule issued in March—

- Enhanced market incentives for organic products by making product content requirements stricter before the term organic can be used on the main label, including, changing the percentage of organic ingredients in products labeled , “Made with Organic Ingredients” from at least 50% to at least 70%.
- Providing better information for consumers by allowing manufacturers to state the exact percentage of organic ingredients on the principal display panel.
- Providing greater flexibility for organic farmers by simplifying requirements for composting manure.
- Incorporating industry standard practices by allowing wine produced with sulfur dioxide to be labeled “made with organic grapes” and adopting 5% of the EPA pesticide tolerance as the pesticide residue level above which a product cannot be sold as organic.

Questions concerning the Kentucky Organic Certification should be directed to Hope Crain, Kentucky Organic Program Coordinator, Division of Markets, Kentucky Department of Agriculture  
Phone: 502/564-4696; e-mail:  
hope.crain@kyagr.com

## **Kentucky Farm Bureau Certified Roadside Farm Market Program**

J. K. Henshaw, Director of Commodity Relations

Bringing more customers to your market is the purpose of Kentucky Farm Bureau’s Certified Roadside Farm Market Program. By collectively advertising we can help you reach more customers for your market for a fraction of the cost of advertising individually.

With the attention the Roadside program receives each year, it is an excellent opportunity to promote your market in new areas as well as close to home. Services provided last year included full-page color advertising; internet listings at <http://www.kyfb.com>; 60,000 roadside brochures distributed across the state; up to \$100 used for cost-share advertising per market; four TV roadside commercials for markets were run on local cable stations; a full page add was placed in the August/September edition of the Country Register; and individualized press releases were prepared for each market and mailed to 55 media outlets. We plan to offer similar programs this year.

This season we are looking for more opportunities to work with each member market, targeting local media outlets for promotion. All of these services are available to members of the Certified Roadside Farm Market Program at a cost of \$250 per market per year.

If you have an interest in expanding your customer base and increasing sales and would like

more information, please call me by February 23 at 502/495-5106.

## **Kentucky Department of Agriculture Pesticide Disposal Program**

Kentuckians can work with the Kentucky Department of Agriculture’s chemical collection program to dispose of farm chemicals safely. The KDA now has two collection facilities, one at the Bluegrass Army Depot near Lexington and the other at the Environmental Resources Center in Marshall county. The chemical collection program helps growers dispose of outdated pesticides, keeps pesticides from being disposed of improperly and avoids environmental contamination. This service is free to Kentucky farmers. All a farmer has to do is call and make arrangements for the pesticides to be picked up. For more information, call the Division of Pesticides toll-free at 800/205-6543.

## **Blueberry Cultivar Trial Results**

Dwight Wolfe, Horticultural Research Specialist and Jerry Brown, Extension Fruit Specialist Emeritus

The blueberry is a fruit crop that is native to North America. At present, Kentucky has a small established commercial blueberry market and an excellent potential for local sales, U-pick and home use. This report updates earlier results reported in the previous issues of Fruit Facts on the blueberry cultivar trial established in the spring of 1993, at the UK College of Agriculture Research and Education Center, Princeton, KY.

This plot consists of eight cultivars spaced 4 feet apart within each row and 14 feet between rows. The pH was reduced from above 6 to 5.4 with elemental sulfur prior to planting. The planting is mulched yearly with sawdust and trickle irrigated with 1 gph vortex emitters. During the last week of May the planting is covered with netting and fruit is harvested from the first week of June through the first week of July.

Cumulative yield from 1995 thru 2000, the 2000 yield, and average percent fruit ripe by the end of the 2<sup>nd</sup> and 4<sup>th</sup> week of June, for the years 1995 through 2000, are shown in Table 1. Duke and Sierra have produced the most fruit to date. Duke has also been the earliest ripening cultivar in our planting with 23.4% of Duke’s fruit ripening during the first week of June. Sunrise also ripens early with 16.0% of its fruit ripening during the first week of June. Relatively little harvest is done for the other cultivars until the 2<sup>nd</sup> week of June. Harvest is completed for all cultivars by the end of the 4<sup>th</sup> week of June. The one exception is Nelson, which is picked through the first

week of July.

These results can be useful to growers in selecting blueberry cultivars. Labor peaks and harvest periods that conflict with production and/or harvest of other crops may have to be evaluated with respect to cultivar yields. Another factor one may

also want to consider in selecting a cultivar is berry size (Table 1). Berry size may vary from the size of a pea to the size of a cherry. Small berries are often preferred for cooking, while large ones are typically preferred for fresh use.

Finally, one may also wish to consider how easy or difficult it is to pick a particular cultivar.

Harvesters at Princeton rated the cultivars from easiest to hardest to pick as: Toro, Duke, Sierra, Sunrise, Bluecrop, Bluegold, Nelson, and Patriot.

This article describes the results from the first five harvests from this planting and will be updated periodically.

**Table 1. Blueberry Cultivar Trial<sup>1</sup>**

UK Research & Education Center, Princeton, KY

Cultivar	Cumulative yield (lbs/bush)	2000 yield (lbs/bush)	Average % ripe fruit at end of week in June, for years 1995-2000		Berry Size (grams/berry) <sup>2</sup>
			2nd	4th	
Duke	43.9	11.4	61.7	94.8	2.2
Sierra	42.6	13.8	36.2	92.5	2.1
Nelson	37.9	15.7	12.1	66.8	2.3
Toro	37.4	14.4	31.7	80.1	2.6
BlueGold	36.0	11.3	38.1	81.8	1.9
Bluecrop	35.9	11.2	32.0	81.3	2.1
Sunrise	25.4	7.6	59.7	96.0	2.1
Patriot	21.6	5.4	54.1	94.1	2.2
Lsd (0.05)	4.2	1.9	5.4	2.4	0.1

<sup>1</sup>The planting was established in April, 1993. Plant spacing is 4 feet between bushes in rows 14 feet apart. There are three bushes per cultivar-rep combination.

<sup>2</sup> There are 28.3 grams per ounce.

## Managing Strobilurin Fungicide Resistance in Fruit Crops

John Hartman, Extension Plant Pathologist

Fruit growers in Kentucky are beginning to use a new class of fungicides to manage a variety of fungal diseases. These fungicides, called strobilurins can be effective and long-lasting tools for crop production provided fungal pathogens do not develop resistance to the fungicides.

### Origin and impact of strobilurin fungicides:

Strobilurins are derived from a natural anti-fungal

compound that occurs in a small mushroom, *Strobilurus tenacellus*, which grows on fallen pine cones in Europe. The original compound has been modified in different ways to make it more stable and more effective as a fungicide. They have very low toxicity to birds, earthworms, beneficial insects, predaceous mites, and mammals (including humans). They break down quickly in soil but have good residual activity on foliage and fruit. Consequently, strobilurins are considered reduced-risk fungicides.

Examples of strobilurin fungicides. There are three strobilurins labeled for fruit crop use,

azoxystrobin, trifloxystrobin, and kresoxym-methyl. These products are listed in our Kentucky commercial fruit spray guides (ID-92, ID-94).

Strobilurin crop uses are expanding, so this list will likely grow to include stone fruits and other crops

by the next growing season. More strobilurins (e.g., pyraclostrobin) are being developed. Growers need to be aware that the efficacy of strobilurin fungicides against certain fungi varies from one crop to another. Sometimes, different species of the same fungus, or related fungi are insensitive to strobilurins; this should not be confused with fungicide resistance.

Chemical	Trade Names	Crop Usage	Diseases Managed
azoxystrobin	Abound	<b>grapes</b>	several fungi, see spray guide
	Heritage	turf and ornamentals (greenhouse, outdoors)	downy and powdery mildews, Botrytis, several root rots
	Quadris	tomatoes, potatoes, selected cucurbits	several fungi, see spray guide
trifloxystrobin	Compass	ornamentals (greenhouse, interiorscapes, nurseries)	rust, scab, powdery and downy mildews, Botrytis
	Flint	<b>apples, grapes</b> , selected cucurbits	multiple fungi, see spray guide
kresoxym-methyl	Cygnus	ornamentals (greenhouse)	powdery mildew
	Sovran	<b>apples, grapes</b>	multiple fungi, see spray guide

Mode of action of strobilurin fungicides.

Strobilurins are active against a wide array of plant pathogenic fungi, generally at fairly low rates. They work by inhibiting a single biochemical pathway involved in mitochondrial respiration in fungal cells. Mitochondria are the energy-producing units within cells, so disrupting mitochondrial function results in death of the fungal cells as they run out of energy.

Strobilurins are excellent protectant fungicides because they inhibit spore germination. The strobilurins are powerful antispore germinants. If applied too late to protect, they allow lesions to develop but few secondary spores form on these lesions. This is significant for diseases such as powdery mildew and apple scab where the most damage is caused by infections from secondary spores that develop from previously infected leaves. They have strong protectant and antispore germinant activities because they are primarily retained in the waxy plant surface cuticle. This means that they are more rainfast than traditional protectants and, although they don't redistribute very well from leaf to leaf in rainwater, they do redistribute well within the waxy layers of a given leaf (or fruit).

Strobilurins have trans-laminar activity. A few days after spraying, enough fungicide diffuses from the sprayed leaf to the unsprayed side to provide protection against fungal plant pathogens. This pattern of fungicide movement is unique to the strobilurins, and different manufacturers have devised their own trademarked names to describe it,

e.g., "surface systemic" and "mesosystemic." Nevertheless, in the early season, as new growth is developing, repeated fungicide applications are still required because of the need to cover new tissues as they emerge.

The strobilurins generally are not as effective in a "kickback" or "curative" mode as are compounds with a higher degree of systemic activity, such as sterol inhibitors like Nova and Rubigan. Apple scab, however, may be an exception to this general rule because the apple scab fungus grows just beneath the cuticle. Just enough fungicide may actually "leak through" the underside of the cuticle to do the job.

Managing strobilurin fungicide resistance.

Because strobilurins inhibit a single biochemical step, resistant pathogen strains will develop when the fungi use a new pathway that bypasses the step blocked by strobilurins. Resistance to strobilurins already exists in powdery mildew in Europe and Asia, as well as in Botrytis of greenhouse crops. When fungi develop resistance, resistant isolates are virtually immune to the strobilurins. They multiply rapidly unless stopped by another fungicide. A strain resistant to one strobilurin will be resistant to all. Growers must incorporate resistance management into plans for using strobilurin fungicides.

Fungicide use directions printed on the

Official Business  
Penalty for Private Use, \$300

manufacturers' labels incorporate fungicide resistance management principles. For example, for most crops, no more than four sprays of any strobilurin may be used per season. A strobilurin fungicide can be used no more than three times in a row (two would be better). If two or three sequential applications are made, an unrelated fungicide must be used in the next two applications before strobilurin use can resume. Note that tank-mix combinations are not part of the anti-resistance strategy. Use of reduced rates, common in tank mixes, increases the possibility of fungicide resistance. The recommended resistance management strategy minimizes the selection of resistant strains by limiting the number of selection events (sprays) and it limits the opportunity for resistant strains to multiply by using unrelated fungicides in rotation. It is important that fruit growers pay heed to the possible buildup of resistant fungus strains.

Be aware of potential phytotoxicity. Strobilurin fungicides can be phytotoxic to some fruit crops. For example, azoxystrobin is phytotoxic to certain apple varieties (e.g., MacIntosh, those with MacIntosh parentage, and Gala), even at very low concentrations resulting from drift or spray tank residue. Kresoxym-methyl is phytotoxic to a few sweet cherry varieties i.e., all of the foliage on some varieties can be killed if trees are sprayed directly with the chemical. Trifloxystrobin is phytotoxic to Concord grapes when applied directly, and is specifically not labeled for use on that variety. Thus, each of these strobilurins has a problem with phytotoxicity to a few varieties of one specific crop. In Kentucky many of our fruit growers also grow some vegetables or ornamentals and may be using the same sprayers for both. Growers need to be alert to potential phytotoxicity problems.

## 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, in the To: line of your e-mail message type "majordomo194@ca.uky.edu". In the Subject: line type "Fruit Facts". In the message body, enter the following two lines (nothing more!):

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subscribe fruitfacts  
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You should receive confirmation by return e-mail. If you have a problem, or if you wish to communicate with a person about "fruitfacts", the owner's address (the To: line of the message) is: owner-fruitfacts@ca.uky.edu

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John Strang, Extension Horticulturist

