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## *Crop Conditions*

FFF 98-01  
March 10, 1998

The 1997-98 season is upon us and the main topic of conversation is the weather. El Nino provided a very mild winter across the Midwest with minimum temperatures barely reaching the single digits in the coldest parts of the state. January and February were much warmer than normal which has caused plants to break dormancy much earlier than normal. The danger of this early plant development is that cold weather may follow and cause substantial injury to fruit buds, resulting in low yields. The balmy 60 degree temperatures of the past weekend were replaced by a blizzard on Monday, and lows in the lower teens this morning. Temperatures are predicted to fall into the single digits to teens across the state over the next few days. This almost certainly will lead to damage on fruit crops in some areas, but the extent of the damage is difficult to predict. The major variable is the stage of development of the crop at this time. The small fruit crop most vulnerable to cold damage will be brambles (raspberries and blackberries), which have responded quickly to the warm temperatures of the past few weeks and are at budbreak, making them susceptible to injury if temperatures drop much below 20°F. Grapes are at early swell in the southern part of the state, and dormant in central and northern areas. Some damage may occur on early budding varieties. Blueberries have swollen buds in northern and central areas, and are at early budbreak in the south. They are fairly tolerant of cold temperatures, but some damage is likely on early varieties. Strawberries are still relatively dormant and, if still covered by straw mulch, should be able to tolerate the cold temperatures. - *Bruce Bordelon*

Well, after coming from New Zealand and having spent my first full winter here, I can't see what all the fuss is about with the cold! Obviously, up until this point, there has been practically no winter damage to trees or buds. In his many years of fruitgrowing experience, Herb Seiler in Spencer County said that he had never before got to this time of the year without finding any dead buds on peaches. All that could change in the next few days however. As I write this, it is snowing and about 30° in Lafayette, but with minimum temperatures as low as single digits forecast for the next few days. The low temperatures we are expecting over the next few days are not restricted to Indiana. Temperatures into the 20's are forecast for South Carolina, Georgia and even the Florida panhandle, so the damage there could be severe. In the central to northern part of the state, trees are still pretty dormant, so temperatures in the teens may cause some damage to peaches, while apples should be OK. But in the more southern parts of the state, the situation doesn't look so good. The season is more advanced in the south, with plums and apricots flowering about 2 weeks ago. The last few days, temperatures have been in the 60's and even into the 70's, which will have pushed bud development along and decreased hardiness. Peaches are showing pink. With temperatures in the teens called for, there are a lot of nervous people, and the damage could be severe. We will obviously know much more about this a week from now, but the situation does not look good. At least we know going into this, that we have pretty much 100% live buds, so we can stand to lose some. Look in the next issue of Facts for Fancy Fruit for an update. - *Peter Hirst*



**Critical Temperatures:** There is a threat of frost or freeze damage anytime after plants have broken dormancy and buds begin to grow. The level of cold that fruit buds can take varies by species and stage of growth. The tables below give the critical temperatures for various fruit crops at different stages of development. Though many environmental factors can influence the actual critical temperatures, these data give a good estimate of the temperatures at which to expect injury. To determine cold injury, cut branches after the cold event and warm them at room temperature for 24-48 hrs before cutting buds to inspect for browning.

**Critical Temperatures for Flower Buds:  
Apples\***

Bud Development Stage <sup>a</sup>	1	2	3	4	5	6	7	8	9
Ave. Temp. for 10% Kill	15°F	18	23	27	28	28	28	28	28
Ave. Temp. for 90% Kill	2	10	15	21	24	25	25	25	25

\*For Red Delicious, Golden Delicious and Winesap approximately 1 degree hardier; Rome Beauty, 2 degrees hardier; except after petal fall, when all varieties are equally tender.

<sup>a</sup>Bud development stages are: 1=Silver Tip, 2=Green Tip, 3=Half-Inch Green, 4=Tight Cluster, 5=First Pink, 6=Full Pink, 7=First Bloom, 8=Full Bloom, 9=Post Bloom.

**Peaches\***

Bud Development Stage <sup>a</sup>	1	2	3	4	5	6	7
Ave. Temp. for 10% Kill	10°F	21	23	25	26	27	28
Ave. Temp. for 90% Kill	1	5	9	15	21	24	25

\*For Elberta.

<sup>a</sup>1=First Swelling, 2=Calyx Green, 3=Calyx Red, 4=First Pink, 5=First Bloom, 6=Full Bloom, 7=Post Bloom. (From Washington State University Extension Information.)

**Grapes\***

Bud Development Stage <sup>a</sup>	1	2	3	4	5	6
Ave. Temp for 10% kill	Varies	13°F	21	25	27	28
Ave. Temp for 90% kill	Varies	-3	10	16	21	22

\*For Concord

<sup>a</sup>1=Dormant, 2=First swell, 3=Full swell, 4=Bud break, 5=1st leaf, 6=2nd leaf.

**Strawberries**

Bud Development Stage	Buds Emerge	Buds Closed	Flower Open	Small Green Fruit
Ave. Temp for 90% kill	10°F	22-27°F	30°F	28°F

Duration of temperature for damage can be 20 minutes to 2 hours, depending on wind, humidity, and cultivar.

**Other Fruits:** Blueberries are more tolerant of spring frosts than most other fruit crops. Open flowers are not usually injured unless temperatures reach the low to mid 20's. Brambles are also relatively tolerant of spring frosts and freezes, partly because the flower buds are not exposed until a few weeks after budbreak. However, brambles are one of the earliest fruit crops to bud out and are frequently damaged by freeze events. ID-168, the Indiana Commercial Tree Fruit Spray Guide contain a chart that describes the floral development stage and critical temperatures for several tree fruit crops not listed above. We'd like to hear from growers next week about the amount of damage that occurs. Call or email us at the numbers listed at the end of the issue.



**Cider Update:** We seem to be continually saying that we'll know more about the final FDA regulations in the next few months. The proposal on HACCP is still working it's way through Washington, and is expected to be published in the Federal Register within the next 3 months. The final rule will not be published until after a comment period and the review of those comments. Dr. Dane Bernard, Vice President of the National Food Processors Association says that the notice and comment period can take months to a year or more if there are contentious issues.

**UV Pasteurization of Cider:** Engineers in Rochester, NY have developed a system that pasteurizes apple cider using UV light. They have been working with Cornell University food safety specialist Dr. Randy Worobo who said that "The new design for a UV pasteurization unit should be perfect for small cider producers." It is about one-quarter of the price of a thermal pasteurization unit, small, economical to run, and very user-friendly.

## Coming Meetings

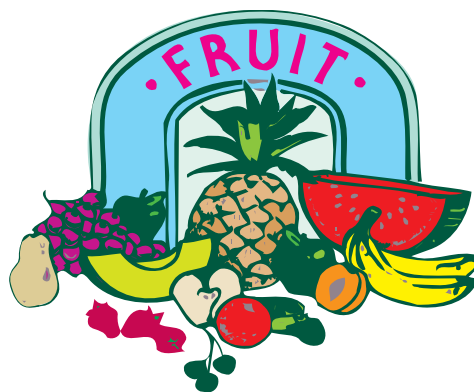
**March 13-15** — Indiana Grape/Wine Symposium. Bloomington Convention Center. Contact Steve Thomas 800-948-8466.

**March 26** — Southeast Indiana Fruitgrowers twilight meeting. 7.00 pm, Farm Bureau Building, Aurora. Contact Karen Witt, phone 765-647-3511

**March 28** — Pruning demonstration, Rocky Meadow Orchard and Nursery, 1.00 pm. Contact Ed Fackler, phone 812-347-2213

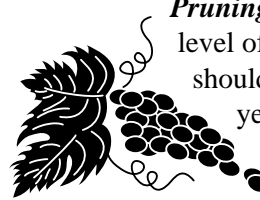
**April 8** — East Indiana Fruitgrowers twilight meeting. 6.00 pm, Minnetrista Cultural Center, Muncie. Commerical roundtable discussion at 3.00 pm. Contact Harold Brown, phone 765-747-7732

**May 18** — Twilight meeting, 6.30 pm. LaPorte County. Contact Walt Sell, phone 219-326-6808 ext. 271



Tests have shown that this particular design reduced *E. coli* O157:H7 contamination from 100,000 microorganisms per ml to 1 organism per ml in a single pass. Apparently this unit is very easy to set up and only needs to be wheeled into place and plugged in to be operational. The unit is in the final set of confirmation tests to ensure that it is as effective as heat pasteurization in killing pathogens. Studies are currently being carried out at Cornell to test the taste and nutritional status of cider treated using this method, although preliminary tests have indicated that UV light causes no sensory changes to the cider. The manufacturers have applied for a patent and have said the unit could sell for as little as \$6000. At this stage it is unclear whether all the necessary tests will be completed in time to make this piece of equipment available for the coming cider season.

The above is not intended as an endorsement of this unit, but to inform growers of a potentially useful technology.



**Pruning Grapes:** Though the level of winter injury in grapes should be negligible this year, growers must still be concerned about the possibility of bud injury from late freezes and frosts. A pruning technique called 'long pruning' or 'double pruning' can help avoid spring frost and freeze damage, especially on varieties that tend to bud out early. The procedure works because the first buds to begin growing are those on the tip of the canes while buds closer to the base begin growth later, a phenomenon called apical dominance. To perform long pruning, select canes to be used for fruiting spurs during the normal pruning practice, but leave these canes long, with 10-15 more buds than desired. Spurs are normally pruned to 5-8 nodes for fruiting, but if they are not cut back, then the extra buds will help delay the development of the desired basal 5-8 buds which helps avoid frost injury. After the date of the last probable spring freeze has passed, the canes are shortened to the desired length to properly adjust the bud load for the vine. This type of pruning is only applicable to spur pruned or 'no tie' training systems. Growth of the basal buds can be delayed by as much as two weeks during normal weather conditions, but may have little effect in a

unusually warm spring. While this procedure requires an extra trip through the vineyard, it can mean the difference between a full crop and little or no crop.

**Pruning Brambles:** This is a good time to finish pruning summer-bearing brambles. Last years fruited canes should be removed now if they were not last summer or fall. Laterals on blackberries, and black and purple raspberries should be trimmed back to about 2/3 to 3/4 of their original length to promote flowering on strong wood. Red raspberries canes can be tipped if desired, but should not be tipped more than 1/4 of the cane length. If the planting is trellised, the canes should be tied to the wires now before growth starts. Fall bearing types should be mowed to the ground before growth begins.

**Subscription Notice:** If you subscribe to the printed version of Facts for Fancy Fruit, check the mailing label on this issue. If there is a '97 in the corner, we have no record of your payment for 1998, and you will not receive another issue of the newsletter. If you wish to continue to receive this newsletter, please fill out the subscription form attached to this issue and send with a check for \$12.00 payable to Purdue University, to: 'Facts for Fancy Fruit', 1165 Horticulture Building, Purdue University, West Lafayette, IN 47907-1165. If you feel there is an error, please contact Karen Cooper at (765) 494-1301. If you have e-mail and would like a copy sent electronically, send us your e-mail address and we will include you on the list, or subscribe through the web at <http://www.hort.purdue.edu/fff/fff.html>.

**1998 Spray Guides:** The revised 1998 Tree Fruit (ID-168) and Small Fruit and Grape (ID-169) Spray Guides are now available. The new issues contain the latest pesticide label information available at printing time but, as always, you should read and follow the label directions. Several changes have occurred this year and all commercial growers should have a copy of the revised versions. The spray guides will be available at the regional meetings, through your local Cooperative Extension office, or directly from Agricultural Communication Service, Media Distribution Center, 301 South 2nd Street, Lafayette, IN 47905-1092. 1-888-EXT-INFO. (1-888-398-4636)

**FACTS FOR FANCY FRUIT  
SUBSCRIPTION NOTICE FOR 1998**

Facts for Fancy Fruit is a newsletter for commercial and/or advanced amateur fruit growers. It provides timely information on pest control and production practices that should be of interest to all growers. The information is not geared for home fruit growers unless those growers wish to follow commercial practices. All growers or interested persons are welcome to subscribe, however.

At least 14 issues will be published during 1998, bi-weekly during the growing season and monthly otherwise. The subscription price of \$12.00 includes only the basic costs of printing and mailing at first class rates. The newsletter is also available electronically through the world wide web at <http://www.hort.purdue.edu/fff/fff.html> or by email. If you have e-mail and would like a copy sent electronically, send us your e-mail address and we will include you on the list, or subscribe through the web at <http://www.hort.purdue.edu/fff/fff.html>.

If you wish to receive the printed version of the newsletter in 1998, please fill out the form below and send it to the Department of Horticulture and Landscape Architecture, along with a check for \$12.00 (tax included) **made out to Purdue University.**

We hope that you will benefit from the information contained in the newsletter. We welcome your comments and suggestions.

Bruce Bordelon

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Please send me "Facts for Fancy Fruit" for the 1998 season. Enclosed is my check for \$12.00 (tax included). Make checks payable to PURDUE UNIVERSITY.

Name \_\_\_\_\_ Please Check:  
Address \_\_\_\_\_ \_\_\_\_\_ Grower  
City \_\_\_\_\_ \_\_\_\_\_ Sales  
State \_\_\_\_\_ Zip \_\_\_\_\_ \_\_\_\_\_ Other  
Phone# \_\_\_\_\_ County \_\_\_\_\_

I would like to see information on the following fruit crops:

\_\_\_\_\_ Apple      \_\_\_\_\_ Peaches      \_\_\_\_\_ Pears  
\_\_\_\_\_ Blueberries      \_\_\_\_\_ Strawberries      \_\_\_\_\_ Grapes  
\_\_\_\_\_ Raspberries      \_\_\_\_\_ Cider      \_\_\_\_\_ Other

Please Return to:      Facts for Fancy Fruit, Purdue University,  
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