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FFF 97-12

September 4, 1997

## CROP CONDITIONS

Fruit crops are still about 7 to 10 days behind normal this season. Mid season peaches are tailing off in the southern part of the state, with full crops being reported by some. Fruit size and quality appears to be excellent. On farm sales seem to be up markedly up from last year. Redhaves are being harvested in many central and northern locations. Crops are generally around 60-80% of a full crop, which is much better than anyone expected back in April. A little peach scab has been showing up, but this seems mostly due to a spray having been missed for various reasons. Early fall apples are in harvest in the south with Lodi already over, whereas in other parts of the state, early apples are just coming in. Grape harvest is underway in southern and central Indiana and fruit quality is very good. Fall bearing red raspberry harvest has begun. Japanese beetles continue to plague small fruit crops, especially grapes and raspberries. Another emergence occurred recently and numbers are fairly high.

**Cider, Beef and E. coli:** These are three words that have appeared in the same sentence in about every newspaper in the country over the past few weeks. Unfortunately the FDA's announcement concerning cider came hot on the heels of an illness outbreak due to consumption of tainted beef products. This meant that cider safety became hot news also.

The FDA recently announced "measures to reduce the risk of illness from disease-causing microbes in unpasteurized fruit and vegetable juices. The new strategy includes food-safety control programs for the industry, new labeling for products, and education programs for consumers and manufacturers." Although the FDA states that "The new measures affect only a small number of producers because more than 98 percent of all fruit and vegetable juices are already pasteurized" this will have a large effect on the apple cider industries in many states, which are generally based on relatively small operations producing unpasteurized cider.

William Schultz, FDA deputy commissioner for policy, said the agency later this year will propose a new rule requiring Hazard Analysis and Critical Control Point (HACCP) safety programs at all appropriate juice processing plants.

"The HACCP measures will take time to be in full effect," Schultz said. "In the interim we are asking the industry, as a voluntary public health service to their customers, to begin immediately labeling fresh apple juice and cider products with a statement of the risk."

The agency recommends that at least 3 elements be included in a warning statement:

1. a statement of the hazard - about the potential presence of

pathogens known to cause serious or life-threatening illnesses

2. a statement saying that the juice has not been specifically processed to destroy such pathogens

3. a statement identifying the group most at risk, that is, children, the elderly, and people with weakened immune systems.

Sample statements are:

**WARNING:** Unless specifically processed, some juices may contain harmful bacteria known to cause serious illness. This product has not been specifically processed to destroy such bacteria. The risk of life-threatening illness is greatest for children, the elderly and persons with weakened immune systems.

**WARNING:** Some juices have recently been found to contain harmful bacteria known to cause life-threatening illness. This product has not been specifically processed to destroy such bacteria. Children, the elderly and persons with weakened immune systems should avoid this product.

**WARNING:** This product has not been pasteurized and therefore may contain harmful bacteria known to cause serious illness in children, the elderly and persons with weakened immune systems.

The latest information from the FDA is available on the internet. Their address is: <http://www.fda.gov/fdahomepage.html>

The U.S Apple Association is strongly encouraging fresh apple cider producers to "immediately and voluntarily label their products, or provide point of purchase information with any

model statements" including the essential elements as outlined above. The U.S. Apple Association is in the process of developing a consumer leaflet which will contain this information.

Most cider producers will probably view the recent publicity as negative, but it is up to us to produce a safe product and allay the public's fears. This coming season is a critical one for our industry, and an outbreak of illness traced back to cider will do serious, long-term damage to the cider industry. So let's all do a good job at paying attention to sanitation and cleanliness right from the orchard to bottling, and hope that this year no news is good news.



**Apple Cider Research at Purdue University:** The most recent outbreak of foodborne illness by ingestion of *E. coli* O157:H7, in November 1996 in California, revived concerns for unpasteurized apple cider. These concerns, among both scientists and apple cider producers, lead to funding of a research project by Indiana's Value Added Center. The proposed research will be conducted at Purdue University, and it will attempt to develop economically feasible pasteurization methods that destroy disease-causing microbes in apple cider while retaining maximum cider quality. This will prevent public health problems, help local processors to stay in business, and give apple cider produced in Indiana greater consumer attraction. The importance of such apple cider research was supported by statements from several Indiana apple growers.

The research at Purdue University is headed by Drs. John Floros and Richard Linton of the Food Science Department, and Dr. Peter Hirst of the Department of Horticulture. The research is conducted by graduate student Lotte Dock. Ms. Dock is a Ph.D. student working under the direction of Dr. Floros. She is a native of Denmark, who came to the Food Science Department at Purdue in 1994 to finish her Masters degree. She is looking forward to working on the project and interacting with Indiana apple growers and cider producers.

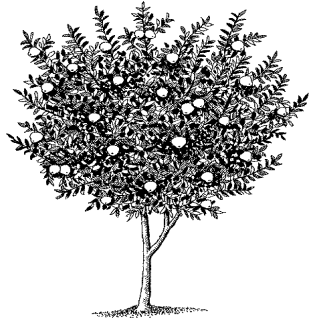
**Harvesting Apples - Mature vs Ripe:** often the terms "mature" and "ripe" are used synonymously, but in actual fact there is a subtle yet important difference between a mature and a ripe fruit. A ripe fruit is one that is ready to be consumed, so the term ripe relates to eating quality. A mature fruit on the other hand is one that has attained a stage of development on the tree so that it will ripen after harvest. Fruit should be harvested when it is mature, but not necessarily ripe. Fruit that is harvested before it is mature will not soften and develop the characteristics we associate with

good eating quality. The riper a fruit is at harvest, the shorter its potential storage life, so ripe fruit should only be harvested when it is to be sold immediately. Or in other words, the longer fruit is to be stored prior to marketing, the less ripe it should be when harvested.

So how do we tell when a fruit is mature and determine how ripe it is? There are a number of different parameters that can be used to judge fruit maturity, including starch concentration, sugar levels (% soluble solids), fruit background color, seed color, fruit taste and ethylene production by the fruit. No single parameter offers a perfect measure of fruit maturity, and some are more practical than others. For example, ethylene production by the fruit is a very good measure of physiological maturity, but requires an expensive piece of machinery called a gas chromatograph - hardly practical for an individual orchard although these are used by large co-operatives or industry wide organizations in other states and countries. Since no single parameter will give us a good measure of fruit maturity, a combination approach is best, usually taking into account the following factors:

- skin color - we are talking about background color here. For most apple varieties, the background color changes from green to yellow as the fruit matures. Experience in your area is essential here since the progression of color can be different in different areas even with the same variety. Red color is not a good indicator of fruit maturity.
- disappearance of starch. As fruits ripen, starch is converted to sugar. Starch is easily seen by applying an iodine solution to the cut surface of the fruit (starch turns dark blue/black). Usually fruit is harvested when about one quarter to one half of the fruit is clear (indicating no starch in those areas).
- Soluble solids concentration (% SS) - as fruit mature, starch is converted to soluble sugars. The levels of these soluble sugars or soluble solids can also be used as a guide, but will vary among cultivars and even from one year to the next, so setting an absolute value at which harvesting should begin is unlikely to be very useful. In general though, fruit should not be harvested below 10% SS, and 11% for sweeter varieties such as Golden Delicious, Gala and Fuji.
- Fruit firmness (FF) - as fruit ripens, it will soften from more than 20 pounds firmness to around 15 pounds. The more you allow the fruit to soften before harvest, the shorter the storage life of the fruit.
- seed color - seeds in immature fruit are white and gradually become darker as the fruit matures, eventually ending up black.

**Young Tree Care:** If you planted trees this year, they still need care and attention. In many places in the state we are getting pretty dry, and this affects young trees to the greatest extent due to their limited root system. If there is any way you can get water onto them, it will be well worth it in terms of tree growth and development, and of course getting the trees into bearing early.



**Fruit russet:** Many growers are finding some russet on apples as a result of cold damage to the flowers or young fruitlets back in April. If you are selling your fruit through your market, then if you are innovative with your marketing you should be able to sell slightly russeted fruit as usual. If slightly more damage has been sustained, then a small discount along with a description of what caused the damage emphasizing it is only cosmetic, may be called for. The obvious use for severely misshapen fruit is in cider operations.

**Summer pruning of Apples:** The main use of summer pruning is to improve light penetration into the tree which enhances fruit red color. Summer pruning is especially useful in trees which are too dense or vigorous. Good candidates for summer pruning are varieties that promise a good return for highly colored fruit (for example Gala, Fuji, Braeburn). Obviously there is little to be gained from summer pruning yellow skinned cultivars. Summer pruning is more dwarfing than dormant pruning so should only be performed on vigorous or crowded trees. Do not summer prune young trees which have not yet filled their space or trees which are low in vigor.

Summer pruning should only be carried out after the shoot tips have formed terminal buds, to avoid regrowth. In most parts of the state terminal bud set has already occurred. With mature trees, remove the current seasons shoots back to a spur or side shoot on last years wood, but limit the number of cuts on each tree. Summer pruning too hard can create sunburn problems, and can reduce fruit quality in terms of fruit size and soluble solids concentration. Excessive summer pruning may also remove too much replacement fruiting wood. Generally if trees are too dense, the time to tackle the problem is with your dormant pruning by removing a few large limbs. We'll talk more about this later in the year.

**Program Ideas for the winter meetings:** Please send Peter Hirst, Bruce Bordelon, and/or Dick Hayden your suggestions for topics or speakers for the winter meeting programs. We have a number of good suggestions, but need additional ones. The dates of the meetings are January 26-28, 1998, so mark your calendar.

## ***Coming Meetings:***

**September 14** — Ohio Valley Harvest Festival, Belvedere Plaza, Louisville, KY. Noon to 6:00 PM. Contact Roy Ballard, Floyd Co. Cooperative Extension. (812-948-5470).

**September 18** — Late Season Peach and Mid Season Apple Showcase at Southwest Michigan Research and Extension Center. Self-guided tours any time 3:00 - 6:00 PM, group discussion 6:30 PM. Contact Bill Shane (616-944-1477 x 205)

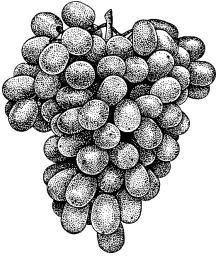
**September 18** — Kentucky State University / University of Kentucky field day on Farm Stewardship. Contact the KSU Research Farm at 502-564-5871 or 5869.

**September 28** — Central Kentucky Harvest Festival, Red Mile Race Track, Lexington KY. This festival is organized by WUKY and is set up like the Ohio Valley Harvest Festival. Contact Gail Bennett 606/257-7049 if you would like to participate and sell locally grown produce.

**October 25** — Kentucky Vineyard Society Fall Meeting, Sullivan College, Louisville, KY. Contact Butch Meyer 606/573-5642.

**November 3-5** — Blueberry Integrated Crop Management School. Kellogg Biological Station near Battle Creek, Michigan. See story above. Contact: Laurel Raines (616 429-2425), Mark Longstroth (616 657-7745) or Eric Hanson (517 355-2261).

**November 5** - Late Season Apple Showcase at Clarksville Horticultural Research Station. Contact Clarksville Station (616-693-2193).



**Grape post harvest disease control:** Growers often neglect to scout their vineyards once harvest is complete which can be a costly mistake. Downy and powdery mildews are common diseases that often build to epidemic levels on susceptible cultivars in fall. Heavy dews which form on cool nights in late summer and fall provide sufficient moisture for sporulation and spread of these fungi. Though we have a low incidence of foliar diseases this year, downy mildew is fairly widespread. A severe downy mildew outbreak can cause early defoliation which reduces winter hardiness. Powdery mildew reduces photosynthesis and the plant's ability to store adequate carbohydrates. Allowing either disease to become established greatly increases the amount of inoculum that will be in the vineyard next spring. Thus, it is important to maintain some protection against these diseases throughout the fall until leaves drop naturally.

There are a few options available for post harvest downy mildew control; captan, copper compounds, mancozeb, or Ziram. Ridomil formulations MZ 58 (Ridomil/mancozeb) and Ridomil Copper 70W are registered for use on grapes, however, it is not a good idea to apply ridomil to a well established infection because of the potential for development of fungicide resistance in the fungus. Because of its broad spectrum of activity, the newly registered fungicide Abound should be an effective post harvest tool when adequate supplies become available. Captan and mancozeb both provide excellent protection against spread of downy mildew. Copper fungicides also provide good control, but can cause phytotoxicity on certain varieties and under certain climatic conditions. Fixed coppers plus lime are the least likely to cause phytotoxicity.

There are also options for powdery mildew control. Sulfur is effective against powdery mildew, but many cultivars are sensitive to sulfur, limiting its usefulness. Sulfur should not be applied if temperatures greater than 85F are expected. Some cultivars such as Chancellor, Foch, Concord, and Cynthiana may be damaged at any temperature. Sterol inhibitors such as Nova, Bayleton or Rubigan are available for powdery mildew control on sulfur sensitive varieties. However, development of fungicide resistance in the pathogen population is a real concern with these materials and their use on existing infections is not recommended. They should be used for prevention of disease rather than eradication. JMS stylet oil is one possible alternative, but our experience with it limited so it should be used with caution. Be sure to thoroughly read the label for possible interactions with other materials, especially sulfur and captan, before using JMS oil. Never use JMS oil within two weeks of a captan or sulfur application, and vice versa. As with downy mildew, Abound should be an effective post harvest tool when adequate supplies become available.

It may not be necessary to apply fungicides post harvest. Growers should scout their plantings for problems to determine if fungicides are necessary. Cultivars differ greatly in susceptibility to the common diseases. For example, Chancellor and most vinifera cultivars are highly susceptible to both powdery and downy mildew and often require post harvest disease control. Concord and Foch are only slightly susceptible to downy mildew and moderately susceptible to powdery mildew so seldom require post harvest disease control. Other cultivars vary in relative susceptibility to diseases, and disease incidence and severity varies with the growing season. Apply fungicides only if necessary. Be sure to check for season limits on quantity of product allowed and read and follow all label recommendations. Refer to ID-169 for rates, comments, varietal susceptibility, and other valuable information.

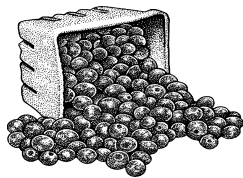
**Soil management and cover crops:** Fall is a good time for cultivating fields, adding lime and fertilizer, and planting cover crops in fruit plantings. Cover crops can be an integral part of the overall orchard floor management plan. Growers planning on establishing new orchards or vineyards next year should consider a pre-plant soil management program which includes deep subsoiling, soil pH adjustment and addition of fertilizer, especially P and K, according to soil test recommendations, and planting cover crops. Cover cropping a site the year before planting is an excellent way to increase soil organic matter content and control weeds. Several cover crops are available for fall planting, and mid to late September is the time to plant in most areas of the state. A favorite among growers is winter rye because it performs very well under Indiana conditions. Rye not only adds large amounts of organic matter to the soil, but also suppresses the development of many annual and perennial weeds. It should be grown until it begins to head-out in the spring then treated with post emergent herbicides or incorporated into the soil mechanically. When the cover crop is killed with post emergent herbicides, the residue can be left on the surface to provide a mulch layer which will suppress weeds, help conserve moisture, increase organic matter, and improve soil structure. Dormant fruit plants or vegetable transplants can be set directly into the mulch. There are several other cover crops for fall and spring planting and choices depend on the grower's specific preferences and needs.

**Nursery Stock:** If you plan to plant a fruit planting next spring, the time is running short to order plants from nurseries. Most nurseries take orders in winter or spring for the following season, giving them a year to propagate the needed plants. At this time nurseries will only have available plants that they have not already committed to another grower. Make your orders soon for planting next spring.

**Perennial weed control:** Late summer and fall is an excellent time to control troublesome perennial weeds by spot spraying with suitable herbicides. Perennial weeds tend to become established within the rows in fruit plantings because they are not fully controlled by the normal weed control program. Once established, these plants can be difficult to eliminate. Fall is a

particularly good time to control perennial weeds with glyphosate (e.g. Roundup). As perennial plants begin to slow growth and harden off for winter, carbohydrates are transported to the roots for storage. Fall applied systemic herbicides will be similarly transported to the root system which leads to excellent control. Fall application works equally well on hard to control herbaceous perennial weeds such as thistle, dock, smartweed, and morning glory, as well as woody perennials such as poison ivy, Virginia creeper, multiflora rose, mulberry, blackberry and so on. The plants do not have to be actively growing for good results but should have sufficient active leaf area to take up the herbicide. Check the manufacturers product label for specific recommendations. NOTE: Desirable crop plants are also translocating carbohydrates to the roots and can be severely injured by fall applied systemic herbicides. Be extra careful when spot treating to AVOID ANY CONTACT with desirable plants. Read and follow all label recommendations.

**Fall herbicides for fruit crops:** There are several advantages to fall applications of pre-emergent herbicides in fruit crops. Dry soil conditions in the fall allow for equipment travel without compaction, weather conditions are more stable giving the grower greater flexibility in application times, and there is less likelihood of heavy rains to cause runoff. Fall applications provide control of winter annual weeds which can eliminate the need for a post emergent herbicide application the following spring. Though weed control from fall applications can last shorter into the following growing season than spring applications, a split application can help eliminate this problem. Several herbicides registered for use on fruit crops have a recommendation for fall or fall/spring split applications. Materials such as Surflan, Devrinol, Princep, Karmex and Kerb perform well in fall or fall/spring split applications. See ID-168 and ID-169 for complete weed control recommendations.



**Blueberry Integrated Crop Management School:** Blueberry growers, consultants and educators will be interested in an in-depth program to be held at the Kellogg Biological Station near Battle Creek, Michigan on November 3-5, 1997. This is the first time MSU Extension has offered such a concentrated program on the management of insect and bird pests, diseases, and weeds in blueberries. The program will emphasize in-field identification, scouting and monitoring, and control strategies. Researchers and extension educators from Michigan and other states will provide over 20 hours of lecture covering the most current information and research on these topics.

The first day will be devoted to insect pest management. Instructors will include Dr. Shridar Polavarapu (blueberry entomologist, Rutgers University), Dr. Duke Elsner (MSU Extension Horticulture Agent), Dr. Mark Longstroth (MSU District Fruit

Agent), and Mr. Dave Trinka (Horticulturist, MBG Marketing). Emphasis will be on blueberry maggot, cranberry and cherry fruitworms, Japanese beetle and aphids.

Blueberry disease management will be the topic on Day 2. The primary instructors will be Dr. Peter Oudemans (blueberry pathologist, Rutgers University) and Dr. Don Ramsdell (recently retired pathologist from MSU). Mark Longstroth and Dave Trinka will contribute additional insights. The biology, identification and control of the most serious fungal and viral diseases of blueberry will be emphasized. The evening of Day 2 will be devoted to bird management (Dr. Marvin Pritts, Horticulture from Cornell University), sprayer characteristics and calibration (Dr. Gary VanEe, MSU Agricultural Engineer).

Weed management will be discussed on Day 3. Speakers will be Dr. Richard Bonanno (Weed Specialist, University of Massachusetts), Dr. Eric Hanson (MSU Horticulturist), and Dr. Marvin Pritts. Mark Longstroth and Dave Trinka will share their field observations. The emphasis will be on weed identification and growth habits, cover crops and ground cover management, and cultural and chemical control strategies.

The Kellogg Biological Station is equipped with state-of-the-art lecture facilities, dormitories, and a cafeteria so that students can sleep, eat and study on site. The registration fee of \$225 covers two nights lodging, all meals, notebook and hand-outs. Individuals within commuting distance can register for \$175, which includes everything except lodging and breakfasts. The Blueberry ICM School is the week following the MBG Marketing Blueberry Convention and Trade Show (October 29-30) and the North American Blueberry Council meeting (October 31). These events will be in Grand Rapids, less than an hour drive from the Kellogg Biological Station. Individuals from outside Michigan may want to consider attending these programs during a single trip. If you would like additional information on the Blueberry ICM School, contact Laurel Raines (616 429-2425), Mark Longstroth (616 657-7745) or Eric Hanson (517 355-2261).

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**USDA Tree Assistance Program:** We just received announcement of the 1997 Tree Assistance Program (TAP) administered by the Farm Services Agency which provides up to 100 percent cost-share payments to orchard and vineyard growers who incurred losses due to natural disasters, including but not limited to damaging weather, including losses caused by freeze, excessive rainfall, floods, drought, tornado, excessive winds and earthquake in Fiscal Year 1997 (October 1, 1996 through September 30, 1997). Payments are authorized only for eligible owners who actually replant or rehabilitate orchard trees and vineyards. **TAP applications must be filed August 18 through September 12, 1997 in the grower's county Farm Service Agency office.** Contact your county Farm Services Agency for application forms and eligibility requirements forms and eligibility requirements.

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