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Crop Conditions

FFF 98-09
June 30, 1998

Blueberry harvest has started which is about two weeks ahead of normal. The high heat and humidity is making it tough on pickers, but the berries are holding up well. Summer raspberry harvest is well underway. Fruit size is very large due to the early season rains. Botrytis fruit rot is fairly common and there appears to be a high incidence of stink bug or tarnished plant bug feeding this year as well as white drupelets caused by exposure to high temperatures and UV light. Peach harvest has begun in the south. Japanese beetle emergence is reported in southern and central areas.



Weather Notes: Rainfall for the last two weeks of June has been above normal statewide with the central 1/3 receiving the greatest amount of rain during this period. Rainfall amounts range from 127% of normal in the northeast to 355% of normal in the central region. For the entire month of June, amounts range from 135% of normal in the northeast to 327% of normal in the central region. Average temperatures and variation from normal for the past two weeks ranged from 2.2 to 4.7 degrees above normal in the southwest and northcentral regions respectively. For the entire month temperatures are about 1 degree below normal statewide.

If we receive no more rain for the month of June the statewide average will rank 5th in the last 105 years following, in order from the wettest to this year, 1958, 1902, 1957 and 1928. The northern 1/3 of the state is suffering from dry conditions and concern there is lack of moisture while central and south is concerned with an abundance of moisture. Counties in the central portion of the state have begun to recover somewhat from the recent heavy rainfall and

some fieldwork has resumed but the southern 1/3 of the state, particularly the southeast, is still suffering from the effects of recent weather patterns. As of the crop report issued June 22, 11% of the corn and 31% of the beans had not been planted in the southern 1/3 of the state.

The medium range forecast model continues to indicate hot, dry conditions moving into the entire Ohio valley over the next two weeks. The 6 to 10 day outlook calls for near normal temperatures and near normal rainfall. The 30 day outlook calls for near normal temperatures and rain. The long-range outlook for July-Aug.-Sept. calls for near normal temperatures and above normal rainfall.

La Nina: Sea-surface temperatures continue to cool in the Pacific with departure from normal sst's at -3.0(c) stretching from the international date line to 120 degrees longitude. This was a very quick change (from very warm to cool). The models continue to indicate the greatest impact to US weather will be later in the fall and during the winter. -from the *Purdue Crop & Weather Notes June 26*



Sooty Blotch & Flyspeck: Young developing apple fruit are already showing the dark smudges and black speckling indicative of sooty blotch and flyspeck, and it's no wonder considering the heavy amounts of rainfall we've experienced over the past few months. This is shaping up to be one of those "worst-years-ever" for sooty blotch and flyspeck as well as other fruit rot diseases. These diseases are easily controlled if fungicide applications are maintained on a regular schedule throughout the summer months. They become a problem when the time between sprays is stretched too long (3 to 4 weeks) and/or when spray applications are stopped too early in the season. Check harvest restriction days on the pesticide container label and MAINTAIN fungicide applications on a REGULAR SCHEDULE up to the cut-off period. See ID-168, "1998 Indiana Commercial Tree Fruit Spray Guide", for further information. -Pecknold

Brown Rot of Stone Fruits: As fruit softens during the ripening process, it becomes more susceptible to brown rot. Keep in mind that wet, humid weather is ideal for brown rot development. Scout orchards now for brown-rot-infected, aborted fruit. Also maintain good insect control, especially for curculio. Special attention to brown rot control is required where trees are planted closely and/or where the orchard is surrounded by woods. Such conditions reduce air movement, and dew or rain evaporates more slowly, leading to possible brown rot outbreaks. -Pecknold



Yield Assessment and Adjustment in Grapes: Grapes require careful control of crop size to balance the amount of fruit to vegetative growth.

An optimum balance leads to maximum yields of high quality fruit and adequate vine growth for consistent productivity. Excess fruit production leads to poor fruit quality and reduced vegetative growth, resulting in lower potential production in the future. Though crop control is generally accomplished through balanced pruning, many French hybrid cultivars tend to be overly productive, so balanced pruning alone will not adequately control crop size. These cultivars require careful crop load adjustment to prevent weakening of the vines.

The potential yield must be estimated to determine if crop reduction is necessary. Potential

yield is determined by the number of vines per acre (based on row and vine spacing), the number of clusters per vine, and the weight of the mature clusters. At standard spacing (8' x 10') there are approximately 545 vines per acre. If each vine produced 20 lb. of fruit, the yield on a per acre basis would be 10,900 lb., or about 5 1/2 tons. To determine how much fruit a vine will yield, count the number of clusters and estimate the cluster weight based on cultivar and past performance of the vineyard. Multiply average cluster weight by number of clusters, then by number of vines to determine yields per acre. Cluster size is largely determined by genetics of the cultivar and is relatively consistent from year to year, however, factors such as cluster thinning, fruit set and environment can have an effect on cluster weight. In our trials at Southwest Purdue Agricultural Center and Horticulture Research Farm we have been taking data on yield, cluster weights, berry weights, etc. for the past two seasons and from these data we are beginning to get a good idea of performance of many grape cultivars. In our trials, large clusters average about 1/3 to 1/2 lb. but can be much larger. Large clustered cultivars include: Seyval, Vidal, Chardonnay, Cayuga White, Villard blanc, and seedless cultivars such as Reliance, Marquis, and Himrod when cluster-thinned. Medium clusters average about 1/4 lb. Medium clustered cultivars include: Chambourcin, Chancellor, Horizon, LaCrosse, Melody, Traminette, Concord, Niagara, and Catawba. Small clusters average about 1/5 to 1/8 lb. Small clustered cultivars include: Cynthiana/Norton, Foch, Leon Millot, Delaware, Baco noir, Ventura, and Vignoles.

Yields from 5 to 7 tons per acre are reasonable for most wine grape cultivars in moderately vigorous vineyards, though actual yields range from less than 1 ton to well over 10 tons per acre depending on cultivar and vine vigor. Growers must know the relative vigor of their vines (pruning weights) and past performance of the vineyard to determine the maximum yield potential. A good rule of thumb is that the "crop load" (ratio of yield to pruning weight) should be in the range of 7 to 15 for French hybrid and American cultivars. It is easy to overcrop grapes if careful attention is not paid to crop load. Set a target yield based on past experience and adjust the crop to meet that target. Keep good records to determine the appropriate yields for each particular vineyard block.

To adjust the crop load first adjust shoot number. Adjust shoot density to approximately 6 shoots per foot of row on a single curtain system (48

shoots/vine at 8 ft spacing). An excessive number of shoots can create a shading problem which reduces fruit quality and bud fruitfulness for next year. Remove secondary and non-count shoots before primary shoots. After shoots are thinned to the proper density, estimate the yield by counting the clusters on the remaining shoots. To further reduce the crop cluster thin to one or two clusters per shoot depending on cluster size and number per shoot. Leave the basal cluster as it is usually the largest. Shoot removal should be completed relatively early in the season to reduce vine stress, but cluster thinning can continue up through veraison if necessary. -*Bordelon*

Late Season Grape Disease Control: The first of July signals the shift from early season to late season disease control strategy in grapes. From now until harvest the spray interval can generally be extended to 14 to 21 days (depending on rainfall) and growers must change fungicides. On most grape cultivars the last application of mancozeb is recommended two weeks post-bloom. Because of its 66 day pre harvest interval, one of the other broad spectrum fungicides must be substituted for mancozeb for the remainder of the season. Other broad spectrum materials currently available for late season disease control are captan, ferbam, ziram, and fixed copper and lime. Ziram has been granted a 24c label (Special Local Needs) for Indiana which allows its use during the late season (21 day PHI). Ziram is a good all round material for control of Phomopsis, downy mildew, ripe rot, and black rot, and aides in control of Botrytis. It is a little weak on black rot, so it should be used with Nova or Bayleton if disease pressure is high. Ziram has a 48 hour reentry interval compared to the 4 day REI for captan. The grower must be in possession of the supplemental label in order to use Ziram past bloom. If you need a label, contact Bruce Bordelon, 765-494-8212, or Joe Grippi (Elf Atochem) 614-575-2742. -*Bordelon*



Japanese Beetles: They're out, they're hungry, and they're after your fruit crop! Though they seem to eat everything, Japanese beetles are particularly fond of grape and plum foliage, and blueberry and raspberry fruit. Scout often and apply an insecticide registered for your particular crop if necessary. Beetles can cause serious losses in blueberries and raspberries by feeding on fruit. Fruit are damaged, but not completely consumed by beetles in a

single feeding. The next feeding the beetles select clean, undamaged fruit, so that a single adult may damage dozens of berries in its lifetime. Multiply that by thousands of beetles and the losses can become significant. One problem applying pesticides near harvest is the potential for visible residue on the fruit, especially with dark colored fruit such as blueberries. Growers may want to consider the XLR formulation of Sevin because it does not leave as much visible residue as wettable powder formulations. The pre harvest interval (PHI) is another consideration when applying pesticides close to harvest. For Sevin, the PHI on small fruits is 7 days. Imidan has a 3 day PHI and a SLN (Section 24) registration for blueberries in Indiana that allows up to 5 applications. Though Imidan isn't quite as effective as Sevin, it seems to persist a little longer. Raspberry growers will have to rely on Sevin or malathion. Malathion is less effective, but has a 1 day PHI. Check the small fruit spray guide for a complete list of registered insecticides, their PHIs and relative effectiveness. -*Bordelon*

IHS Summer Meeting: We recently had a very successful summer meeting with about 60 growers in attendance. On the orchard tour, some of the topics discussed were weed control, new varieties and new strains of old varieties, and pruning strategies for getting trees back into shape. Back in the market, the Beasleys told us about some of the innovative things they were doing and shared their experience with holding festivals. From the discussion, it was obvious that collectively we have a lot of knowledge and experience when it comes to marketing, and the discussion emphasized once again one of the strengths of our industry is our willingness to be open and freely share information. John and Debbie Beasley were very hospitable hosts and we applaud their efforts in helping to make the summer meeting a success. -*Hirst*

Season Looking Fantastic: At the summer meeting, the almost universal sentiment was that the crops this year are looking great. Even many of those folks who previously thought they had overthinned are now feeling that maybe things don't look so bad and perhaps they got their thinning about right. The warm weather for the month or so after bloom helped us out greatly, with most growers saying the fruit size is looking excellent. So often we tend to focus on the negative, but heavy crops of large excellent quality fruit doesn't seem to be a bad problem to have. Get those pickers lined up! -*Hirst*

IHS Winter Meeting: Isn't it too early to be thinking about the winter meeting? No, now is the time to give it a little thought. As IHC President Ed Fackler mentioned at the meetings, if you have any topics you would like to be addressed at the meetings, then please let Ed or Peter Hirst know as soon as possible, and we'll do our best to get it on the program. Remember, this is your meeting, so here's your chance to make sure it's what you want. *-Hirst*

Apple Fruit Maturity: Some folks have started harvesting Lodi, and the question arises, 'how do I know when to pick?' There are many criteria that can be used to assess apple maturity - some of them are useful for growers to use and some are only suited for use in the laboratory. First, a little background. Fruit is mature when it is capable of continued develop-

ment off the tree. This is different from ripe, which is related to the human perception of a fruit being ready to eat and covers such things as texture, and sugar and acid levels. If you are harvesting fruit for immediate sale, then you will want to harvest your fruit in a ripe (ready to eat) condition. However, if you intend to store the fruit for any length of time, then mature but not ripe is where you'll want to be since the fruit will continue to develop (albeit slowly) in cold storage. OK, so how do I make the when to harvest decision? There are a number of practical things to look at.

1. Calendar date - this will give you a broad idea when to start looking at fruit maturity. In order to refine this a little, the number of days from bloom to harvest can be calculated - the following table gives an approximate guide.

<u>Anticipated days from bloom to harvest for a number of important apple cultivars.</u>	
<u>Cultivar</u>	<u>Days from Bloom to harvest</u>
Yellow Transparent	70-90
Lodi, Pristine	75-95
Mollies Delicious, Red Free	120-125
McIntosh, Cortland, Gala	125-145
Jonathan, Liberty, Grimes Golden, Empire, Red Delicious, Golden Delicious, Jonafree	140-150
Mutsu	145-170
York Imperial	155-175
Rome, Winesap, Stayman	160-175
Braeburn, Fuji, Goldrush, Enterprise, Granny Smith	180-210

2. Skin color - this is more useful with some varieties than others. With many bi-colored apples such as Gala, the skin background color changes from green to yellow as the fruit mature. This can be a very useful harvest indicator, especially for varieties that require multiple pickings.

3. Seed color - seeds turn from white to brown/black as fruit mature, so this can be a useful indicator to get you in the right ballpark.

4. Starch levels - as fruit mature, starch is converted to sugar, so finding out how much starch is left is a good indicator of how far along we are. Starch can be seen by cutting fruit in half and spraying the cut surface with an iodine solution. This solution can be

made from 0.3 oz (10 g) of potassium iodide and 0.1 oz (2.5 g) of iodine in 1 quart of water. These should be available from a drug store. During mixing and use of this solution, make sure the area is well ventilated - iodine fumes are toxic. This solution should be stored in a plastic or glass container as it is corrosive to metals. Providing the container is well stoppered, the solution will keep for long periods of time. Once the fruit surface is sprayed with this solution, the pattern should develop in about 1 minute. If the fruit surface turns black, this indicates that there is a lot of starch in the fruit and it is not ready to be harvested. If the surface stays completely white, then fruit is ripe and should be harvested and sold immediately. Fruit

that is going to be stored for a short period of time or marketed immediately should only have a little black (small amount of starch) present.

5. Sugar (soluble solids) or brix levels - this can give a guide, but there are many things that can influence sugar levels besides fruit maturity. Although rising sugar levels give an indication of fruit maturity, they should not be used as the only harvest criteria.

6. Fruit firmness - like sugar levels, many factors can affect fruit firmness, so although firmness can give a trend, it is not very useful by itself.

7. Taste - the best one of all! An experienced taster can judge firmness, sugar level, amount of starch and acid level all from one bite. A good idea is to take some of these measurements on one side of the fruit and taste the other half to get tuned into the difference in taste between a 10% sugar apple and a 12% sugar apple (there is a big difference in taste between 10 and 12%). -Hirst



Indiana Winegrower's Guild Summer

Meeting and Vineyard Tour: The IWG will hold its annual summer meeting on July 6 at Oliver Winery, 8024 N. State Road 37, Bloomington. The IWG business meeting will begin at 1:00 PM EST. There are several important issues on the agenda, including a legislative update, symposium report, and election of new officers. A tour of the winery will begin at 3:30 PM after which we will caravan to the Creekbend Vineyard for a tour and discussion followed by a barbecue dinner at 6:00 PM. Bring your favorite wine to share with the meal. Cost for dinner will be \$7.00 which can be paid on site, but you must pre-register or you will have to cook and do the dishes. Call Steve Thomas (800)948-8466 or Dave Gahimer (888) 965-WINE to register of for more information.

Oliver Winery is the largest winery in the state and just recently completed renovation of the sales room, offices, and storage area. Bill Oliver's Creekbend Vineyard is on an excellent site and features Cabernet Sauvignon, Cabernet Franc, Chardonel and Foch. The vineyard tour will include a discussion of various training systems in use at Creekbend, yield assessment and adjustment, training young vines, and results of a study of spur length in Chardonel.

Directions: Oliver Winery is located on State Road 37 five miles north of Bloomington (about 10 miles south of Martinsville). Watch for the signs. We will meet at the winery and caravan to the vineyard which

is about 8 miles away. Maps will be available.

? Questions and Answers: Growers often have questions about articles that appear in this newsletter, or topics we don't cover. If you have a question or a topic you would like to see discussed, send it to one of us by mail or email and we'll be happy to do an article for the next issue of the newsletter.

Subscribing Electronically: To subscribe (or unsubscribe) to Facts for Fancy Fruit, send a message to fff@lists.hort.purdue.edu with the subject or body "subscribe" (or "unsubscribe"). You can also use the form at the web site <http://www.hort.purdue.edu/fff/maillinglist.html> to submit your subscription. Electronic access is free of charge.

Coming Meetings

July 6 — Indiana Winegrower's Guild Summer Meeting and Vineyard Tour. 1:00 PM Oliver Winery, S.R. 37, just north of Bloomington. Contact Steve Thomas (800)948-8466 or Dave Gahimer (888)965-WINE.

July 21 — Ohio Small Fruit Tour, begins in Piketon at the OSU Piketon Research & Extension Center. Contact Tom Wall, OSU Piketon (800) 297-2072, or Mike Pullins at (614) 249-2424 for more information.

July 21 — 1998 Southern Ohio Winery Tour. Hosted by Valley Vineyards Winery. Reservations required. Contact Valley Vineyards Winery at 513-899-2485 for more information.

July 22 — Cider Seminar, Reynoldsburg, Ohio. For more information contact Dr. Diane Miller at (330) 263-3824.

July 21-24 — American Society for Enology and Viticulture/ Eastern Section 23rd Annual Meeting, Grand Rapids, MI. Contact: Ellen Harkness, Dept. of Food Science, Smith Hall, Purdue Univ. W. Lafayette, IN 47907-1160, Phone 317-494-6704, FAX 317-494-7953 Email: harkness@foodsci.purdue.edu.

July 30 — Viticulture Field Day, Southwest Michigan Research and Extension Center, Benton Harbor, MI. Contact the SWMREC at 616-944-1477.

Sept. 13 - Ohio Valley Harvest Festival, Noon to 6:00 P.M., Riverfront Plaza/Belvedere, Louisville, KY. Contact Roy Ballard, Floyd Co. Extension, 8121/948-5470



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