

Defoliating peaches

By Mercy Olmstead

In northern climates, peach leaf defoliation occurs naturally with the first frost event, and trees enter into dormancy, ready for the upcoming winter. However, as growing areas for subtropical peaches expand and move farther south in the United States, growers cannot count on a frost event to defoliate trees in most years.

In Florida, peach growers spend their postharvest efforts trying to keep peach leaves on the tree, and to avoid defoliation due to diseases or other factors. Early defoliation can occur if large infestations of peach rust (*Tranzschelia discolor*) or bacterial spot (*Xanthomonas campestris* pv. *pruni*) are present in the late summer months, which may cause peach trees to bloom, reducing the yield for the following year. Premature defoliation has also been shown to delay bloom timing in some older, low-chill peach cultivars, while in higher-chill cultivars, trees that are not defoliated can delay bloom time.

Maintaining peach leaves is

important to build carbohydrate reserves and nitrogen-based compounds that are then remobilized in the early spring as the trees bloom and set fruit. Without good stores of both types of compounds, fruit set may be erratic, resulting in reduced yields.

So, why do peach trees in subtropical regions need defoliation in the late fall or early winter? The two main reasons are to allow the fruit buds to be receptive to cool temperatures and chill unit accumulation, and as a tool to manipulate bloom time the following calendar year. Previous research has shown that if leaves have not detached from the shoot, chill units are not as effective as if the shoot was defoliated.

The effective range of temperatures for chill accumulation in peaches occurs between 43°F and 46°F. In north central Florida, these nighttime temperatures often occur between November and January, with bloom periods occurring during the first to second week of February (Figure 1). In south central

areas, these temperatures occur from December to January (Figure 2), with bloom periods as early as the first or second week of January in a typical year. Chill units accumulated after the flower initiation process has started are no longer considered effective toward a variety's chill requirement.

Defoliation can also be used to manipulate bloom period, with delays in defoliation resulting in delays of bloom time. In Flordaprince, the later defoliation sprays were applied, the later bloom occurred, which also resulted in larger fruit. Unfortunately, there are no recent studies to see how defoliation affects newer low-chill varieties. However, it is expected that the mechanism underlying these effects would remain the same with similar results.

APPLICATION TIMING

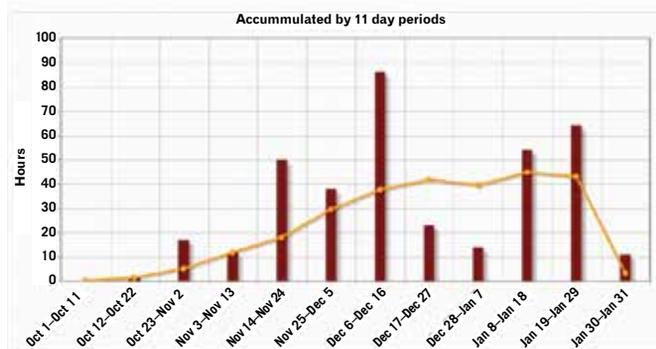
In north central Florida, recommendations have been made that applications for defoliating peach trees should occur by the last week of November to fully take advantage of cold nights (<46°F) that often occur during this time period. For most varieties grown in north central Florida that have a chill requirement between 200 and 350 chill units, this defoliation timing maximizes chill accumulation.

Temperature: 32–45 °F – Marion County (FL)

| | | |
|--------------------------------------|------------------|-----------|
| Period [Oct 1, 2014 – Jan 31, 2015]: | This season | 371 Hours |
| | Last season | 315 Hours |
| | Historic average | 277 Hours |

■ Current accumulation

■ Historic average



Data courtesy of Agroclimate (<http://agroclimate.org/tools/Chill-Hours-Calculator/>).

Figure 1. Accumulated chill units from October 1, 2014 to January 31, 2015 in Citra, Florida. Red bars indicate accumulated chill units weekly, while the yellow line indicates historical chill accumulation for the same time period.

Temperature: 32–45 °F – De Soto County (FL)

| | | |
|--------------------------------------|------------------|-----------|
| Period [Oct 1, 2014 – Jan 31, 2015]: | This season | 84 Hours |
| | Last season | 84 Hours |
| | Historic average | 176 Hours |

■ Current accumulation

■ Historic average

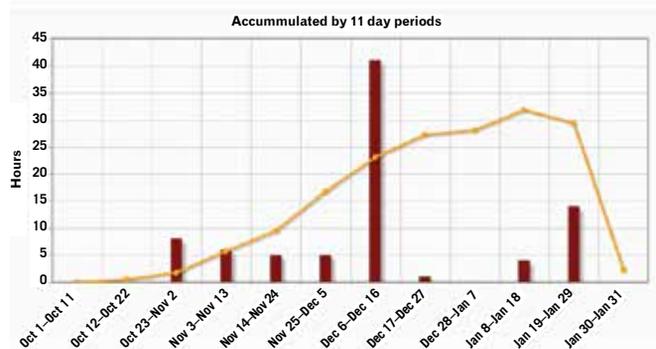


Figure 2. Accumulated chill units from October 1, 2014 to January 31, 2015 in Arcadia, Florida. Red bars indicate accumulated chill units weekly, while the yellow line indicates historical chill accumulation for the same time period.



Figure 3. Peach trees with higher rates of nitrogen (160 or 240 lbs. N/acre annually) did not completely defoliate when a 10 percent zinc sulfate solution was applied on November 11, 2014. Trees were treated with no nitrogen (0 lbs. N/acre); 80 lbs. N/acre; 160 lbs. N/acre; or 240 lbs. N/acre annually.

In central and south central Florida, where peach varieties with lower chill-unit requirements (<200) are grown, defoliation can be used as a tool to delay bloom, and consequently fruit development and harvest into the appropriate market window. Growers in these areas have observed that approximately one month after defoliation, peach trees begin the bloom process. This short time from defoliation to bloom indicates perhaps that peach trees in these areas do not enter into a deeper dormancy, called endodormancy. Thus, growers in central and south central Florida can delay defoliation sprays until December or later, depending upon the year and long-term temperature predictions.

RECOMMENDED CHEMICALS

Defoliation in peach trees can be achieved with either copper sulfate or zinc sulfate. In Florida, zinc deficiency tends to be a chronic problem. Therefore, recommendations are made for using zinc sulfate to defoliate trees. After zinc sulfate is applied to the leaves, a small portion of zinc is remobilized to the buds and is then available in the following season after bud swell and early shoot growth, helping to alleviate early-season zinc deficiency.

Zinc sulfate can be applied in a tank mixture in a range from 4 percent to 10 percent to achieve effective defoliation. Depending upon the material, zinc sulfate often dissolves more completely

in warm water, so it is recommended that the material is mixed in a small portion of warm water before being diluted in a larger tank for spraying. Higher rates with a second application can be made if satisfactory defoliation is not achieved with a single spray.

As with all chemical applications, be sure to read the label completely before use and follow all directions.

In addition, all spray equipment (tanks, hoses, pumps, etc.) should be thoroughly cleaned after application, as zinc sulfate is highly corrosive if left to sit in the tank over a long period. Efficacy of this spray can be affected by nitrogen fertilizer rates (Figure 3), and in a 3-year study, we found that trees with higher nitrogen leaf percentages were more difficult to defoliate completely.

Defoliation in subtropical peaches is necessary to achieve uniform budbreak of vegetative and floral buds in the subsequent spring. However, both rate and timing have been used to manipulate the degree of defoliation and bloom time, depending upon orchard location. 🍑

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