STAGE OF DEVELOPMENT

The prolonged warm weather in February and early March has pushed bud development about three weeks ahead of normal. In areas A and B, the peach fruit buds are showing pink. In area C, the peach leaf buds are breaking.

Apples are 1/4- to 1/2-inch green in area A, and 1/4-inch green in area B. They are in the dormant to silver-tip stage in areas C and D.

PEACHES

The rapid development of peaches makes us all apprehensive about the crop because of the possibility of cold weather yet to come. Frank Street's weather records and peach notes for the years since 1940 at Henderson, Kentucky, are interesting. In thirteen of those years, peaches bloomed in March. The earliest bloom date was March 21 in 1946, and the last killing frost in the spring that year was on March 11. Frank had a full crop that year.

In ten of the thirteen years when peaches bloomed in March, Frank recorded full crops. Those ten years were: 1944, 1945, 1946, 1948, 1949, 1952, 1953, 1954, 1967, and 1975. Spring frosts reduced the crop in the other three years of March bloom, to a third of a crop in 1974, half a crop in 1975, and to a quarter of a crop in 1961.

In eight of those thirteen years, no killing spring frost occurred during or after bloom. In two of the early blooming years Frank had a full crop even though killing frosts occurred during or after a bloom.

Because of the increased danger of frost during or after bloom this year, we suggest delaying pruning until after bloom. Peach trees can stand late pruning without serious effects on the tree.

INSECTS

Plant spray oil should be used each season to reduce European red mite and San Jose scale populations. Oils are discussed on pages 43, 44, and 45 in Illinois Circular 1073 on pest controls. Oils are not effective on aphid populations, so an insecticide should be used by the tight-cluster stage. Systemic phosphate insecticides are very effective anytime during the early season.

Mites have been somewhat troublesome in young orchards. The herbicides used to keep weeds, and therefore machinery, away from the trunks have also eliminated the living space of predatory mites. These mites over-winter in the ground litter and spend the time from bloom to about third or fourth cover feeding and increasing their numbers in the growth under the tree.
Clear ground and close mowing do not allow space in which to develop adequate numbers of predatory mites to control red mites on the trees. A possible solution is to make the band of herbicide treatment as narrow as possible while still being effective. Also, let several feet of ground cover growth remain unmowed next to the herbicide treatment; and when mowed, first mow only one side and leave the other unmowed until regrowth has occurred.

DISEASES

The unseasonably warm weather has caught many of us off guard. The first sprays required for early disease control are now due in areas A and B. Apple scab perithecia are mature and are ready to release ascospores with each rain. The occurrence of rain, the presence of ascospores, and the exposed green apple tissue make a fungicide application necessary. There are several excellent scab fungicides, but remember that none of them are effective in eradicating infections. Therefore, the secret to any good spray program is to protect all exposed tissue before it becomes infected.

If you plan on using captafol (Difolatan 4F) this year, you should also be aware of the following facts.

1. Two rates of Difolatan are suggested in our spray circular: a 3-quart or a 5-quart rate (per 100 gallons). The lower rate should control scab until pink-bud in a normal year (three weeks), the higher rate until petal-fall (six weeks). Obviously, 1976 is not a normal year! If we encounter a long, wet and cool period between the spray application and pink-bud or petal-fall, scab infections could result. Therefore, be prepared to apply additional scab sprays.

2. Don't prune trees after spraying, because many people are allergic (skin rash) to this material.

3. Difolatan should be applied in combination with the dormant oil. Do not apply the Difolatan and then follow in a few weeks with the oil, because phytoxicity can occur.

4. Apply Difolatan at or before the 1/4-inch green stage. Spraying after this bud stage can result in leaf burn and fruit russet.

5. Difolatan will only control apple scab. If powdery mildew or cedar apple rust are problems, you might consider the 3-quart rate until pink-bud, then changing to a fungicide that is effective against these two diseases.

There are several other good scab fungicides. Two of these are Benlate and Cyprex. Benlate- and Cyprex-tolerant strains of the apple scab fungus have been reported in neighboring states. It would not be wise to rely on just one material. Please consider alternating fungicides or using registered mixes.

Powdery mildew is a severe disease in some areas of the state. This has prompted a renewed interest in the use of liquid lime sulfur for mildew control. There is no question about its effectiveness, but it does have a few faults. Liquid lime sulfur is incompatible with most orchard pesticides, and it is phytotoxic. Although this type of injury will not defoliate trees, it does dwarf the leaves and cause some leaf spotting and marginal burn.

If powdery mildew is a problem in your Jonathans, lime sulfur is not likely to be the cure-all. To be effective, it must be applied thoroughly, the same as
any other mildewicide. If you are not planning to improve your method of applica-
tion, do not expect a switch to lime sulfur or any other mildewicide to help you.

If you plan to use sulfur 95W for mildew control, apply the dormant oil
spray by green tip. A sulfur spray soon after oil can result in leaf burn.

PEACHES

Peach buds have swollen in area C. This means that the leaf curl fun-
gus has already established itself in these buds, and we may have a severe curl
problem this year. Hopefully, many orchards applied this critical spray before
bud break. If you haven't, maybe the spray program you followed last year reduced
spore carryover. Severe peach leaf curl will devitalize infected trees. Therefore,
apply sufficient fertilizer to maintain the vigor of infected trees.

CORRECTION

Circular 1073 (Supplement)—Restrictions of pesticides used on tree
fruits. Number of days between last application and harvest.

<table>
<thead>
<tr>
<th>Pesticide</th>
<th>Apples</th>
<th>Pears</th>
<th>Apricots</th>
<th>Cherries</th>
<th>Peaches</th>
<th>Nectarines</th>
<th>Plums</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ferbam</td>
<td>7</td>
<td>7</td>
<td>21</td>
<td>0</td>
<td>21</td>
<td>pre-bloom</td>
<td>7</td>
</tr>
</tbody>
</table>

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Bud development this year varies widely from variety to variety, and even from tree to tree within the same orchard. This appears to complicate the decision of whether or not to spray. Omitting sprays at this time of year is the single greatest mistake a fruit grower can make. Successful apple scab control depends on preventing the first lesion(s). If these initial infections are left uncontrolled, the progeny (conidiospores) produced by the lesion(s) will be a problem for the rest of the growing season. Early scab can cause early defoliation, can affect fruit quality, and can devitalize trees by preventing normal fruit-bud formation for next year's crop.

If green tissue is present on varieties susceptible to apple scab and if climatic conditions are favorable—i.e., frequent wetting periods and appropriate temperatures (see the table)—protective fungicide applicators are required.

<table>
<thead>
<tr>
<th>Temperature (degrees F.)</th>
<th>Primary (ascospores)</th>
<th>Secondary (conidia)</th>
</tr>
</thead>
<tbody>
<tr>
<td>32 to 40.</td>
<td>48</td>
<td>45</td>
</tr>
<tr>
<td>41 to 42.</td>
<td>30</td>
<td>27</td>
</tr>
<tr>
<td>43 to 45.</td>
<td>20</td>
<td>17</td>
</tr>
<tr>
<td>46 to 50.</td>
<td>14</td>
<td>11</td>
</tr>
<tr>
<td>51 to 53.</td>
<td>12</td>
<td>9</td>
</tr>
<tr>
<td>54 to 58.</td>
<td>10</td>
<td>7</td>
</tr>
<tr>
<td>59 to 76.</td>
<td>9</td>
<td>6</td>
</tr>
<tr>
<td>77+</td>
<td>11</td>
<td>8</td>
</tr>
</tbody>
</table>

Cyprex and Benlate are excellent fungicides for controlling scab. Difolatan is also extremely effective, but phytotoxicity will occur if this fungicide is applied after 1/4-inch green stage. (See Spray Service Report No. 1 for 1976 concerning rates, methods, and precautions.) Areas C and D could still apply Difolatan.
Powdery mildew control on susceptible varieties must begin between greentip and tight-cluster stages. Rust disease control must start at pink-bud and continue until about third cover.

At this time of year, dead wood and prunings should be removed from the orchard and destroyed. This wood is frequently infected with the black rot and Botryosphaeria rot fungi. If this wood is left in the orchard, spores will be produced on it which can infect the trees and fruit.

PEACHES

The brown rot fungus, a major problem of ripe peach and nectarine fruit, can be a problem at bloom causing blossom blight. Although this phase of brown rot is not common in Illinois, the potential for serious disease is real, especially in the more southern section of Area A. Therefore, consider two spray applications of either sulfur or Benlate (benomyl) during early-bloom and full-bloom. Benlate-tolerant strains of the brown rot fungus have been reported in Michigan. So, please consider one spray of each fungicide. Preliminary results in the laboratory indicate that these fungicides do not reduce the germination ability of peach pollen.

BUD STAGE DEVELOPMENT

In Area A, peaches very from swollen but closed buds to open blossoms, and apples from green-tip to 1-inch leaves and pink showing. When growth starts early and then is delayed, there is often wide variability in development, even within a variety in the same block. Parts of Area A have been dry and at this writing, the buds have an excellent chance for survival.

There has been very little development in the Urbana area in the past two weeks.

The notes in the fruit calendar will need to be read with the general average of the stage of development that you see in the orchards. Insect and disease development will continue to match the bud development, as described in the calendar notes. Aphids have hatched in Area A and have probably started hatching into area C, since some are often waiting for the first green to appear.
STAGE OF DEVELOPMENT

In Area A, peaches are in the shuck to shuck-split stages and apples are in full bloom to early petal fall. In Area B, peaches are in the shuck stage and apples are in early to full bloom. In Area C, the peaches are blooming and the apples are in the tight-cluster stage. In Area D, apples are in the green-tip to half-inch-green stage.

CROP PROSPECTS

Although there was considerable winter kill of flower buds, most peach varieties have set a sufficient crop in Areas A and B and there appears to be an adequate bloom in Area C on the more winter-hardy varieties.

The freeze March 17 killed 20 to 40 percent of the flower buds on Lodi, Duchess, and Red Delicious apple trees planted in low areas in Areas A and B. Good pollinating conditions could overcome this loss.

BORON NUTRITION

The minor element boron is essential for pollen germination and the production of sugar. Boron can be applied as a foliage spray, or it may be applied to the soil. The foliage spray is quick-acting whereas the soil application is slow-acting but lasts for several years.

If a soil application of 20 pounds of borax per acre has not been made within the last three years, a foliar application of Solubor will insure adequate levels of boron. One pound of Solubor per 100 gallons of water can be added to the pink spray, or the same amount can be applied alone during bloom. A second application at the same rate can be included in one of the early cover sprays.

PEACH PRUNING

In Areas A and B, growers should finish pruning their peaches as soon as possible. Pruning will not seriously weaken the tree now, but will do so later.

BEES

Growers who have bees should give them special care this spring. Bee colonies are developing early and are raising large numbers of young. The colonies require large amounts of food, which may not be available from natural sources or from reserves stored in the hive. After apple bloom is over, bees should be checked and fed sugar syrup if they do not have adequate amounts of food.
INSECTS

With apples in bloom over the southern half of Illinois, it is too late for insecticide applications until after bloom. Many growers are finding that they can wait until after bloom to use an insecticide, because they have kept insects under control very well and because they watch their trees quite closely. There are certain precautions northern growers should consider before leaving insecticides out of the sprays used before bloom.

If aphid populations are very high and oil applications of freezes have not reduced their numbers, they could damage some apples in late bloom. Or, if only contact insecticides are used after bloom, control is only partial and damage could result before control is achieved, so a systemic organophosphate should be used in the petal-fall spray. Another precaution is to be aware of such caterpillars as fruit tree leaf rollers, canker worms, or green fruit worms, which are all large enough at bloom to severely injure young fruit.

Such insects do not normally "appear out of nowhere," but will build up over several years. An alert grower would notice the deep scars at harvest time, locate the source of damaged fruit, and watch that part of the orchard closely the following year. Another need for insecticide before bloom would be in areas where curculio damage has been high and in which the probable cause is an outside source. Curculio damage has been low for the past several years in most areas, and cool weather delays their emergence.

Oil sprays were quite effective in trees that were examined in southern Illinois, as red mites were difficult to find. Red mites hatch during pink stage and will be on the first leaves out of the bud and nearest to the rough areas of the twigs where the eggs were located. These mites are concentrated on the small leaves during bloom, so that is a good time to assess the populations and to see where they will need to be watched in later weeks.

DISEASES

APPLES

Apple scab control measures should begin in Area D. For growers in that area, please refer to the 1978 Spray Service Report No. 1 concerning the use of Difolatan for apple scab control. Growers in Areas A and B should now be prepared to apply additional scab-control sprays. Difolatan at 3 quarts per 100 gallons will only control scab until the pink stage; at the 5-quart rate, only until petal-fall. At those bud stages--usually 3 and 6 weeks, respectively--apple scab control must be continued. Therefore, apply another scab control fungicide (Benlate, Cyprex, Dikar, or a labeled mix), depending on the rate of Difolatan used. Continue the scab-control spray program as long as frequent wetting periods occur. Please alternate fungicides.

Control measures for the Quince and Cedar-apple rust disease should have begun at the pink stage where these diseases are severe. Cedar galls are swollen and ready to discharge spores in Urbana. The dithiocarbamate fungicides (Dikar, Polyram, Zineb, and the like) and Ferbam will control rust. Sprays for rust control should continue until approximately the third cover.

Apple powdery mildew control must be continued on susceptible varieties until at least the third cover. Where this disease has been especially severe, it might be wise to continue spraying until as late as the fifth cover. Benlate, sulfur, and Karathane are effective mildewicides.
On varieties susceptible to fire blight, streptomycin should be applied at the late-pink stage and at four-day intervals for the entire bloom period, including late bloom on one-year-old wood. Controlling the blossom blight phase reduces inoculum levels and therefore reduces the incidence of twig blight during the summer. Use the 100-ppm rate if the temperature is below 65°F., and the 50-ppm rate if it is above 65°F. Streptomycin is most effective when slow drying conditions exist, generally between 10 p.m. and 3 a.m.

Many fruit growers are concerned about spraying fungicides during bloom. This concern is based on laboratory studies at the University of Illinois which demonstrated that many fungicides reduce pollen germinability. In a year such as 1976, the possibility of a prolonged bloom period exists. Do not omit fungicide sprays for more than 7 to 10 days. If a spray is omitted, the scab, rust and mildew diseases may become established in your trees. If that happens, you may well lose more fruit to disease than to a possible fruit set reduction caused by fungicides. Do not fail to control diseases.

PEACHES

The critical period for infection by the peach scab fungus is the shuck-split through second-cover bud stages. Microfine wettable sulfur (95-percent wettable) at 6 pounds per 100 gallons of water, or Benlate SOW at 6 to 8 ounces per 100 gallons are the only fungicides that will control scab. Sprays must be applied at 10- to 14-day intervals, up to at least 40 days before harvest. Sulfur and benomyl both give excellent control of peach scab and the blossom and twig phases of brown rot; therefore, we suggest that you alternate these fungicides to avoid developing benomyl-resistant fungal strains in Illinois.
STAGES OF DEVELOPMENT

In Area A, peaches are starting to split their shucks and apples are in the late-bloom to petal-fall stage. Apples have been blooming for two to three weeks in this area. In Area B, peaches are in the early shuck stage and apples are in bloom to petal-fall. Apple bloom has also been prolonged in this area. In Area C, peaches are in full bloom and apples are in pink to early bloom. In Area D, apples are in the half-inch-green to tight-cluster stage.

FROSTS IN AREAS A AND B

Four frosts in the last two weeks in Areas A and B have killed some strawberry flowers. The peaches appear to have escaped damage, but some apple blossoms on trees planted in low areas were killed. Lodi and Red Delicious appear to have suffered the most damage.

CHEMICAL FRUIT THINNING OF APPLES

Variations in fruit size due to the prolonged bloom will make chemical thinning decisions more difficult this year. Your previous records and experiences with chemical thinning will provide the most useful and accurate guide for procedures this year.

The prolonged bloom and resulting uncertainty over fruit set has discouraged the use of Amid-thin on summer varieties, because it must be applied at petal-fall to be effective. On Lodi, NAA at 10 ppm plus 2 pounds of Sevin can be applied when the king fruits are 10 to 12 mm in diameter.

For the fall varieties--Jonathan, McIntosh, Golden Delicious, and Rome, we suggest NAA at half-strength plus either Tween 20 or Regulaid. Both Tween 20 and Regulaid increase the absorption of NAA, thus smaller amounts are needed. For Jonathan and McIntosh, use NAA at 5 ppm plus 1 pint of Tween 20 or Regulaid per 100 gallons. For Golden Delicious and Rome, use 10 ppm of NAA plus 1 pint of Tween 20 or Regulaid per 100 gallons. Apply when the king fruits are 10 to 13 mm in diameter.

For Red Delicious, 1 to 2 pounds of Sevin per 100 gallons is suggested. Apply when king fruits are 10 to 13 mm in diameter.

DISEASES

APPLES

The importance of free moisture (rain or dew) cannot be over-emphasized when considering disease control of fruit crops. Nearly all fungal pathogens of apple, except powdery mildew, require a wetting period to cause an infection. The
probability of an infection depends on how long the surface is continuously wet and the temperature during the wetting period. In earlier reports, we have listed the appropriate tables indicating whether apple scab infections have occurred. However, many other diseases also require moisture for spread and penetration. Two of these diseases are the rust diseases and fire blight. Cedar apple rust is spread by wind currents from cedar tree galls to susceptible apple trees. Two periods of rain are needed. The first rain wets the galls causing them to swell and extrude the spore horns. The second wetting period allows the fungus to penetrate the apple tissue.

The fire blight disease is also enhanced by rain. Water droplets splash bacteria to other parts of the tree while an accompanying wind carriers bacteria across the orchard. The high humidity following a rain also protects the fragile bacterial cell from dessication and death.

During the last two weeks in Urbana, we have had little rain. Perhaps your orchard has also been relatively dry. If dry weather conditions persist, then disease pressure this spring may be light. However, do not rely on a dry spring for disease control. If climatic conditions should suddenly change and frequent rains should occur, the protective fungicide must be in place (on the trees) before the rains come.

Frequent observations of cedar trees near the orchard will help you determine if the galls are ready to discharge spores, and can aid you in deciding whether to spray, when to spray, and what fungicide to use. Similarly, fire blight severity can be assessed at this time of year by walking the orchard (Jonathans) soon after bloom and looking for the blossom blight phase of this disease. If a considerable number of blighted blossom clusters are observed, you must rededicate yourself to additional streptomycin sprays in an effort to reduce the likelihood of the more-destructive twig blight phase of this disease.

Remember that the powdery mildew fungus does not require free moisture to cause disease. Conditions this year have been optimal for this organism.

Control measures during the next few weeks should be focused on control of apple scab, powdery mildew, rusts, and fire blight.

PEACHES

Peaches and nectarines must be protected from the peach scab fungus from shuck split to about third cover. If left uncontrolled, this disease will affect the yield and quality of the fruit. The symptoms of this disease are delayed and do not become obvious until near harvest. Therefore, protecting the trees now helps assure a marketable crop.

INSECTS

With a long bloom period and relatively dry weather, sprays were applied less frequently and growers may be anxious to get into the apples with an insecticide. If no aphid control has been applied, it is best to do this as soon as possible after bloom. However, remember that native honeybees are a valuable asset and many of them would be killed by an insecticide applied while too many blossoms are still attracting the bees.

The first two sprays after bloom on peaches are important to control Oriental fruit moth, plum curculio, and stink bugs. Although we have had lots of windy
days, peach trees do not have much foliage yet for this spray, so one-sided sprays will be fairly effective. As the shucks begin to come off, we need then to get as good a coverage on these young fruit as possible.

Thrip numbers in blossoms have been extremely low in Area A. Tarnished plant bugs also have been difficult to find. Probably the cold weather has influenced this to a large extent. That may not be the case in northern Illinois; and if growers have had dimple injury on the calyx half of the apple, they should put an insecticide in the pink. Ron Meyer would be interested in looking at problem situations if you leave an area without insecticides as a check.

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STAGE OF DEVELOPMENT

In Area A, peaches are in the shuck-split to shuck-off stages and apples are in first cover. In Area B, peaches are in the tight-shuck to shuck-split stages, and apples are at petal-fall. In Area C, peaches are in bloom to petal-fall and apples are in early to mid-bloom. In Area D, apples are in tight-cluster to pre-pink.

FREEZE DAMAGE

A light freeze Friday morning and hard freezes Monday morning and Tuesday morning caused severe damage to apples and peaches in south-central, southwestern, and western Illinois. The worst damage was in Jersey, Calhoun, and St. Clair counties. At Grafton, all open apple blossoms and those at petal-fall were killed, except for Rome Beauty. Full bloom at Grafton was Friday. All peaches at Grafton were killed. The damage in the western part of Calhoun County was similar to that at Grafton. The damage in northern Calhoun County was severe, but was not complete. In southern Calhoun County, the damage was moderate.

In St. Clair County, 90 to 100 percent of the Red Delicious fruits were killed. All open Golden Delicious flowers were killed, but the late-developing flowers appeared to survive. Peaches on the higher elevations seemed to survive, but those on lower ground sustained heavy damage.

At Centralia, 90 percent of the Jonathan fruit was killed. With the heavy fruit set and the possibility of late bloom, there are still prospects for a partial crop of Jonathans. Only about 10 percent of the Golden Delicious fruit and blossoms were killed. The Red Delicious fruits were larger than the Jonathan fruit, and appeared to survive the freeze. The peaches around Centralia also survived.

In Pike and Adams counties, some orchards had only light damage. Others lost 50 percent of the open blossoms on Jonathan and Red Delicious. Golden Delicious, Grimes Golden, and Rome showed little or no damage, as did the peaches.

Fruit in the Carbondale-Chester area and in eastern Illinois showed damage in low areas. Northern Illinois reports no damage.

DISEASES

PEACHES

Continue control sprays for peach scab. The developing fruit must be protected until approximately 40 days before harvest. The early bloom this year may make additional sprays necessary. The Benlate label suggests that the last
spray necessary to control this disease should be applied two weeks after shuck-fall. We recommend that you count back 40 days from the harvest date of each cultivar, and then adjust your spray schedule accordingly.

APPLES

Streptomycin sprays to control fire blight should begin in Area C and should continue until petalfall at 4-day intervals in Areas B and C. In Area A, the spray intervals can now be extended to 7 days. The extended bloom could foretell a fire blight epidemic this year. Control measures for rust and mildew must be continued until at least third cover. In areas where mildew is severe, we suggest special vigilance. The first scab lesions are being observed in Areas A and B. These lesions are ready to sporulate and to begin the secondary (conidiaspore) cycle. Control measures must be continued.

INSECTS

In Area A, growers should look for rosy colored aphids in curled leaves soon after petal-fall on apples to make sure they have been controlled. A few green aphids are not dangerous, but a single rosy aphid can misshape an apple by feeding on it.

When the weather is dry and spraying intervals are lengthened for fungicides, there is no problem for insecticides. The most commonly used ones have sufficient residual action or they are sufficiently effective when used to knock down newly arrived pests. An exception would be such short-residual insecticides as malathion or parathion, where large numbers of plum curculio were entering the orchard from outside.

Growers in northern Areas C and D should review the earlier reports periodically for comments about conditions related to growth stages. We do not repeat these statements when the growth stage occurs later in the northern areas, unless we feel that specific changes or applications need to be made.

Peach growers in Area A will soon be able to see wilted terminals if any Oriental fruit moth larvae are active. Cool weather will delay and "string out" egg laying by codling moths and, therefore, the larval hatching period.
STAGE OF DEVELOPMENT

Apples and peaches in Areas A and B are in the cover stages. In Area C, peaches are in the shuck stage and apples are just past petal-fall. In Area D, apples are in the pink stage.

CHEMICAL THINNING

Frost damage and the lengthy bloom period are making decisions about chemical thinning especially difficult on Red Delicious and Jonathan. We normally suggest thinning Red Delicious with 1 to 2 pounds of Sevin per 100 gallons of water, applied when the largest apples are 10 to 13 mm in diameter. This year it might be wise to delay thinning a few days. Sevin will have some thinning effect up to 20 days after petal-fall.

Although we usually prefer NAA for thinning Jonathan, a later application of Sevin should remove the smaller fruit without affecting the larger ones.

DISEASES

The dry spring in many areas of the state has greatly reduced disease-inoculum levels for apple scab, rust diseases, and fire blight. If this weather pattern continues for a few more weeks, the incidence and severity of those diseases will be reduced this year. Unfortunately, powdery mildew is having a "banner year" unless control measures are continued. Do not reduce the spray program or expand the spray interval too soon this year. When the rains come, secondary scab and even cedar apple rust could pose a problem. Therefore, we suggest continued control measures for these diseases. All mildewicides except Karathane will control scab. Thus, continued mildew sprays will control apple scab. If not controlled, powdery mildew can greatly reduce the market value of this year's crop and future yields; also, once established it frequently takes several years to obtain control of this disease.

As in normal years, the apple growth stages are delayed in the more northern area compared to the southern part of the state. Thus, scab perithecia are still present and capable of releasing ascospores in the northern half of Illinois. Therefore, scab is still a very real threat, and rust and fire-blight control measures must be continued. A few rainy periods could cause severe problems.

INSECTS

Other than seeing a few caterpillars and some chewing injury where insecticides were not applied before bloom, little activity has been reported or
observed. In Areas A and B, apple growers should begin to watch for red mite development in areas that were infested late last fall or had poor oil coverage, or where red mites normally show up early.

The periodical cicada is due to emerge widely in Area A, so peach growers should be aware that Plictran is now cleared for mite control on peaches. Do not apply before June, and do not use more than 9 pounds per acre in one season. If dosages higher than 4 ounces per 100 gallons are used, only three applications may be used; at 4 ounces, four applications may be used. As usual, check a current label before such applications are made, because the old labels will not have peach use listed. The label does not recommend concentrate sprays on peaches.

Area D growers should check for chewing damage before bloom. Occasionally, an insecticide is required when caterpillar populations are unusually high.
SCORING AND ALAR-ETHREL TREATMENTS

Red Delicious and other vigorous varieties are frequently slow to start bearing and are also slow to settle down into regular bearing. Scoring and Alar-Ethrel applications may help overcome this problem.

Dr. Robert Carlson of Michigan State University suggests scoring vigorous varieties each year. Dr. Max Williams of the USDA station in Wenatchee, Washington, suggests an annual application of Alar-Ethrel on young Red Delicious trees of bearing age.

Scoring should be done about 2 to 3 weeks after bloom. Apply the Alar-Ethrel combination 4 to 5 weeks after bloom. Use 1 pint of Ethrel plus 1 pound of Alar per 100 gallons of spray, or you may use 3/4 pound of Alar, plus 1 pint of Regulaid, plus 1 pint of Ethrel per 100 gallons of spray. Regulaid increases the absorption of Alar, thus a lower concentration is satisfactory. Apply when there will be no rain within 24 hours after application.

After several years of regular bearing, the treatments may be terminated.

Most trees will not require both scoring and Alar-Ethrel treatments. Select the method you prefer, or score some trees and use Alar-Ethrel on others to determine which treatment works best on your trees.

DISEASES

The possibility of a severe outbreak of fire blight is subsiding in Areas A and B, but is still likely in Areas C and D. The apparent absence of this disease does not mean we can terminate control procedures because this disease, caused by a bacterium, can rapidly build up inoculum potential. If warm weather and moist conditions persist for very long, this disease can spread rapidly. The decision to apply streptomycin is entirely dependent upon you, the local weather patterns, your apple varieties, and most importantly whether you have even one blighted blossom cluster or twig terminal in your orchard. We suggest continued streptomycin sprays until the middle of July.

Apple powdery mildew infections are widespread, and in many localities they are severe. The relatively cool, dry spring has favored powdery mildew development. This disease will build in intensity and severity until terminal buds form and leaf tissue matures, or until 80°F. temperatures become common (about fourth cover). The outbreak of this disease may be more severe than it now appears to be. Next spring many twig terminals may be mildewed or dead. Continue spraying to control mildew until at least third cover. Perhaps an additional spray or two would be wise this year.
The rains have come to many areas in the state. These rains should cause new infections of both the rust diseases and apple scab. Continue rust control sprays until third cover or until the galls on nearby cedars are exhausted. Scab control must be continued until August. Spray intervals can be adjusted for the amount of primary scab present and the local weather conditions.

Primary scab lesions are sporulating in Area A. Growers in Area D who use captafol (Difolatan) are reminded to supplement their spray programs at either pink (just before the blossoms open) or petal-fall (when 70 to 75 percent of the petals have fallen), depending upon the rate used early in the spring (see earlier issues of this report).

STAGE OF DEVELOPMENT

In Area A, the first drop of peaches is occurring, and second cover sprays are on or are being applied. In Area C, peaches are shucking off, and apple calyx are beginning to close. In Area D, apples are late pink and going into bloom.

ANOTHER LATE FREEZE

Growers in Areas B through D were threatened on the night of April 26 with lows of 28° to 30°F. In Areas C and D, temperatures dipped again the next night to 26°F. Early indications were that only the most advanced Red Delicious were damaged in Area D. Near Urbana, a low of 26°F. at ground level severely damaged strawberry bloom.

Rainfall prior to this freeze has been adequate over most of the state with 1.5 to 4 inches reported at various locations. East-central Illinois has had only about 1/4 inch.

INSECTS

Curculio and codling moth populations should be past their peak in Area A and just reaching peak numbers in Area B. In Area C, entrance into the orchard is just getting well under way. No unusual pest control problems have been reported.

The big event of the year in insect control, the emergence of Brood 23 of the 13-year periodical cicada, should begin soon in Area A. This brood is very widespread in the Mississippi Valley south of Illinois. Records show that characteristic swarms have been reported in the following counties: Alexander, Crawford, Edwards, Hardin, Jackson, Lawrence, Madison, Marion, Perry, Pulaski, Randolph, Union, Wabash, Wayne, and Williamson. They have been reported in smaller numbers in the following counties: Edgar, Gallatin, Jasper, Jefferson, Johnson, Macoupin, Pike, Richland, St. Clair, Scott, Washington, and White. The females do not begin laying eggs for 6 to 7 days after emergence, so growers should record the date when they first see significant numbers appearing and then either wait 6 days or watch for the first evidence of egg laying before applying the first control sprays. We will ask all growers to make note of where and when swarms appear. We will include a report form in a later issue and ask you to fill it out and send it to us.

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FROST AND FREEZE INJURY

Repeated frosts and freezes continue to damage the apple and peach crops in Illinois. To date, the southwestern and central areas have been hit the worst, but the northern areas face two to three more weeks of possible damage. Orchards in Union, Jackson, and surrounding counties should now be past the frost-damage season. Both apple and peach trees have fair to good crops, except in low areas and on biennial-bearing apple trees which did not have sufficient bloom. Some regular type Red Delicious trees did not set well, but the spur-type red Delicious trees have an adequate set.

Chris Doll estimates the apple and peach crops in St. Clair County at 40 to 50 percent of normal. Jersey County will have no peaches, and only 15 to 20 percent of a normal apple crop. For Calhoun County, he estimates the peach crop at 25 percent and the apple crop at 25 to 30 percent. In Bond County, the apples and the peaches were heavily damaged. The losses in Pike and Adams Counties were lighter, but trees in lower areas were damaged heavily.

At Urbana and in east-central Illinois, considerable damage has occurred. Golden Delicious, usually one of the more hardy varieties, has suffered extensive damage. In one orchard, the Golden Delicious apples are splitting open. Jonathan, Red Delicious, and the summer varieties also have been damaged. Peaches appear to have survived the freezes, but are now starting to drop.

Preliminary reports from Michigan indicate some losses for both apples and peaches.

DISEASES

Some very difficult decisions need to be made by many growers concerning fungicide-bactericide sprays on frost-damaged orchards. Fungicide sprays on peach orchards with no crop can be terminated. If you stop spraying now, be sure to apply a peach leaf curl spray next spring. Sprays on frost-damaged apple orchards can be terminated if you have reasonable control of scab, fire blight, and powdery mildew. If you have a significant amount of powdery mildew, continue control measures until at least the third cover stage.

Growers with partial apple and peach crops need to base their spray-schedule decisions on the percentage of the crops remaining, the additional costs of bringing such crops to market, and the anticipated market prices. Each grower must make these decisions individually.

INSECTS

Cool weather lengthens or strings out the period of activity by insects, but seldom increases the severity of the damage. Curculio takes longer to complete
the process of coming out of hibernation and entering the orchard. Codling moths take longer to lay eggs, but probably will lay fewer of them. Scale insects develop more slowly, but will continue to put out a regular supply of crawlers after the third cover. Mites will also develop slower, but will continue to increase in number.

In Area A and B where the thirteen-year periodical cicada is expected and Sevin will be used for control, growers could help the mite predators survive the Sevin by not mowing the ground cover at least on one side of the row, thus providing protected spots. Sprays on the trees do not penetrate tall ground cover well, and this would provide the predatory mites with a place in which to survive during the time the cicadas are out.

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BORON NUTRITION

In Report No. 3 we discussed boron nutrition and suggested adding 1 pound of Solubor per 100 gallons to a pre-bloom spray one of the early covers. It is now time for this second boron application in Areas A and B.

CALCIUM NUTRITION

To help reduce bitter pit in Red Delicious and Jonathan spot on Jonathan, we have suggested three calcium foliage sprays, one each in June, July, and August. Because of the early development this year in Areas A and B, we suggest advancing these sprays to May, June, and July. See the notes under calyx and first-cover sprays in the commercial spray schedule.

ALAR-ETHREL TREATMENTS

In Report No. 7 we discussed scoring and Alar-Ethrel treatments for encouraging regular bearing on young Red Delicious trees. It is now time for Alar-Ethrel treatments in Areas A and B.

ALAR ON PEACHES

The growth regulator Alar can be used on peaches to advance the date of harvest and to make ripening more uniform, thus requiring fewer pickings. Our experience has been that Alar advances the harvest of Redhaven 2 or 3 days and most of the fruit can be picked in two or three pickings. The harvest of later varieties such as Redskin is advanced 4 or 5 days. Alar is not very effective on varieties ripening before Redhaven.

If you wish to spread the harvest of a variety, you could treat part of the planting for early harvest and leave the remainder untreated for later harvest.

Apply Alar just before pit hardening—when the peaches are loose and ready for pole thinning. Peaches in Area A are in this condition now. Use 1-1-1/2 to 2 pounds of Alar per 100 gallons of water. Fully wet the trees until they drip. Do not use concentrated sprays. Apply when there will be no rain for 12 hours following treatment.

PEACHES ARE LOOSE IN AREA A

Peaches are loose in Area A and are ready for mechanical thinning by trunk shakers, Kentucky bumpers, and pole thinners. Peaches will not remain loose very long. Where it is needed, thinning should have a high priority on your time schedule.
APPLES

Fruiting apple scab lesions are appearing in unsprayed abandoned orchards and on ornamental crabapples but not in commercial orchards. New reports of powdery mildew are still being received, and the twig blight phase of fire blight is appearing in both Areas A and B. Generally the disease situation in many areas of the state is low.

Many growers experienced significant amounts of sooty blotch and fly-speck on apples last year. These two fungal diseases do little damage to the fruit, but they lower the market value (reduce grade) by their presence on the surface. Infection occurs at any time during the growing season, but cool (65°F.), rainy weather, especially in May and June and again in early fall, is essential for disease development. Infection can occur now, but development will be suppressed during July and August because of hot weather (85°F.), and then symptoms will appear at or just before harvest. New infections can also occur in September. Both diseases are easily controlled with fungicides. Generally these diseases appear only in poorly sprayed orchards or in orchards where the spray program is stopped too early in the season.

PEACHES

Early peach varieties are approaching harvest in the more southern areas of the state. Now is the time to renew spraying for brown rot of fruit. Controlling brown rot on early-maturing varieties reduces the inoculum pressure on later varieties. Sulfur or benomyl will control this disease if applied weekly beginning 3 weeks before harvest.

STAGE OF DEVELOPMENT

By May 11 Area A was getting third-cover sprays on and second-cover was going on in the northern part of Area B. With the extended bloom, many growers are not quite sure what to call the current spray application, but first cover was being applied in Area C. In Area D red apples are mostly into petal fall. In extreme northern Illinois, Goldens were in full bloom on May 9.

INSECTS

Mesurol, a 75% WP which is produced by Chemagro, has received label approval for use on cherries and peaches against European red mite and plum curculio. The rate is 1 to 1-1/3 pounds of Mesurol per 100 gallons of water. For cherries do not apply more than three times per season or within 7 days of harvest. For peaches do not apply more than four times per season or within 21 days of harvest. Mesurol has been shown to repel birds when applied to certain fruit crops, including cherry.

On May 4 at Fieldon there were 20 to 30 red mite eggs for each adult female present. Eggs were only beginning to hatch. This high egg production is well underway in Area C, and adults will just be reaching maturity in the areas where C and D join. In Area A the first of the second generation will be reaching maturity. Growers in this area should make a careful observation of the mite situation as the periodical cicada begins to emerge. In Area A the lesser peach tree borer normally reaches a peak of emergence during the third to fourth week in May. With the season still early, now is probably the best time to apply the first borer spray. Area B growers who do not have crops should apply the last two borer sprays to maintain control during the season.
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TWILIGHT MEETINGS

Tuesday, May 25......Roy Newman's Orchard, Martinsville. Meet at the orchard 1 mile north and 1 mile east of Martinsville at 6:30 p.m.

Wednesday, May 26......Nugent-Schapanski Orchard, Grafton at 7:00 p.m.

CROP PROSPECTS

Orchards in Area D appear to have survived the series of frosts and freezes reasonably well. Apples are now approaching the size for chemical thinning. The prospects for an apple crop in Area A also are good, although the trees on lower elevations have lost some or all of their crops.

Crop prospects in Areas B and C vary greatly among orchards, varieties and locations within the orchard. Some orchards will have no more than 10 to 20 percent of a crop. Others may have as much as 60 percent of a crop. Regular Red Delicious trees are very light. The spur-type Red Delicious trees have a light to fair crop. The Golden Delicious and Jonathan crops will be light to fair.

Peach trees in Area A have good crops. In Areas B and C, freezes eliminated the crop in some orchards, but most orchards will have from 30 to 75 percent of a crop. Some varieties in some locations will require thinning. At Urbana, Reliance is the most hardy variety this year against both winter cold and spring frosts.

Most areas of the state have received good rains within the past ten days. Hail hit three orchards in the Anna area on May 16.

PEACH CROPS IN THE SOUTHEAST

South Carolina expects a slightly larger peach crop than last year. Georgia's crop will be double last year's crop; but in North Carolina, the crop will be about half that of last year. The total crop from these three states is estimated at 460 million pounds for 1976, compared to a 1975 crop of 335 million pounds.

DISEASES

Enclosed is a program we received from Dr. Paul Steiner of the University of Missouri concerning an Armillaria root rot meeting in Campbell, Missouri. Since our major peach production areas are adjacent to Missouri, it might be extremely informative and worthwhile for some of you to attend this
meeting. Preliminary results from a few recently received peach and apple soil samples indicate significant nematode levels. Nematodes are small, nonsegmented worms that parasitize the roots of many plants and are thought to be associated with the peach-replant problem. Perhaps the orchard fumigation demonstration might be especially worthwhile. The techniques that will be demonstrated are ones commonly used to control both nematode and fungal problems.

INSÉCTS

San Jose scale had matured by May 12 in Area A, but were not producing crawlers. This makes them a little late compared to apple development; but para-thion or diazinon will kill San Jose scale now as well as later. Dead adults don't produce crawlers. You will need to wait at least a week to see the first crawler injury on this year's water sprouts.

To find San Jose in a block where you noticed some damage last year, look for the occasional limb that sticks way up into the top center or is high and behind another limb which cuts off the air from the sprayer. This high limb was either topped several times to hold it down or a lot of short stubs were left in pruning side branches or in thinning out. Such limbs really should have been eliminated, but weren't. Now it has many water sprouts and is a regular sanctuary for wild animals like San Jose. Either take your magnifying glass up there or cut off a couple of stubs with fresh sprouts and get them in good light to examine. Scale won't "holler ouch," so you must lift the cover with a sharp point or smash the scale and see the yellow goo to find live scale. New crawlers will eventually cause characteristic purple spots where they set to feed on new growth. If you see the small purple spot but not scale, they are dead; once they start feeding, they do not move. Purple stain under live bark does not mean live scale present, since it takes at least a year for the stain to leave.

Codling moth will proceed just a bit late on the schedule shown in the fruit calendar, and will be strung out.

Someone "blew the trumpet" and the periodical cicada began emerging May 15, just a few days earlier than last cycle in 1963. No large numbers have been reported, but figures can be estimated by examining the ground in suspected areas. The cicadas have had tunnels to within a quarter of an inch of the surface for more than a month. Critical areas are where new trees are planted in land that had large trees thirteen years ago, or near present large trees.

Females start laying eggs, the greatest cause of damage, about 6 days after emergence. Once mature, the females will fly with the wind. They begin laying eggs within seconds after landing on new trees. Trees under four years old may have main scaffold limbs damaged beyond use; so if you have high potential infestations and very young trees, you might want to get your wife scouting about for the cheapest open-weave cloth available and just cover the young trees. Fasten the ends with a clamp clothespin or a twisty around the trunk. The trunk is not in great danger if it is relatively straight up. The cicadas they like a 60° angle to the horizontal or less. Don't procrastinate. It takes several hours for 2 pounds of Sevin 50 WP per 100 gallons dilute or your concentrate equivalent to knock the periodical cicadas out of a tree. Protection will be needed most down wind from large trees, and who knows which way the wind will be blowing.

Make sure the young trees have a protective spray before wrapping. The cloth may tend to hold moisture and will need to stay on at least two weeks. The
open weave could be up to 1/4 inch, and light colors could be preferable. On older trees, Sevin is effective for about 5 days. If the cicadas are only coming from under the trees, a regular 10- to 12-day schedule will be adequate. If they are drifting in from nonsprayed areas, you will need to watch closely and spray more frequently. This may only be required on border rows.

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Armillaria root rot is a fungus disease which has developed to serious proportions in many Southeast Missouri peach orchards. The purposes of this meeting are to (a) define the problem as it now exists, (b) consider the potential for tree losses in the near future, and (c) to acquaint growers with the methods and materials necessary for control.

Although the meeting is primarily directed towards the control of Armillaria in peach orchards, many of the methods are directly applicable to replant problems associated with fungi and nematodes in other fruit crops.

**Morning Program:** Missouri Fruit Growers Exchange on Route WW North of Campbell, Missouri

- **9:00** - Introduction - Henry DiCarlo, Area Horticulture Specialist
- **9:10** - Impact of Armillaria Root Rot on the Missouri Peach Industry - Carlton Stewart, Area Fruit Grower
- **9:30** - An Overview and Statement of the Armillaria Problem - Paul W. Steiner, Plant Pathologist, University of Missouri
- **10:00** - Aspects of Fumigation for Armillaria Root Rot Control - Harold Lembright, Development Specialist with Dow Chemical Company, Walnut Creek, California
- **11:00** - Break
- **11:15** - Special Problems and Safety Precautions with Soil Fumigants - Harold Lembright
- **12:00** - Lunch Break

**Afternoon Program:** Stewart Fruit Company Hillcrest Orchard, Route WW, Campbell, Missouri.

- **1:30** - Orchard Fumigation Demonstrations: Tree Site Fumigation, Fumigation Under Tarp, Tractor Injection Method.
- **4:00** - Adjourn
Plan to attend the Summer Orchard Field Day of the Illinois State Horticultural Society, June 10 and 11. The program will start with a noon lunch on June 10 at the Edwards Orchard in Poplar Grove. Equipment demonstrations and a tour of the orchard and facilities will follow. On June 11, following breakfast at the Bell Orchard in Barrington and a tour of the orchard, the group will proceed to Waucanda Orchards to see that orchard and have lunch.

POWER TAKE-OFF SHIELDS

New OSHA regulations concerning shields for power take-off drives go into effect on June 7. For specific information, contact your county Extension Adviser in Agriculture.

CHECK PEACHES IN AREA C

Peaches in Area C should be approaching the loose stage. At that time, they can be thinned with Kentucky bumpers and poles.

DISEASES

PEACHES

Brown rot of stone fruits will become an increasingly important problem as the season progresses and as the early varieties ripen. During the ripening process, starch in the fruit is converted to sugar. The fungus thrives on the accumulating sugar. Controlling brown rot on early varieties reduces the inoculum potential, that is, the number of spores which can infect varieties that mature later.

APPLES

Fire blight and powdery mildew are locally severe. Growers whose orchards have a history of mildew should consider an additional one or two cover sprays with a mildewcide. Continue powdery mildew control measures until terminal growth stops. Areas B and C are showing unacceptable levels of fire blight.

Streptomycin sprays must be continued until July in orchards where terminal blight is obvious.

INSECTS

Area A is still at least a week or more behind the Illinois Fruit Calendar, while Area D is only 5 to 6 days behind in development. Codling moth and Oriental fruit moth were strung out by the cool weather, but the development of codling moth in Areas C and D will be more normal, with hatch beginning this week in Area D.
In Area A, periodical cicada (often called locusts) are beginning to emerge and to sing. In several locations, the numbers were quite high in orchards where there were large trees in 1963 and continuous trees since then. But in adjacent timbers where cicada numbers were high in 1963, there was very little emergence. Emergence may have been delayed. If the pattern remains light, this will lessen the control problem considerably.

When using Sevin for control, 2 pounds of 50 WP is adequate. Sevin is a good insecticide and others will not need to be applied with the Sevin, unless you have a known problem such as high plum curculio or aphid populations.

Second-generation red mites are beginning to reach maturity through Area B and into Area C, yet the majority are in the "hard-to-see," immature stages. Dry weather generally helps them. In Area A, the second generation is now grown enough to be seen more easily than before and will be dispersing generally, except for the tender leaves on the ends of rapidly growing shoots. If mites are present in moderate numbers or higher in your judgement where Seven is being applied, you might as well begin adding miticides. Use half to full dosage, depending on how high you think your population is. Miticides that are harmful to predators may be used with the Sevin, since they can't hurt predators more than Sevin.

Entomologists would like to collect records on the location of the periodical cicada. We would appreciate your filling out the attached form and returning it to help us map the brood and help "remember" where to expect them next time. If you only see a few and are not sure they are periodical cicadas, either go see a swarm some place or send in wings or specimens for identification. These periodical cicadas are smaller than the annual ones we see each year, and have dark bodies and red eyes.
BROOD XXIII
Periodical Cicada

Dates: 1st observed ____________________ 1st hear singing _____________
last observed ____________________

was singing during: AM ___________ PM ___________ Both _________ Night ___________ 

How many did you see: Few individuals __________
Moderate swarms __________
Thick swarms __________

The number of emergence holes per square foot would be a good figure.

Location: Give the direction and distance from a town large enough to have a post office or from a town and a highway route. If a swarm, give direction and distance it extended.

Please return to: Ronald H. Meyer
163 Natural Resources Bldg.
Urbana, IL 61801
No. 12--June 6-12, 1976

This is the last weekly Spray Service Report. The reports will now be published every two weeks. We hope to see you June 10 and 11 at the Summer Orchard Field Day sponsored by the Illinois State Horticultural Society. It starts Thursday June 10, with a noon lunch at Bob Edward's orchard near Poplar Grove.

STABILIZING LOOSE TREES

Thundershowers accompanied by gusty winds sometimes cause young trees to become loose in the ground. The easiest way to stabilize young trees is to mound gravel or sand around the trunk. Pea gravel is the preferred material, but small-size crushed stone with the fines removed is also satisfactory. Gravel provides a firmer support than sand.

REMOVE SUCKERS AND WATERSPROUTS TO IMPROVE FIREBLIGHT CONTROL

On varieties susceptible to fireblight, watersprouts and suckers are especially vulnerable to fireblight infection because of their vigorous, yet tender growth. If a watersprout arising from a scaffold or the trunk becomes infected and the infection moves into the scaffold or the trunk, the scaffold or even the entire tree may be lost. You can prevent this problem by jerking watersprouts and cutting out suckers.

DISEASES

Reports are increasing about infestations of the shoot blight phase of fireblight. The rains and thundershowers over the past weekend provided conditions for a new wave of infection. Where fireblighted terminals are present in susceptible varieties, weekly streptomycin sprays should be applied during the month of June.

INSECTS

The periodical cicadas are well into the egg-laying phase in Area A, and it appears that most have responded to the "trumpet call" and emergence is complete. There seem to be exceptions, but the numbers appear to be considerably lighter in wooded areas than they were 13 years ago. In orchard areas, there have also been variations in the experience of 13 years ago. If you have not sent in the report form from the last report, please hold it until you last see the cicada so we get the dates for the end of the brood. Add any comments you can about the change in abundance in the timber from 13 years ago.
Some parts of the state have had heavy rains, which is a plus for mite control in that some are blown away and washed off. Do not depend on this for control, however. Continue a close watch so that mite numbers don't build up quickly and surprise you. You will have more confidence if you are aware of what is happening.

Insect control is generally in good shape. We have no reports of any unusual activity.

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ALAR APPLICATIONS

For response on the current apple crop, the growth regulator Alar should be applied 60 to 75 days before the normal harvest date. Applications on Red Delicious, Jonathan, and Golden Delicious should be made before July 5 in Areas A and B and before July 20 in Areas C and D.

Alar serves as a stop-drop material, increases the firmness of the flesh, improves storage life, delays the development of water core, and increases the color of red varieties. Alar delays maturity about 5 days and reduces fruit size slightly. It also delays the change of Golden Delicious skin from green to yellow. It is most useful on the red varieties.

Since Alar delays maturity a few days, many growers use it on part of their plantings of Jonathan and Red Delicious to spread out harvest. Do not use Alar on apples to be harvested for the early market unless Ethrel is to be used on them later. Alar applied 60 to 75 days prior to the normal harvest date followed later on by Ethrel has proved to be a good combination.

Alar is especially helpful on apples going into cold storage and on Starking Red Delicious. The delayed maturity helps Starking develop more color.

On trees with normal vigor, apply 3/4 pound of Alar alone or 1/2 pound of Alar plus 1 pint of either Regulaid or Tween 20 per 100 gallons of water. A higher concentration is needed on very vigorous trees. On such trees, apply 1-1/2 pounds of Alar alone or 1 pound of Alar plus 1 pint of either Regulaid or Tween 20 per 100 gallons of water. Do not apply Alar on weak trees, on trees carrying an excessively heavy crop, or on trees under moisture stress because of drought. Both Regulaid and Tween 20 increase the absorption of Alar, thus enabling lower concentrations of the material to be used.

Apply Alar when no rain will occur within 12 hours after application. Do not mix Alar with other spray chemicals.

ALAR FOR STOP-DROP ON MCINTOSH

Alar is the most effective stop-drop material for McIntosh. In Area D, apply Alar during the first two weeks in July. Use the rates suggested above.

DISEASES

PEACHES

In those areas of Illinois fortunate enough to receive rain, bacterial spot is occurring. This disease causes the defoliation of infected leaves and a
checking or cracking of the skin of infected fruit. No effective control measure exists, but fruit infections may be reduced by sprays of captan (1 pound) and Cy-
prex (1/2 pound) per 100 gallons.

As the threat of peach scab diminishes near harvest, the threat of brown rot increases. Therefore, continue control measures for brown rot at weekly in-
tervals. Read all pesticide labels carefully and follow all harvest restrictions.

**APPLES**

The summer diseases (black rot, Bot rot, sooty blotch, and flyspeck) will all need control during the summer. Black rot and Bot rot are often prob-
lems in orchards with poor sanitation. Such orchards characteristically have old
trees, dead limbs in trees, and/or last spring's prunings either still in the or-
chard or piled up but unburned in the vicinity of the orchard. For the diseases
listed, several organic fungicides will reduce the severity, but none are ex-
tremely effective unless the spray program is combined with good orchard sanita-
tion. PhalanX beginning at the fifth-cover stage will control Bot rot.

Flyspeck and sooty blotch were observed throughout Illinois in 1975. These diseases can be controlled easily by not terminating spray programs too early.

**MITES AND INSECTS**

In Areas A and B, the populations of red mites are increasing rapidly. Since this has been one of those years when unusual things are happening, grow-
ers should watch more than the normal areas where mites show up first. With the
use of Sevin in the cicada-emergence area, red mites may show up on fruit trees. If more than one application of Sevin was used, mite control will surely be needed. Don't wait nearly as long as you do when Sevin has not been used to apply miti-
cides to a developing population. They will increase more rapidly since there will
be fewer predators restraining them.

Strong red mite populations are building at Urbana in the usual areas. Very little mite activity was found in orchards at the Horticulture Field Day
last week in Area D. Codling-moth activity should have reached a peak by now in
Area D, and the warm weather will cause it to progress rapidly. Apple maggots
normally begin to emerge at this time. In another week or two, the flies may be-
come visible on unsprayed trees.

San Jose scale has been quite active in southern Illinois. Growers
should observe problem areas regularly for small, red dots on new growth—indicat-
ing the presence of the scale. These dots will remain visible all season, so
regular observations will reveal significant changes; if any.

Two additional locations were found for white apple leafhoppers this season. They are apparently developing resistance to phosphate insecticides, so
we would like to hear about any new populations.

As the cicadas disappear, we ask all those who receive this report in
Areas A and B to note the last date when they were seen or heard. Please send in
this information. Negative reports would also be useful; that is, if you live in
Area A or B and did not hear of any cicadas in your immediate area. A few emerged
in Allerton Park near Monticello; also, at Mahomet and Clinton in Area C. Positive
reports are welcome from everyone. If you are not sure, send in specimens or wings
for identification.

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LEAF ANALYSIS

Leaf analysis is an effective tool for checking the nutritional status of fruit trees. As in any testing system, samples must be carefully taken and processed if they are to accurately represent the nutritional condition of the trees.

The ideal time for taking samples is from July 1 to August 15. Each sample should be taken from trees that are about the same age and of similar vigor, appearance, and crop load. After collection the sample should be spread out and allowed to air dry.

Leaf sampling kits may be obtained from the Pomology Division, Horticulture Field Laboratory, University of Illinois, Urbana, IL 61801. Request one kit for each sample you wish to take. The kit contains instructions for taking, drying, and mailing the samples.

CHECK YOUNG TREES

Red-banded leaf roller, tentiform leaf miner, grasshoppers, and other chewing insects can defoliate young trees. Leafhopper feeding reduces the efficiency of leaves. Damage to the bark of the young shoots by Buffalo treehoppers can seriously reduce growth. Since young trees are not usually included in the regular spray program, check them periodically and apply insecticides when needed.

DISEASES

APPLES

Just a few reminders. The twig blight phase of fireblight can continue to be a problem even in July. Similarly, powdery mildew infections will continue to occur until terminal growth stops.

PEACHES

Several peach growers in Southern Illinois have described and sent to us fruit with a skin disorder. We have diagnosed this malady as anything from spray burn to frost injury. Recent evidence suggests that the skin blemish may be powdery mildew or perhaps "rusty spot" of peach.

The earliest symptoms on the fruit are small spots 3 to 5 mm (1/16 to 1/8 inch) in diameter, in which the hairs are an orange-tan color. Infections first appear on the fruit about 2 weeks after shuck split. As the spots enlarge the margins of the lesion advance and may involve up to 50 percent of the fruit surface. Near harvest the orange-tan fuzz is shed, leaving the spot bald and reddish-brown in color.
If you are observing similar symptoms on your peach fruit, please send a few specimens to: Steve Ries, 1 Horticulture Field Laboratory, Urbana, IL 61801. Please include a note with the fruit explaining the varieties attacked, the percentage of the fruit affected, and when you first observed the symptoms. This information will aid us in preparing next year’s spray program.

INSECTS

The periodical cicada are through laying eggs. Please send in your report from Spray Service Report #11 to Ron Meyer.

The mite populations in Areas A and B are rapidly growing where their natural predators have been destroyed. Look for rapid increases in mite populations where you have used Sevin.
DISEASES

APPLES

Rust lesions of leaves and fruit are sending spores back to infect cedar trees in the vicinity of orchards. These cedar trees will reciprocate by furnishing spores to infect apple trees in the Spring of 1978.

The powdery mildew fungus is also preparing for winter by invading buds where it overwinters. Nothing can be done to reduce bud infection but to resolve to prune out infected buds this spring and to be more conscientious when spraying next year.

Fire blight spread will decrease as long as high temperatures prevail but still poses a threat in infected blocks especially if cooler, wet weather accompanied by wind or hail occurs.

As harvest approaches check all pesticide labels and adhere to the harvest restrictions.

PEACHES

The peach harvest in Area A is in full swing. There are no time restrictions concerning the use of Benlate on peaches and nectarines. Benlate gives outstanding control of brown rot if applied on a seven-day schedule prior to harvest. Benlate will not control Rhizopus rot, therefore Botran is recommended for use in the hydrocooler water.

We believe that it is very important to control brown rot on varieties that mature early. If brown rot is not controlled on early peaches, inoculum (fungus spores) can build up and be easily spread to adjacent, later-maturing varieties.
USE AMMATE X TO CONTROL POISON IVY

Ammate X is the most effective material registered for controlling poison ivy in apple orchards. Ammate X is non-selective in action thus the material must be kept off of apple foliage and the bark of young trees.

Apply as a spot treatment with a course spray wetting the ivy foliage. Ammate is most effective when the weather is warm or hot and the ivy is in full foliage. Use 60 pounds of Ammate X plus 4 fluid ounces of spreader-sticker per 100 gallons of water.

INSECTS

Second brood codling moth hatch is well underway in Area A but because of early cool weather it can be expected to be so strung out that there will be a small amount of emergence into the third brood. There is probably no more hatch in Area D as first brood has been completed. Insect control has generally been good and plum curculio has not had high populations for several years but they are native insects and may increase on wild hosts. A good way to watch for both curculio and apple maggot is to locate and occasionally check unsprayed fruit trees.

Growers who have had San Jose scale should remember to occasionally look over the top center of trees that were infested particularly as spray intervals are increased.

Mite populations have most likely gone through a rapid increase and a leveling out in most of the state. If you have had to apply mite control then you should keep the areas sprayed under close observation until you do see either predators present or some indication that the population is not rapidly increasing. Peach growers harvesting early varieties should not neglect taking a look at later varieties for mite development.

Peach growers should also not neglect to include planning a borer spray soon after the various varieties are harvested. Area B and C growers should be aware of the apple maggot situation as they lengthen and bring their spray schedules to a close. Again, unsprayed fruit trees nearest the orchard are the best indicators.
Aphids have recently suffered high losses due to the normal fungus disease that is activated by warm, humid weather. Young grasshoppers are increasing in size. Growers with young, infrequently sprayed trees should look at the grasses in drainage ditches and other such breeding grounds to make sure young trees won't be stripped by grasshoppers moving to the trees.

Ron Meyer has received very few reports from the periodical cicada area. He will need them very soon or not at all.
APPLE CROP ESTIMATES

An apple crop of 146,000,000 bushels is forecast by the first USDA apple crop estimate for 1976. This is 14 percent less than the 1975 crop and 6 percent less than the 1974 production.

The greatest reduction is in the central states, where this year’s crop is estimated to be 27 percent below the 1975 crop. The reduction in the eastern states is estimated at 20 percent, whereas the reduction in the western states is expected to be only 2 percent.

STOP-DROP SPRAYS

NAA (napthalene acetic acid) and 2,4,5-TP (color-set, color fix, and the like) are both cleared for use as stop-drop sprays on apples. Do not combine 2,4,5-TP with the brush killer 2,4,5-T.

NAA takes effect in 2 to 4 days and is effective for about 7 to 10 days. Use 15 ppm for fall varieties (Jonathan, Delicious, Golden Delicious), and 20 ppm for winter varieties (Winesap and Rome). Do not make more than two applications. NAA should not hasten maturity.

2,4,5-TP takes effect in about 7 days and is effective for 14 to 28 days. It may speed up ripening if it is applied too early or if the weather is hot. Do not apply 2,4,5-TP on summer varieties or on Grimes. Do not use more than one application at 10 ppm on Golden Delicious. Use 10 to 15 ppm on Jonathan and Red Delicious and 20 ppm on Winesap and Rome.

Some growers have had good results with a combination spray of NAA at 10 ppm plus 2,4,5-TP at 10 ppm to give both quick and lasting control. Others have applied NAA at 15 ppm, followed in 7 to 10 days by the combination.

With more of our apples going into storage, the choice of stop-drop materials becomes more important. Generally speaking, 2,4,5-TP is thought to shorten the storage life of apples since it tends to speed up ripening. But the later the 2,4,5-TP is applied, the less the effect on ripening. NAA is preferred for storage apples.

For storage apples we suggest delaying the application of stop-drop sprays as long as possible. Then start with two applications of NAA 10 to 14 days apart, thus giving an effective stop-drop period of 15 to 25 days. If a longer effective stop-drop period is needed on some blocks, apply 2,4,5-TP about 4 or 5 days after the second NAA spray.
Trees that were sprayed earlier with Alar should not require additional stop-drop sprays. If the apples on Alar-treated trees do start to drop, either NAA or 2,4,5-TP may be applied.

**ETHREL FOR ADVANCING MATURITY OF APPLIES**

With favorable weather conditions, Ethrel will advance maturity of apples. It also increases the color of most red varieties and promotes uniform ripening, thus enabling once-over harvest.

Ethrel is most effective when the days are sunny and pleasant (temperature below 86°F.) and nights are cool (temperature below 63°F.). It is NOT effective when hot days and warm nights follow its application.

The best results in Illinois have been on Jonathan and spur-type Red Delicious. Ethrel matures Starking but does not add much color, so it is not suggested on Starking. Results with Ethrel on Golden Delicious have been variable.

Ethrel should be applied 10 to 14 days before the desired harvest date for the treated trees. On a specific application day, do not treat more trees than can be picked during a 2- or 3-day harvest period. Treated apples may get over-ripe or may fall before you can get them picked.

Ethrel loosens apples, so NAA (15 ppm) or 2,4,5-TP (15 ppm) or a combination of NAA (10 ppm) plus 2,4,5-TP (10 ppm) must be applied with the Ethrel. Amchem also suggests adding a surfactant (Tween 20, Triton B-1956, X-77P) at the rate of 2 ounces per 100 gallons.

Apples previously treated with Alar may be treated with Ethrel if NAA or 2,4,5-TP or both are applied with Ethrel. Alar alone will not prevent Ethrel-treated apples from dropping.

Ethrel-treated apples should go to market promptly instead of into prolonged cold storage.

**DISEASES**

**APPLES**

Only the summer diseases now pose a serious threat to this year's harvest. Continued control is suggested for black rot, bitter rot, Bot rot, fly speck, and sooty blotch.

**PEACHES**

Continue brown rot control measures. Mixing Benlate with another brown rot fungicide (captan, sulfur, or dichlone) is suggested to avoid the buildup of resistant races of the brown rot fungus. Observe all harvest restrictions. There are no time restrictions for captan, sulfur, or benomyl, but dichlone is not registered for use on nectarines and has a 7-day waiting period from the last spray until harvest.

Growers who have observed "rusty spot," described in Spray Service Report No. 14, 1976, in their orchards are encouraged to contact Dr. Steve Ries, Horticulture Field Laboratory, Urbana. Let us know which varieties are affected. Pay special attention to the mid-through late-season varieties.
INSECTS

Mite populations have probably reached a peak by now in most orchards although healthy leaves and a complete absence of predators could allow them to increase at any time throughout the season. Matching past experience with your present conditions is the most reliable guide. With no experience, constant vigilance is in order.

Northern growers should be aware that apple maggot potential for infestation continues through August. Before stopping spray schedules, they should know the maggot situation in their orchards.

Peach growers are urged to get a borer spray on varieties they have finished picking, being careful to get good coverage on all gummy, wounded, or rough bark areas on all parts of the tree down to branches 1/4 inch in diameter.

Apple growers are reminded to be aware of their San Jose scale situation as they lengthen spray intervals or stop spraying. San Jose activity continues well into October.

Stephen M. Rizz
Assistant Professor of Plant Pathology

Ron Meyer
Fruit Entomologist

Daniel B. Meador
Extension Horticulturist

Malcolm C. Shurtleff
Extension Plant Pathologist

Roscoe Randell
Assistant Professor of Agricultural Entomology
The Board of Directors of the Illinois State Horticultural Society at its June meeting voted to continue the Quality Apple Club for one more year. The judges were delegated the authority to modify the rules and procedures. Judges this year will be an entomologist, a plant pathologist, and a horticulturist.

Because of the frosts and other adverse weather conditions this year, the judging system will be altered. More emphasis will be placed on insect control, disease control, and general orchard management practices. Less emphasis will be placed on frost and hail injury.

Scores will not be published. Certificates will be presented at the annual meeting, but there will not be a first-place trophy.

A news release will be sent to each club member following the annual meeting. The club member may use the news release to inform the local news media.

To be eligible for the club a grower must have at least 500 trees at least 6 years old.

To apply for membership in the 1976 Club send in the completed application form.

Application for the 1976 Illinois Growers Quality Apple Club sponsored by The Illinois State Horticultural Society in cooperation with The University of Illinois Cooperative Extension Service

Name ___________________________ County ___________________________
Address __________________________________________________________________________
Location of orchard to be judged __________________________________________________________________________

Varieties __________________________________________________________________________
Age of trees (must be more than 5 years old) __________________________________________________________________________

A copy of the spray schedule must be provided. It may be attached to this application blank or it may be given to the judges at the time of inspection.

Mail this application to: D.B. Meador
104 Horticulture Field Laboratory
University of Illinois at Urbana-Champaign
Urbana, IL 61801
LAST CALL FOR QUALITY APPLE CLUB APPLICATIONS

The judging for the Quality Apple Club will start on Tuesday, August 24 in southern Illinois. If you live in the southern half of the state, have neglected to send your application in, and wish to enter the competition, please telephone Dan Meador by Monday night, August 23. His office number is (217)333-1522; at home, (217)367-2610. Growers in the northern half of Illinois may still apply by mail.

JONATHAN HARVEST UNDERWAY

The harvest of Jonathan apples started this week in the Union-Jackson county area. Most of the fruit being picked was treated with Ethrel to advance the maturity and color development. The relatively cool weather of the past two weeks has enabled Ethrel to work effectively.

Both peaches and apples matured or are maturing 7 to 10 days earlier than normal this year. The early bloom date and moderate temperatures during the summer probably are the reasons for early maturity this year.

GOOD MARKETING PROSPECTS

With an apple crop estimated at 14 percent below the one last year, marketing prospects are favorable. Washington is expected to have about the same size crop as in 1975, so most of the crop reduction will be in the Midwest and East.

According to reports from Michigan, processors from the East are bidding for apples there. The processors apparently have depleted their surplus carryover, and will be actively bidding for apples. However, prices for the fruit picked the earliest may not be as high as usual. Washington still has a considerable supply of 1975 crop CA storage apples on hand. Washington waited too long before starting to open their CA storages. This carryover CA fruit is holding down prices for early marketings of the 1976 crop.

Considering the entire marketing season, marketing conditions are expected to be favorable. The demand from processors, wholesalers, and retail customers should be brisk.

STOP-DROP MIXTURES

Growers are cautioned to calculate stop-drop mixtures carefully. NAA is marketed concentrations of 3.5 and 7 percent. 2,4,5-TP also is marketed in more than one concentration.
DISEASES

Apple diseases generally are under control. The summer diseases, especially sooty blotch and flyspeck, may require additional sprays, considering the cool weather of recent weeks. Pay special attention to the later-maturing cultivars. Observe all harvest restrictions.

INSECTS

Peach growers should make sure they get a borer application on all peach trees when the harvest is complete. The moths are quite active now, and some egg-laying will continue into October.

Any areas that have had scale in recent years should be thoroughly examined now, before the apple harvest starts. The tops, centers, and most difficult limbs to spray should be checked. If any significant numbers are present, the most readily apparent sign will be new crawlers or small red spots where they have fed on new growth.

Leafrollers and codling moths should be watched where trouble has developed during last seasons in the past, or where their presence was observed earlier this season. The same is true for apple maggots in northern Illinois. Be watchful if you have nearby, unsprayed fruit trees.

Mites should not be completely dismissed. The predators have increased by now in most orchards, but be watchful if you have used new spray materials.
SPRAY SERVICE REPORT-SPECIAL ISSUE
January 19, 1977

You are cordially invited to attend one of the following fruit grower meet­
ings. Dr. Steve Ries, Ron Meyer, and Dan Meador will speak at each of the meet­
ings. The 1977 Spray Schedule will be distributed.

Tuesday, February 1 Southern Horticultural Society, St. Joseph's Catholic Church
Recreational Hall, Cobden, 9:00 a.m. to 3:00 p.m.

Wednesday, February 2 Old National Bank Building (basement meeting room), Centralia,
9:30 a.m. to 3:00 p.m.

Tuesday, February 8 Calhoun Fruit School, Apple Shed, Batchtown, 9:30 a.m. to
3:30 p.m.

Wednesday, February 9 Central Horticultural Society, Holiday Inn, Quincy, 9:30 a.m.
to 3:00 p.m.

Tuesday, February 15 Longhorn Cafe, Martinsville. Dutch treat dinner, 6:30 p.m.;
program at 7:30 p.m.

Saturday, February 19 Northern Horticultural Society, Holiday Inn, LaSalle-Peru,
9:30 a.m. to 3:30 p.m.

The State Strawberry School will be on Tuesday, March 1, at the American Legion Building in Centralia, from 9:00 a.m. to 3:00 p.m.

Due to the increasing interest in commercial production of blackberries, blueberries, grapes, and raspberries, a special meeting for interested growers will be held the night before the State Strawberry School. That meeting will be on Monday night, February 28, at the Langenfeld Hotel in Centralia. The Dutch treat smorgasbord dinner is at 6:30 p.m. The program will start about 7:30 p.m. The program will consist of commercial growers giving their experiences with these crops, followed by a discussion period.

Another meeting of interest to growers selling at retail is the Roadside Marketing Conference at the Holiday Inn in Collinsville on Wednesday, March 23, from 9:30 a.m. to 3:30 p.m.

BITTER COLD AND PEACH TREES

The bitter cold probably has killed most or all of the peach fruit buds. There may still be hope for the survival of some of the hardiest varieties in southern Illinois.
The survival of the trees is much more likely. The dry, cool fall hardened the trees. The consistently cold, winter temperatures have kept them dormant and winter-hardy. There will be some winter injury, undoubtedly, but we expect most trees to survive.

MOUSE INJURY

The prolonged snow cover is causing some growers to be concerned about mouse injury. We contacted Jerry Hull, Extension Fruit Specialist at Michigan State University for his comments, since Michigan growers frequently have prolonged snow cover.

Jerry said that a good mowing and baiting program in the fall before the snow arrives usually will give adequate protection through the period of snow cover. He said there is nothing that can be done to control mice as long as the snow remains. Tramping the snow around the tree trunk and putting bait on top of the snow does not help.

Jerry also said that under the snow cover, mice continue to nest in the sod areas. Thus, bare ground around the trunk is helpful even under snow cover.
If you have not subscribed for the 1977 Spray Service Reports, now is the time to do so. An application form is included at the end of this special report. Please fill out the form, make your check payable to the University of Illinois for $5.50, staple it to the form, and mail to the address listed.

PEACH PROSPECTS

Growers are finding more live peach fruit buds than expected following the bitter cold weather in January. If there is no more winter kill and no severe spring frost, we could have a partial crop. We may learn more about the relative winter hardiness of the various varieties, too.

DELAY PEACH PRUNING

Pruning wounds on peach trees heal more rapidly with less likelihood of canker infection if the cuts are made after growth starts in the spring. So we suggest pruning peaches during the period from the popcorn stage until just after bloom.

NUTRITION

Apples' greatest need for nitrogen is during the early growth and fruit-setting period. To insure an adequate supply in the tree during this time, make a ground application of fertilizer four to six weeks before bloom. If you did not apply nitrogen last fall, get it on early this spring.

Through pruning and fruit harvest, considerable quantities of potassium are removed from the orchard. We suggest an application of 150 to 200 pounds of muriate of potash (60 percent K₂O) every other year on apples and every year on peaches. Adequate to high potassium levels increase the winter hardiness of peaches.

Early nitrogen application is also suggested for peaches, but an application when the leaf buds start to open is also satisfactory. At that time, we have a better idea of crop prospects and fertilizer rates can be adjusted according to those prospects.

DISEASES

Spring is just around the corner. Therefore, the first disease-control sprays will be applied soon. In an "average year," peaches break dormancy during the second week of March in Area A, and the third week in Area B. To prevent a serious peach-leaf curl problem, apply bordeaux, lime sulfur, or ferbam before the buds break. In recent years, many growers have not timed this dormant spray properly. The result was considerable curl. Don't miss this year!
Apples generally break dormancy during the last two weeks of March in Areas A and B, and during the first two weeks of April in Areas C and D. The choice of fungicides in early sprays depends on the cultivar, disease pressure, and area of the state involved.

If fire blight or black rot were problems on your Jonathans last year, consider using a cleanup spray of copper sulfate when the trees are dormant, or bordeaux at green tip.

If apple scab was a problem, control must begin as soon as the green tissue appears. There are several excellent scab fungicides. Two of these are benomyl (Benlate) and dodine (Cyprex). Benomyl- and dodine-tolerant strains of the apple scab fungus have been reported in neighboring states. Therefore, you should not rely exclusively on a fungicide, but should consider alternating fungicides and/or using registered tank mixes.

If you plan to use captafol (Difolatan 4F) this year, you should be aware of the following facts:

1. Two rates of Difolatan are suggested in our spray circular: a 3- or 5-quart rate (per 100 gallons). The lower rate should control scab until pink-bud in a normal year (three weeks), the higher rate until petal-fall (six weeks). Obviously, 1977 is not a normal year! If we encounter a long, wet, cool period between the spray application and the pink-bud or petal-fall stages, scab infections could result. Therefore, be prepared to apply additional scab sprays.

2. Don't prune trees after spraying. Many people are allergic to this material, which produces a skin rash.

3. Difolatan should be applied in combination with the dormant oil. Do not apply the Difolatan and then follow in a few weeks with the oil, because phytotoxicity can occur.

4. Apply Difolatan at or before the 1/4-inch green stage. Spraying after this bud stage can result in leaf burn and fruit russet.

5. Difolatan will only control apple scab. If powdery mildew or cedar apple rust are problems, you might consider using the 3-quart rate until pink-bud, then changing to a fungicide that is effective against these two diseases.

INSECTS

Superior oil is still an effective and economical way of reducing the overwintering of red mite eggs and scale insects. If San Jose scale has been observed in the orchard during the past two years, a thorough application should be made some time before the pink-bud stage. Using oil alone at 2 gallons per 100 gallons of water during the dormant through the 1/2-inch-green period, 1-1/2 gallons through tight cluster, or 1 gallon from tight cluster through pink will kill all of the red mite eggs and scale insects that are covered. Aphid eggs are not all killed, and hatched aphids may crawl between developing leaves and escape.

Situations have been observed where the number of overwintering red mites was low, control during the past season with predatory mites excellent, overwintering cover for predatory mites good, and scale insects absent. Such conditions would indicate a good possibility that an oil spray is not needed. Several of these situations were observed last year where no oil was used and where predatory mites kept the red mites under control easily. Mature orchards are most likely to present these favorable circumstances where ground cover is permitted to grow.
Favorable situations for tarnished plant bugs may exist if the dimples in apples or deep cat-facing in peaches have been a problem and if there are legume fields nearby or clovers or other early blooming ground cover plants in the orchard. These bugs are seldom seen in the trees, but feed on the seed in the base of the bloom. Control must be applied just before bloom. Any orchard insecticide will give some reduction, but those with the persistence to last through bloom will be the most effective. Sevin and Lannate are most effective on plant bugs, and are moderately effective on aphids. However, they are also very dangerous on honey bees, and thus should be applied at least a full day before the first blossom opens.