SPECIAL ISSUE--February 1, 1973

You are cordially invited to attend one of the sectional fruit meetings listed below.

Insect and disease control as well as other cultural subjects on apples and peaches will be discussed at each of these one-day meetings:

Tues. Feb. 6--Ramada Inn, Carbondale, 9 to 4.
Wed. Feb. 7--Old National Bank, Centralia, 10 to 3.
Tues. Feb. 13--Farm Bureau Building, Hardin, 9 to 4.
Wed. Feb. 14--Holiday Inn, Quincy, 9 to 4.
Thurs. Feb. 22--Longhorn Cafe, Martinsville, 6:30 p.m. to 10 p.m.
Sat. Mar. 3--Holiday Inn, LaSalle-Peru, 9 to 4.

If you grow strawberries you may also wish to attend the Illinois Strawberry School on Tuesday, February 27, at the Community Center in Centralia, from 9:20 a.m. to 4 p.m.
No. 1--March 26-31, 1973

This report initiates the series of 1973 Spray Service Reports. During the year we will be referring to Illinois Circular 1073, *Pest Control in Commercial Orchards*; to supplements A and B to Circular 1073; and to Illinois Circular 1014, *Illinois Fruit Calendar*. Circular 1073 is just off the press, and is being mailed to you under separate cover. Supplements A and B and Circular 1014 were distributed at the sectional meetings of fruit growers. If you do not have a copy of any of these, you can obtain them from your county Extension Adviser, or from the Office of Agricultural Publications, 123 Mumford Hall, Urbana 61801. Telephone 217/333-2548.

The unseasonably warm weather throughout Illinois in late February and early March has pushed growth and development about two to three weeks ahead of normal. In southern Illinois, peaches are blooming and apples are in the cluster stage. At Urbana, the peaches are showing pink and apples are in the green-tip stage. At Rockford apples are still dormant.

At the peach pruning meeting held at Street's Orchard, reports indicated that the peach prospects are fair to good in the Midwest, except for parts of Michigan. In Illinois, some of the more tender varieties have suffered heavy bud kill; but the hardier ones have plenty of live buds.

Word has been received that Benlate was granted label approval on March 12 for use on apples.

The warm wet weather favors the infection of scab and collar rot on apples. That weather also makes it hard to get the sprayer through wet spots in the orchard. Therefore, for scab, we suggest 1/2 pound of Cyprex or Benlate per 100 gallons, applied weekly for the duration of the wet weather.

To prevent new collar rot infection on apple trees use maneb at 1 pound per 100 gallons. Apply with a hand gun. Soak the lower two feet of the trunk, also the soil surrounding the trunk. One application in the early spring and a second one in September is suggested. Avoid injury to the trunk caused by machinery and fertilizer burn.

Where mildew is a problem on apples, sulfur should be added to Cyprex sprays for scab. Benlate applied for scab also will control mildew.

For brown rot on peaches, try to make two bloom sprays--one during early bloom and one during the full bloom stage. This is especially important when the
bloom period is prolonged. Use 1/4 pound of Phygon and 3 pounds of wettable sulfur per 100 gallons. On nectarines, use a Benlate program—starting with the bloom sprays.

If the early spring arrived before you were through pruning, finish pruning your apples and then move into the peaches. Late pruning creates more of a shock to apples than to peaches.

Growers in areas A and B should get oil applications on as soon as possible if powdery mildew is a problem. Where mildew is not a problem, oil can be applied until a fungicide that is not compatible with oil (sulfur, captan, Dikar, or dinitros) is needed.

Thorough oil coverage is most important to control San Jose scale and European red mites. Do not apply oil if freezing temperatures are expected within a day of application. Peaches are more sensitive than apples.

From the dormant to the green-tip stages, 2 gallons of oil per 100 gallons, or 6 gallons of oil per acre is a sufficient dosage. This may be reduced to 1-1/2 gallons at the half-inch-green stage and 1 gallon at the tight-cluster stage on apples. Low-volume applications are as good as dilute, if good coverage is obtained. Insecticides in addition to oil are not needed for European red mite or scale control, but after the green-tip stage, they will help control aphids. It is safer and more efficient to add a systemic phosphate in the half-inch-green or tight-cluster spray for aphids.

Growers in areas C and D who had problems with the seventeen-year periodical cicada in 1956 should plan to get very good oil coverage in order to realize the best European red mite control, since they will need to use sevin to control the cicada.

We like to apply fertilizer three to four weeks before bloom. If you have not finished spreading your fertilizer, do so as soon as possible.

NOTE: The Illinois Commercial Spray Schedules, Supplements A and B, were revised in January, 1973. Tank mixes of insecticides and fungicides are suggested in those schedules, but such combinations are considered illegal unless the insecticide or fungicide labels specify that these products can be mixed and applied together.

The questions raised relate to personal injury, crop injury, or illegal residues on the fruit. Therefore, we feel that the user of orchard pesticides takes all responsibility for any tank-mixing of two or more different pesticides.
Apples are in the pink to early bloom stages in Area A, in the tight cluster stage in Area B, are showing half an inch of green in Area C, and are in the silver tip stage in Area D.

Peaches are in the late-bloom to petal-fall period in Area A; pink to early bloom in Area B; and the popcorn to early pink stages in Area C.

ADD BORON TO PINK SPRAY

Pollen requires boron to germinate and grow properly. To prevent a possible boron shortage during the time apples are blooming, add 1 pound of Solubor per 100 gallons to the pink spray.

PEACH THINNING

Most peach varieties appear to be setting on heavy crops, and will need extensive thinning. This means mechanical thinning for Illinois conditions. Get your Kentuck bumper and pole-thinners ready. If you have not tried Kentsucky bumpers, this would be a good time to do so. Use the Kentucky bumper first; then, touch-up with pole thinners. See pages 30 and 31 of Illinois Circular 1073.

DISEASES

Continued wet weather is enhancing the possibility of severe scab infections. Wet weather causes ascospores to be released from perithecia on leaves from the previous year. This primary infection must be controlled in order to prevent scab later in the year. Cyprex (dodine) and Benlate (benomyl) are the most effective materials against scab. Use Cyprex at 1/2 pound per 100 gallons, or Benlate at 1/4 pound per 100 gallons. Continue spraying with Cyprex or Benlate at these rates until the scab threat subsides as the result of drier weather.

Soggy orchards make spraying difficult. It is much easier to pull a half-full sprayer through the wet spots. A half-full tank of 2X concentration will spray as many trees as a full tank of 1X concentration. Higher concentrations will cover more trees. If you have not tried concentrate spraying, this might be a good time to start.

INSECTS

Most peaches are too far advanced for prebloom sprays. Sevin must be applied at least two days before the first blossom opens. Cool weather does not stop tarnished plant bugs, but it does slow the arrival of stink bugs and curculio into the orchard. Cool weather will also delay the emergence and activity of the codling moth.
Eastern tent caterpillars were very numerous in parts of Areas A and B last year. Any fruit or related trees that are not protected could be quickly defoliated by numerous colonies. Wild cherry is always a good indicator plant to see whether this pest is present.

Climbing cutworms have been reported in a nursery at Farina in Area B. These worms have been known to eat the blossoms on young fruit trees, and are usually not spotted until the early bloom stage (when insecticides cannot be applied). They are active only at night, hiding in the ground litter during the day. Seven bait, spread under the trees, or an organic phosphate insecticide in the pink spray will give control.

Stephen M. Rie
Assistant Professor of Plant Pathology

Ron Meyer
Fruit Entomologist

Daniel B. Meadow
Extension Horticulturist

Malcolm C. Shurtleff
Extension Plant Pathologist
STAGES OF DEVELOPMENT

Apples are in early bloom to late bloom stages in area A; cluster-bud to pink, in area B; tight cluster, in area C; and green tip, in area D. Peaches are in the petal-fall stage in area A; in bloom, in area B; and in late pink, in area C.

PLANTING TREES

You will help get your new trees off to a good start by giving some attention to the roots before planting. Remove broken parts of roots. Shorten any long roots so they will not be bent around in the hole.

After planting, prune the trees severely. If apple trees are branched there is a great temptation to save one or two branches; but they sometimes grow more vigorously than the central leader, thus disrupting the tree-training efforts. We would like to have four or five branches of about equal size and vigor for our lowest branch cluster. It is difficult for new branches to catch up in size with branches that are saved at planting. More severe pruning may be needed after one or two years of growth in order to keep the branches balanced in size.

Tree training is usually easier if you remove all the branches at planting time and top the trunk as we would for an unbranched whip.

DISEASES

Continued wet weather amplifies the scab threat on apples. Continue to spray with Cyprex (dodine) or Benlate (benomyl) at the recommended rates.

Other diseases aided by wet weather conditions are the rust diseases (Quince rust and Cedar-apple rust). Start rust control during the pink-spray period, and continue these efforts through the third cover. Dikar, Polyram, or zineb are suggested. Dikar is recommended on apples primarily where multiple control is needed—for example scab, powdery mildew, rust, and mites in various combinations. Benlate will control scab and powdery mildew, but not the rust diseases.

If conditions should begin to dry, powdery mildew may rapidly become a serious problem on apples. This mildew is also a springtime disease, because young leaves are much more susceptible than mature leaves. Also, cool springtime temperatures of 66° to 72° F. are most favorable for powdery mildew infections. Midsummer temperatures above 80° F. hinder the development of powdery mildew. Wettable sulfur at 6 to 8 pounds per 100 gallons is the ideal fungicide for powdery mildew, but Dikar and Benlate also give excellent control.
You may want to mix materials to get a two- or three-way effect. Most of the recommended fungicides are compatible with each other, such as Cyprex, captan, wettable sulfur, Dikar, and Polyram. Benlate should not be used as a tank mixture with alkaline pesticides such as basic copper sulfate, Bordeaux mixture, or lime sulfur. Concentrate sprays of Benlate and oil do not seem to be completely compatible.

Peaches are at the post-bloom point in southern Illinois. Apply microfine, wettable sulfur at 6 pounds per 100 gallons for control of peach scab and brown rot. Continue sulfur sprays every 14 days up to at least 40 days before harvest. At petal-fall, Guthion 50 W (5/8 pound) or Imidan 50 W (1-1/2 pounds) will control curculio, oriental fruit moth, stinkbugs, and catfacing insects.

Early reports after the April 10 freeze indicate that severe damage occurred in areas A and B. Early apples were hit hard. Peach damage often varies widely. Some growers report less than commercial crops, others feel they will have enough to continue taking care of the fruit. Starking apple trees were hurt in area A because they were more in bloom than the Jonathon and Golden Delicious trees. Early judgments after a freeze are often revised.
No. 4--April 22-28, 1973

Because of the cool weather, the stages of development have not advanced much since last week.

Growers are still trying to assess damages from the freezes last week. In the Jackson-Union county area, some blocks of peaches and apples suffered severe damage. Others appear to have survived. At Chester, both apples and peaches appeared to have only minor loss. Around Centralia, peaches appear to be completely lost and apples severely damaged. Light damage is reported from Pike and Adams counties and here at Urbana. No damage was noted in northern Illinois.

Summer apple varieties and Red Delicious appeared to have suffered the greatest losses, with Rome and Golden Delicious suffering the least. We may have to wait until after the June drop to get an accurate estimate of the damage in some blocks.

FIRE-BLIGHT

Recently some growers asked about the number of degree days necessary for severe fire-blight infection. Below is a summary of this concept that was proposed by Dr. Powell in Illinois Extension Circular 1073, Pest Control and Related Orchard Practices in Commercial Fruit Plantings, issued in February.

After a freeze such as we experienced on April 11, a potentially dangerous inoculum of bacteria begins to build up if the maximum temperatures are above 65° F. Should the maximum daily temperature reach 72° F., this would equal seven degree days (72° F. minus 65° F. equals 7 degree days). Degree days are cumulative. Observations indicate that thirty degree days from the last freeze is a sufficient period for the bacteria to reach a dangerous population level. Individual growers can easily determine whether they face a severe fire-blight threat by computing the number of heating degree days since the last freeze. It seems possible that with the cooler temperatures experienced during the last week, many growers may not have reached a severe inoculum potential as yet. If a period of thirty degree days has occurred, then proceed with the streptomycin sprays listed herein.

On Jonathan and other varieties susceptible to fire blight, streptomycin should be applied in the late-pink-stage spray, and continued every four days as long as the trees bloom. Be sure to include the late bloom spray on one-year-old shoots. Effective control of blossom blight reduces the occurrence of shoot blight later in the year. Remember to use 100 p.p.m. if the temperature is below 65° F., and 50 p.p.m. above that.
PEACH SCAB

The critical period for infection by peach scab fungus is the shuck-split through the second-cover stages. Microfine wettable sulfur (95-percent wettable powder) at 6 pounds per 100 gallons will control peach scab. Continue sulfur sprays every fourteen days up to at least forty days before harvest. Re-apply sulfur within 24 hours after each heavy rain. Applications of benomyl (Benlate, 50% WP) at 1/2 pound per 100 gallons is reported to give good control of peach scab. If you plan on using benomyl to control brown rot, then the addition of two more sprays at shuck-split and shuck-fall should help control scab. Both sulfur and benomyl also give excellent control of powdery mildew and brown rot. Spray thoroughly!

WE ALL NEED TURNER HALL

Illinois Senator Stanley Weaver recently introduced Senate Bill No. 808, which "makes appropriations... for permanent improvements to the Board of Trustees of the University of Illinois for fiscal year 1974." This bill includes the critically needed Turner Hall Addition, which would for the first time in history house the Department of Plant Pathology under one roof. For example, the offices of Dr. Ries and of Dr. Burns and Shurtleff are 1-1/2 miles apart. Proximity would improve our efficiency, thus the quality of our work and our service to you. We are sure you see this need, both for you and for us. Please write to your state legislator expressing your concern about Turner Hall and urging them to pass Senate Bill No. 808 when it comes to the floor.

Growers in areas where freeze damage was high will want to leave insecticides out as long as any blossoms are open in order to provide every chance for fruit set. The greatest danger from insects at this time is from curculius and visible caterpillars. Unless previous experience with curculio indicates that they will be numerous, enough damage to require a quick spray is not likely. Caterpillars can be seen by chewing damage along the midrib or around the blossom clusters.

During and immediately after bloom, red mites can be seen on the small leaves that came out of the bud. Your previous experience and the number of mites present are the important factors to consider in deciding whether a miticide is needed. If more mites than normal are present, you should consider a half to full dosage of a miticide in the first-cover spray. Remember that red mites will disperse onto the new leaves after petal fall, giving the impression of not being as numerous as they actually are.

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Assistant Professor  Fruit Entomologist  Extension  Extension Plant of Plant Pathology  Horticulturist  Pathologist
No. 5--April 29--May 5, 1973

The state of development for apples in areas A and B has been altered by the freeze. The second bloom is now in petal-fall to first-cover. Apples in area C are in the full-bloom to early petal fall period; in area D, cluster-bud to early pink.

The full effects of the freeze damage cannot be assessed until after the June drop and until the frost russet is readily visible. In some Calhoun County orchards, frost rings were seen on Jonathan trees last week. Blossoms in all stages of development showed the ring-unopened blooms, those in bloom, and those in petal fall. It is most unusual to see frost rings so early. Frost russet usually is not visible until the second, third, or fourth cover spray.

In many southern Illinois apple orchards, all of the early bloom was killed. Golden Delicious and Jonathan trees developed a fairly good second bloom. If this second bloom sets, fair crops may be possible. Red Delicious sports had fewer uninjured second blossoms. The late bloom period is just now ending, so it may take a week or two to determine the set.

THINNING EARLY APPLES

In Areas C and D where freeze damage did not occur, early apple varieties should be thinned at petal-fall. (See pages 29 and 30 of Illinois Circular 1073.) If the leaves show damage from frost or from wind dehydration, reduce the concentrations of chemical thinners by 25 percent.

DISEASES

Recent reports from southern Illinois indicate that primary scab infections are developing on apples. The extremely wet weather during the last month plus warm temperatures have encouraged this organism, and at the same time made spraying difficult. If primary scab is present in your orchard and if it is left unchecked, fruit and leaf infections will be severe this year. Therefore, we strongly advocate continued sprays with Cyprex 65W at full strength (1/2 pound per 100 gallons.) Cyprex is suggested because it inactivates spores, and also protects.

REMINDEERS: (1) continue sprays to control rust diseases on apple through at least the third cover! (2) On Jonathans, the prolonged bloom being experienced this year necessitates continued fire-blight sprays every four days for the duration of bloom!

Peach leaf curl is also present year. A spray of Cyprex when the trees were dormant would have offered excellent control. Unfortunately, there is nothing that can be done at present to stop the progress of this disease.
INSECTS

Aphids have not been reported, but growers in area A should watch for developing colonies of rosy aphid. In area D, a systemic phosphate insecticide can still be applied before bloom.

Growers in Area D should review earlier issues of this report, since the factors discussed for early stages may not be mentioned again as growth advances. Insecticides may not be required before bloom if experience indicates that overwintering populations are light and no signs of injury can be found. Although the first of the lesser peach tree borers may be emerging in area A, special borer sprays normally are not started until June. Peach growers should note areas where borer damage is greatest, occasionally cutting into wounds to see the sizes of the larvae present. Mostly large larvae means that damage is being done now and that moth emergence will be early—requiring a borer spray application early in June.

Stephen M. Ries  Ron Meyer  Daniel B. Meadow  Malcolm C. Shurtleff
Assistant Professor  Fruit  Extension  Extension Plant
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DYING TREES

Serious tree loss is showing up in Areas A and B, primarily on young peach trees. Some growers report that up to a third of the trees in some blocks are dying. In most cases the trees started leafing out and then began to wilt and die. Investigation shows dead areas of bark at the ground line and below the ground.

The trees have been standing in soggy wet soil since early last fall. We had a sudden freeze in mid-October last fall, then warm weather in December followed by a sudden cold spell. And the previous year we had a severe freeze in early November and severe cold in January.

Young apple trees also are beginning to die.

THINNING APPLES

Because of the freeze damage in Areas A and B, apple thinning will be a precarious situation. Most Red Delicious and Jonathan trees will not need thinning. The big problem will be on Golden Delicious. The set looks fairly heavy on some trees, but we cannot be certain that the heavy set will stay on the trees. One indication is the number of seeds per fruit. Apples with two or three seeds may fall or they may stay, depending on their competition.

Because of the injury to the leaves, chemical thinners will be more effective this year. Apples with 2 to 4 seeds are more susceptible to chemical thinners than those with more seeds. Thus concentrations of chemical thinners should be reduced at least 25 percent this year on Golden Delicious.

Rome trees in Areas A and B appear to have a heavy set and will need chemical thinning.

SPLITTING OF JONATHAN APPLES

Young Jonathan apples are showing a longitudinal split along the stem where it joins the apple. The split often extends into the apple. This condition has been found in the Quincy area, at Urbana, and around Belleville. Not all apples in a cluster show the split, nor do all clusters contain split apples. We think the split is due to frost damage.
Splits have not been seen in other varieties. Brown areas on the sepals have been found on Golden Delicious in Jackson County. So far the discolored area appears to be confined to the outer surface of the sepals.

DISEASES

Powdery mildew on apples has been reported around Centralia, Illinois. Optimum temperatures for development of this disease (66° to 72° F.) are occurring. Keep an eye on Jonathans (a susceptible variety) for appearance of this disease and follow the recommended control schedule (Circular 1073). Remember that Benlate at 4 ounces per 100 gallons offers excellent control.

Apple scab continues to be a potentially serious problem. Areas A and B should be through the primary infection period. Area C probably has both primary (ascospores) and secondary (conidia) spores present. However, Area D is probably still in the primary infection period. The following table indicates the hours of continued wet foliage required for primary scab infection at different temperatures.

<table>
<thead>
<tr>
<th>Temperature (°F.)</th>
<th>Hours of wet period required for primary infection</th>
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</thead>
<tbody>
<tr>
<td>41-42</td>
<td>30</td>
</tr>
<tr>
<td>43-45</td>
<td>20</td>
</tr>
<tr>
<td>46-50</td>
<td>14</td>
</tr>
<tr>
<td>51-53</td>
<td>12</td>
</tr>
<tr>
<td>54-58</td>
<td>10</td>
</tr>
<tr>
<td>59-76</td>
<td>9</td>
</tr>
</tbody>
</table>

Once primary scab is established, the secondary inoculum (conidia) are produced in 8 to 13 days after initial infection at 50° to 70° F. These conidia require a wet period about three hours shorter than for primary infection (6 hours at 59° to 76° F).

INSECTS

Continued rainy and cool weather will delay and extend codling moth emergence and egg-laying. Unless insect carryover is known to be high, the weather is still more likely to threaten Golden Delicious finish than insects are to cause insect damage. It might be well, therefore, to follow the suggestions for getting good finish on Golden Delicious given on page 14 of Circular 1073.

The period of late bloom and petal fall is a good time to look for European red mites on the first leaves out of the bud and for leaf roller injury along the midrib on the under side of leaves in tree centers. The amount of injury found at this time will indicate the degree of watchfulness required later in the season.

We appreciate being advised of any unusual problems or occurrences. Sometimes problems are detected early when several growers report similar problems although the problem may not be severe at any one location.
INSECTS

During a very wet spring, insects are generally suppressed. That is true this year according to the reports received thus far. Frequent applications to control diseases usually include insecticides that add to the suppressing effect of the weather. With careful and continued observations for insect injury, insecticide dosages may be reduced where frequent fungicide applications are being made.

Red mite populations are delayed but usually not stopped by wet weather. Growers in area A should begin to watch mite development closely in selected spots where they usually occur first.

STAGE OF DEVELOPMENT

In area D, apples are in early bloom. In area C they are in the petal-fall to first-cover stages; in areas A and B, in the cover stages. Strawberries are starting to ripen in area A.

DEFRUITING YOUNG APPLE TREES

No fruit should be allowed on young apple trees until the tree is large enough to bear sufficient fruit to make spraying profitable. Fruit production reduces growth. The New York Experiment Station says every 2-pound unit of fruit on a young tree reduces total shoot growth by 3 feet.

A lot of fruit on young trees can be removed by spraying them with 2 pounds of carbaryl (Sevin) per 100 gallons of water shortly after petal-fall. The remaining fruit should be removed by hand.

ADDITIONAL NITROGEN ON PEACH TREES?

In some orchards in areas A and B, peach trees have weak foliage that is showing symptoms of nitrogen deficiency, even a normal application of nitrogen was made earlier.

Because of the heavy rainfall, some of the applied nitrogen may have been lost through leaching. But the major cause of the weak foliage is probably the inability of the roots to function properly in the excessively wet soil. When the soil dries to more of a normal moisture content, the roots can resume their activity and the appearance of the foliage should improve rapidly. In some cases, an additional light application of nitrogen may be helpful for trees that are car-
rying a good crop. Trees with no crop or a light crop probably should not have additional nitrogen. Too much nitrogen encourages late growth into the fall, making the trees more susceptible to winter injury.

**BACTERIAL SPOT OR NITROGEN DEFICIENCY?**

A wet season fosters infections, of bacterial spot disease; also, nitrogen deficiency symptoms. Spots and holes in the leaves can be caused both by nitrogen deficiency and by bacterial spot. Sometimes it is difficult to tell them apart. Bacterial-spot lesions are more likely to occur on the tip end of the leaves. Nitrogen-deficiency symptoms generally occur along the veins. The holes from bacterial spot are usually smaller than those from nitrogen deficiency. Varieties differ greatly in their susceptibility to bacterial spot, but they are similar in their susceptibility to nitrogen deficiency. Rio-Oso-Gem is very susceptible to bacterial spot; Redhaven and Redskin, less so. If Rio-Oso-Gem, Redhaven, and Redskin show the same amount of leaf symptoms, the problem is likely to be mainly a nitrogen deficiency rather than a bacterial-spot infection.

**APPLE SCAB**

The wet weather and soggy orchards continue to provide optimum conditions for scab development. Most fruit growers have been successful in controlling a possible epiphytotic disease situation, and are to be congratulated. Some orchards in the Urbana area are showing how serious this disease can be if left unchecked. Infections on the pedicel (fruit stem) are common, and will cause a severe fruit drop.

**FIREBLIGHT**

Although no fireblight has yet been reported, controlling this is important. Early symptoms include blighted blossoms and terminal twigs. It is extremely difficult to make recommendations about streptomycin sprays on Jonathan. All but areas C and D are past the bloom stage. The recent cool weather slows the development of the fireblight organism, but wet weather aids the development of this disease. If a spray suggestion is to be made, it is that blight will continue to be a problem until dry weather should prevail.
No. 8—May 20-26, 1973

Apples are at the stage for chemical thinning in Area C, and are in the bloom to petal-fall stages in Area D. Golden Delicious and Rome are the varieties most likely to need thinning. Most Jonathan and Red Delicious trees probably will thin themselves. Some spur-type Red Delicious trees have a heavy set and should be thinned.

Chemical thinning suggestions are given on pages 29 and 30 of Circular 1073. Some growers have tried a combination of NAA and Sevin applied at the normal time for application of NAA. On hard to thin Golden Delicious trees, they like the results from using the combination better than those from using either material applied alone. In these applications, Tween 20 was not used.

We have tried Sevin with and without Tween 20 here at Urbana. We did not find any increase in thinning from adding Tween 20. This year, we will try a combination of NAA, Tween 20, and Sevin.

OSHA published reentry regulations on May 1, to take effect June 18. These regulations are quite different from those prepared by the committee assigned to draw up proposed regulations.

The number of days between application and reentry in apple orchards for the pesticides most likely to be used in Illinois during the remainder of the spraying season are as follows:

<table>
<thead>
<tr>
<th>Pesticide</th>
<th>Days Between Application and Reentry</th>
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<tbody>
<tr>
<td>Guthion</td>
<td>5</td>
</tr>
<tr>
<td>Trithion</td>
<td>5</td>
</tr>
<tr>
<td>Parathion</td>
<td>5</td>
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<td>TEPP</td>
<td>3</td>
</tr>
<tr>
<td>Imidan</td>
<td>2</td>
</tr>
<tr>
<td>Malathion</td>
<td>2</td>
</tr>
<tr>
<td>Zolone</td>
<td>5</td>
</tr>
</tbody>
</table>

**DISEASES**

There is little new to report on disease development. We have received no reports of blossom or shoot blight. The apparent absence of fire blight does not suggest any reduction in streptomycin sprays. These sprays should be continued on Jonathans and other susceptible varieties at four-day intervals throughout the blossoming period (including late bloom), and at seven-day intervals during the post-blossoming period (preferably night sprays) into July.

Apple powdery mildew has been reported in Areas A and B. We are beginning to see some mildew in Urbana. The recent dry weather has encouraged the development of this disease. Remember that mildew can spread during the summer season. Benlate, sulfur, and Dikar are all effective in controlling this disease.
Area D is beginning to report visible primary apple scab lesions. We recommend that you consult past issues of this report concerning the potential seriousness of this disease, and how it may be controlled. Allowing primary infections to occur is extremely hazardous because the resulting secondary infections are very difficult to control!

**INSECTS**

Insect control continues to look good. Aphids are favored by cool weather mites are just delayed. The appearance of red mite populations must be compared to previous experience. If red mites have required control each year in a particular block and you have handled the block the same, you should apply a half dosage of miticide as soon as you can consistently find mites from tree to tree. Fundal, Galecron, and Morocide will kill equal numbers of red mites and predator mites. Most other miticides in use will not kill the predator mites. Reducing red mite populations when they are at a low level will not delay the appearance of predator mites, since they are able to increase their ratio in relation to plant-feeding mites at very low levels. The second half dosage of miticide should be delayed until a rapid increase of red mites is again observed.

Some peach trees have so few fruit that they will not be sprayed. If Oriental fruit moth has been under good control, it usually takes the first two generations to build up enough numbers to be noticed. In Area A, the first brood of larvae should be starting to mature and change to pupae. Moths will emerge and begin laying eggs about June 1. When spray schedules are spread out or stopped, more careful observation is required. Pheromone traps provide a good means to help watch Oriental fruit months.

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Stephan H. Ries

Fruit Extension
Insect control continues to look good from all reports. Codling moth adults appeared in traps at Urbana by May 20. The hatch could be under way in Area A, although the cool weather earlier would greatly delay development.

Peach growers should have determined by now how much effort will be required to control the lesser peach tree borers. If fruit will be harvested, you must apply sprays at times and using dosages that fit the harvest restrictions printed on the label of insecticides to be used. In general, two applications will give good control. Three would be better; and four, best. Yet, two thorough coverage applications are better than four sloppy ones. Regular air-blown sprays do not give good enough coverage. Hand-gun sprays must thoroughly soak all gumming and damaged or rough bark, or they are no better. Increased dosages of insecticides may be used in two applications if no fruit is present, or in the after-harvest application for improved control if only two applications are made.

Brood 13 of the 17-year cicada is expected in Area D and the eastern half of Area C. Growers in these areas should seek records or recollections of the experiences in 1956. In areas where swarms will occur, emergence mounds 1 to 6 inches high, quite similar to crayfish mud mounds, will begin to appear in the next two weeks under infested trees. Egg-laying does not begin until a week after emergence. Controls are not needed until about third-cover time, when the thinning effect of Sevin is past.

The greatest difficulty is in controlling egg-laying females that drift with the wind from wooded areas into the orchard. These areas will need to be sprayed as often as every four days. Red mites should be kept under strict control where Sevin will be used.

DISEASES

The drier weather of the past two weeks has slowed down the apply scab fungus. Remember that it only takes 6 hours of wet weather at 59°F to 76°F to cause secondary infections. Rain in Urbana on Tuesday caused spore dissemination and provided optimum weather conditions for infection. Scab will continue to be a problem whenever periods of wet weather occur.

No fireblight has been reported in Illinois yet this year. Continue to use adequate protective measures (streptomycin) into July, or until temperatures average 85°F.
There have been scattered reports of apple powdery mildew occurring in Areas B and C. That organism will continue to threaten susceptible varieties into the summer season.

APPLES

Apples in Area D are in petal fall to first cover. They are in various cover stages in Areas A, B, and C.

FIELD DAY AT DIX

Plan now to attend the Summer Orchard Field Day of the Illinois State Horticulture Society Thursday, June 7 at Myers Orchard at Dix. Time 9 a.m. to 4 p.m.

STABILIZING YOUNG TREES

Young trees that are loose in the ground frequently can be stabilized by mounding a shovelfull of small gravel or crushed stone around the trunk. The gravel or crushed stone must be fairly small (a quarter to a half an inch in diameter), and must not contain any sand or fines. The material must remain loose in order to be effective. Sand and fines cause it to pack.

The theory of action is that if the tree sways in the wind and thus opens a hole around the trunk, the loose material will fall into the hole, fill it, and stabilize the tree. Gravel or crushed stone also acts as a partial protectant against field mice.

SUMMER PRUNING OF YOUNG TREES

You can reduce the amount of dormant pruning and encourage and direct the growth and development of young apple trees by summer pruning. Where a branch was tipped or headed-back in dormant pruning, frequently two or three new shoots will grow and will compete with each other to become the new leader. While the new shoots are young and tender is a good time to select the new leader and to remove its competition.

Water sprouts are also starting to grow in young trees. Removing them will direct growth into the selected scaffold branches.

Stephen M. Ries
Assistant Professor of Plant Pathology

Ron Meyer
Fruit Entomologist

Daniel B. Meadow
Extension Horticulturist

Malcolm C. Shuttteff
Extension Plant Pathologist
PEACHES ARE LOOSE

Peaches are now loose in Area A and are ready for thinning by shakers, Kentucky bumpers, and poles. Most peach trees were overthinned by the spring freeze, but some varieties in certain locations may need some thinning.

In the Salem-Centralia area, Comanche continues to look good as a cold hardy variety. Some Comanche trees in that area will require considerable thinning.

ALAR ON PEACHES

The growth regulator Alar is supposed to make peaches ripen more uniformly, and three to seven days earlier. Some growers have been pleased with the results of using Alar on peaches. Others were either unhappy with the results or did not see much benefit.

Alar advances the ripening time of late varieties, such as Redskin and Rio-Oro-Gem, more than that of earlier varieties like Redhaven. By treating part of the planting of a variety, the length of harvest of that variety can be extended.

Alar is most effective when applied just before pit-hardening time (when the peaches are loose and ready for pole-thinning). Use 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. A concentrated spray may cause leaf injury.

Do not mix Alar with other spray materials. Apply Alar so that it will be on the leaves for at least 12 hours before rain. Treat healthy, vigorous trees only. Damaged or weak trees do not respond to an Alar treatment.

JERK WATERSPROUTS

Most watersprouts in apple trees are still tender and easy to remove by jerking. Doing that now is much faster than cutting them out next winter, and it will help keep the trees open for spraying and harvesting.

DISEASES

Apple scab is being reported throughout Illinois. On unsprayed trees in Areas C and D, this disease is causing complete defoliation. Reports from southern Illinois indicate that infections there have been localized and scattered.
Cedar-apple rust is appearing on apple fruit and on leaves in western Illinois. This disease has the same alternate host as the quince rust fungus, which is the red cedar (Juniperus sp.). Recent rains could cause these diseases to be severe this year. The dithiocarbamate fungicides (ferbam, zineb, polyram, maneb, Dikar, and so on) will control both types of the rust diseases. Thorough coverage is important.

Sprays to control the rust diseases generally may be terminated after the third-cover spray. This year, with the prolonged cool wet weather, may be the exception. A good rule to follow this year is to observe some nearby cedar trees soon after a rain. If these trees are actively producing spores from the "cedar galls," continue to apply control sprays. In quince rust, the gall is a spindle-shaped enlargement on the stem--in contrast to the definite gall of cedar rust. When these galls are active, gelatinous spore horns are exuded from the center of the gall.

Fireblight is starting to show up in Areas A, B, and C. Continue streptomycin sprays at seven-day intervals for at least another month. Night sprays are preferable.

SUMMER ORCHARD FIELD DAY

We will see you Thursday, June 7, at Myers Orchard near Kell for the Summer Orchard Field Day of the Illinois State Horticultural Society. Access to the orchard is from Illinois Highway 37. From the north, leave Interstate 57 at Illinois 161 south of Salem, go east to Illinois 37, then go south to the sign pointing to the orchard. The orchard is located west of Illinois 37.

From the south, leave Interstate 57 at Dix and go north on Illinois 37 to the orchard sign.

Illinois 161 is closed for repairs from Interstate 57 west to Centralia, but is open from Interstate 57 east to Illinois 37.
Cedar-apple rust is now being observed in various regions of the state. In the Quincy area, this rust is apparent in susceptible varieties (Jonathan, Ben Davis, and Rome Beauty). The pale, yellow-orange lesions are seen on both the leaves and the fruit. In the Chester area, cedar-apple rust is present on Golden Delicious leaves. No quince rust has been reported thus far this year.

Scattered pockets of fire-blight are showing up. They are occurring at Anna, Quincy, and Urbana. None has been seen in the Chester area. Continue streptomycin sprays at seven-day intervals (preferably at night) through July 15.

Apple scab is severe in the northern portion of the state. In Urbana, some blocks are showing defoliation and fruit drop because of this disease.

Blister spot is currently being seen in southern Illinois. This disease is caused by the bacterium *Pseudomonas syringae papulans*. Numerous (100 or more), small, slightly raised pimples occur at the lenticels. These spots do not increase in size and are superficial, but may reduce fruit quality. This organism thrives in continuously wet weather, such as that we have had this year. Generally this disease does not cause enough damage to warrant special sprays; therefore, no control measures are known. A normal spray program should help keep this disease at a minimum.

CARE OF YOUNG APPLE TREES

The wet spring reduced the amount of time growers were able to devote to the care and training of young trees. Now is a good time to insert branch spreaders where needed in spur-type Red Delicious trees. The branches are growing rapidly and are easily bent. Also, we are now approaching the start of the bud-differentiation season. Spreading the branches will encourage the initiation of fruit buds for next year's crop.

Light summer pruning to break up crow's feet, to remove water sprouts, and to cause branching by nipping-out the tips will help direct growth.

INSECTS

Rosy apple aphids are still present in some orchards. Guthion and Imidan provide some suppression. But if colonies are expanding, a systemic phosphate can be used.
Peak emergence of codling moth occurred May 23 at Quincy. First-brood Oriental fruit moth larvae have completed their growth at Urbana. Eggs will be hatching in Area A. San Jose scale crawlers will begin to appear in Area A where populations are present.

The rain will delay the buildup of mite populations, but keep watch on red mite development where it usually appears first. The first borer spray should be applied to peaches. There is some suspicion that resistance may be developing to Thiodan. If you want to make a comparison, use a tank of Guthion or Imidan on part of the trees on each of the borer applications.

TANK MIXES

The U.S. Environmental Protection Agency has recently taken a stand on tank mixes of pesticides (mixing two or more pesticides in the spray tank at time of application). They state that tank mixes and serial application (repeated treatments) fall into one of three categories:

1. Those tank mixes that have instructions provided for such use on EPA-registered product labels. A common example would be Alfatox (a mixture of diazinon and methoxychlor), used for alfalfa weevil control. Other examples would be various commercially prepared fruit and vegetable sprays and dusts containing two or more pesticides. These uses can be continued and the U.S. EPA accepts responsibility for them.

2. Tank mixes that may be covered by a state registration. The State of Illinois registers only those pesticide labels having U.S. EPA approval; therefore, this category would NOT apply in Illinois.

3. Various tank mixes and serial applications that are recommended by a state or are commonly used in that state for agricultural purposes. These uses can be continued if:

   a. The products in the mix are applied at a dosage rate not to exceed the label instructions for use of any product in the mix used singly for the same set of insects on the same crop; AND

   b. if the label on one or more of the products does not explicitly instruct against such mixtures.

The burden of responsibility for the continued use of these tank mixes in category three is that of the user, not the U.S. EPA. He applies them at his own risk with respect to any effects on crops and application equipment, applicator safety, environmental effects, and tolerance intervals before harvest.

The U.S. EPA is unofficially sanctioning their use, but is also absolving itself of responsibility. The EPA also states that in the future, it may take appropriate action to rule the use of specific tank mixes or serial applications to be inconsistent with label instructions on a case-by-case basis.
No. 12--June 17-23, 1973

DISEASES

There isn't much to report on diseases this week. The major disease problem continues to be apple scab. This disease should be on the decline, however, as dry weather becomes more prevalent. The dry weather will not allow this fungus to spread or to initiate new lesions.

Reports of powdery mildew on apples are scattered. This fungus is favored by temperatures of 60° to 72°F, and hindered when temperatures go above 80°F. Therefore, recent weather should slow the development of powdery mildew.

Continue sprays to control fireblight. If a severe problem with this disease develops this year, the symptoms will become apparent during the next two weeks.

The summer diseases (black rot, bot rot, bitter rot, flyspeck, and the like) have not been reported in Illinois this year.

SYMPTOMS AND SIGNS OF ORGANOPHOSPHATE CAUSED ILLNESS

One requirement of the new OSHA regulations on organophosphate insecticides is that workers and foremen be informed of the symptoms and signs of organophosphate that will cause illness. The symptoms include: headache, giddiness, nervousness, blurred vision, weakness, nausea, cramps, diarrhea, and discomfort in the chest. The signs include: sweating, tears, fluid in the lungs, the lips and fingernails turning blue, excess saliva production, excessive respiratory tract secretion, vomiting, swelling of the eyelids, contraction of the pupil of the eye, and uncontrollable muscle twitches.

In occupational cases, illness is frequently delayed several hours. The worker may first become ill at home after supper.

APPROVED RESPIRATORS

See page 11 of Illinois Circular 1073 Pest Control and Related Orchard Practices in Commercial Fruit Plantings for a list of approved respirators and approved replacement filter cartridges.

INSECTS AND MITES

Insect populations in apple and peach orchards are still light. Mites, in contrast, are increasing rapidly in some apple orchards within all areas of the state. One grower in Area B found a heavy buildup of mites in a block that did not have an oil spray. Mites had not built up in blocks that did have an oil spray. A grower in Area D is finding a mite buildup even though an oil spray was applied.
PEACH CROP PROSPECTS

Georgia expects a slightly smaller crop than last year, but South Carolina expects a slightly larger one. California prospects are about the same as in 1972. Michigan suffered freeze damage in May. Estimates now are for about 50 percent of a freestone crop. New Jersey prospects are fairly good. Redhaven trees are set heavily. Colorado expects a normal crop. The prospects for peach crops in Missouri and Indiana are similar to those for Illinois.

Stephen M. Ris  Ron Meyer  Daniel B. Meadow  Malcolm C. Shurtleff
Assistant Professor  Fruit  Extension  Extension Plant
of Plant Pathology  Entomologist  Horticulturist  Pathologist
DISEASES

Apple scab continues as our most prevalent disease problem throughout Illinois this year. This disease is epiphytotic in the Urbana area with unsprayed susceptible varieties showing 50 percent fruit infections. The old adage is true! To stop apple scab the primary infection must be controlled.

There is little to report on other diseases occurring in the state. Scattered reports of quince rust are coming in. Cedar-apple rust is present but not common. Fire-blight has not reached serious proportions, and the summer diseases are not yet present.

Some fire-blight, cedar-apple rust, and black rot are present in our orchards in Urbana. None of these diseases are providing a serious threat at this time.

OSHA REENTRY STANDARDS SUSPENDED

The temporary reentry standards after organophosphate application established by OSHA to take effect June 18 have been suspended. OSHA states that it expects to issue new temporary standards about June 25.

PEACHES

A report from the bootheel area of Missouri indicates Cardinals and Jerseylands are now being harvested. Growers report a very high percentage of split pits.

Chris Doll reports a heavy peach drop on his home planting. Upon investigation he found that the seed and pit were rotten, probably damaged by the spring frost.

ALAR ON APPLES

Where Alar is to be used on Jonathan and Red Delicious in Areas A and B, application should be made between June 22 and July 5.

Use 1,000 p.p.m. (1 pound per 100 gallons) for dilute spraying. Thoroughly wet the foliage and apply when there will be at least 12 hours between application and rainfall.

DO NOT apply Alar on Jonathans or Red Delicious to be harvested for the early market. Alar delays maturity about 5 days. Use on blocks to be harvested during the latter part of the picking season. Alar is useful for lengthening the harvest season of a specific variety.
Alar also increases color development (partly because harvest is delayed), increases firmness and storage life, acts as a stop-drop material, and reduces the size of the fruit slightly.

Use Alar on healthy trees with normal vigor. It is not effective on weak trees.

**ETHREL IN 1973**

Amchem has still not received label clearance for Ethrel on apples. The experimental label used in 1972 will be used again in 1973. As yet we don't know how much Ethrel will be available this year in Illinois, but it will probably be about the same as last year.

**INSECTS**

Remember to look at the fruit calendar for the stages of the various insect pests. No unusual or problem pests have been reported. A rather high emergence of lesser peach tree borer moths was observed at Belleville. The first borer spray should be on in Areas A and B.

Heavy rains have further delayed the appearance of mite populations, but close observation should continue about 5 days after heavy rains occur.

We have not discussed insect traps as we feel that the second half of the season is the most important time to use them since we must apply sprays regularly during the first half of the season. Pheromone traps are available and easily hung, require little tending, and will give an accurate indication of the population level of the insects for which traps are used. Check with your orchard supply source for traps. Traps, pheromone caps for codling moth, Oriental fruit moth, and red-banded leaf roller, and bait for apple maggot is made by Zoecon Corporation, Pherocon Supply Service, 975 California Avenue, Palo Alto, California 94304. Sectar I traps are made by New Business Venture Division, 3M Company, 3M Center, St. Paul, Minnesota 55101. 3M Company also has pheromone caps and bait available. Both companies supply pictures for identification and instructions for use of their traps. The Zoecon trap is larger and must be assembled by a few simple steps. The Sectar I trap is simply unfolded. The larger trap appears to be slightly easier for insects to enter and so catches a few more insects. Both are highly effective. The pheromone cap looks like a rubber eraser for a pencil and has the attractant material for the male moth absorbed in the rubber. Pheromone caps should be stored in a tightly closed, labeled bottle and kept refrigerated. The cap is effective in a trap for 6 to 8 weeks.

New moth broods will begin emerging this week in Area A and continue for several weeks. After the first males are caught, it takes a week for mating and egg-laying to occur before new larvae will appear. Obviously the more closely the traps are observed the more exactly the appearance of moths will be known. One pheromone trap is enough to show whether any males are present in a 4 to 5-acre area. Bait traps for apple maggot cover a similar area, but the bait attracts both male and female flies.

If you are not sure about identification, carefully remove the trapped insect with a small amount of sticky material, and using the same sticky material glue the insect to a card. When insects are left in the traps, they are soon covered and become difficult to identify.
LAST WEEKLY REPORT

This is the last WEEKLY Spray Service Report for this season. During July and August, the reports will be sent every two weeks.

DISEASES

The peach varieties that will mature in late July or early August should not require any more sulfur sprays to control peach scab. Continue sprays of captan, sulfur, or Benlate for brown rot control as needed. Remember that Benlate at 4 ounces per 100 gallons used as preharvest sprays is extremely effective in controlling post-harvest brown rot.

On apples where bot rot (Botryosphaeria) has been a problem and might develop, growers should switch to Phaltan in succeeding cover sprays. Phaltan will not damage the fruit at this time and will control scab and summer diseases, in addition to being very effective against bot rot.

Fire blight continues to be a threat. Present shoot infections can be traced to winter cankers. At Urbana, shoot infections are near the original canker, which is generally in the center of the tree. Ideally, these cankers should have been removed two to three weeks ago when they were first evident. It is probably not too late to remove the winter cankers. In Area D, growers should benefit from that advice yet this year. Continued streptomycin sprays into mid-July are recommended this year.

The rust diseases on apple (cedar apple and quince) should not be a problem from now on. Continue protection for powdery mildew, but the spray intervals may now be safely extended to fourteen days. Fruit infection should not be prevalent where leaf infections have been controlled.

Continued wetting periods result in a prolonged apple scab threat. Therefore, continue scab-control sprays to prevent fruit infections.

ALAR IN AREAS C AND D

Where Alar is to be used on Jonathan and Red Delicious in Area C and on McIntosh in Area D, it should be applied between July 1 and July 15. On McIntosh, Alar is the most effective stop-drop material available. See last week's report (No. 13) for information on concentrations and application.
LEAF ANALYSIS

The ideal time for taking leaf samples to determine the nutritional status of fruit trees is from July 1 to August 15. Leaf analysis is an effective tool in managing the nutritional status; but like any testing program, the samples must be carefully taken and processed if they are to adequately represent the condition of the trees.

Leaf-sampling kits may be obtained from the Pomology Division, Horticulture Field Lab, University of Illinois at Urbana-Champaign, Urbana 61801. Request one kit for each leaf sample you wish to take. The kit contains instructions and supplies for taking, drying, and mailing the samples. A sample should be of one variety only and taken from trees in one block that are of similar vigor, appearance, and crop load.

APPLE AND PEACH HARVEST STARTS

Lodi apples and early peaches (Cardinal, Earliglo, and Garnet Beauty) are now being harvested in Area A.

INSECTS

Cool, wet weather usually delays the emergence of first-brood codling moths. At the Plant Pathology orchard, the codling moth trap had twenty-four new moths on June 26. They must be very late first-brood moths.

Rosy apple aphids are beginning to migrate to alternate hosts in Areas A and B. San Jose scale crawlers were observed south of Carbondale. All stages were present. If they were present last year, it would be well to check for them now on new growth in areas that were known to be infested. Diazinon and parathion give excellent control with good spray coverage.

Second-brood curculio and codling moth, and third brood/red-banded leaf roller and Orient fruit moths are active in Area A. Mite activity will begin to appear now, and should be closely watched in spots where they appear first. Populations above 100 per leaf were found in Area A.

Stephen M. Ries  Ron Meyer  Daniel B. Meador  Malcolm C. Shurcliff
Assistant Professor of Plant Pathology  Fruit Entomologist  Extension Horticulturist  Extension Plant Pathologist
No. 15--July 15-28, 1973

There is little new to report on disease development. The fire blight threat is now subsiding. At Urbana, 50 percent of the new-shoot terminal buds have followed. Therefore unless weather conditions change, we will apply our last streptomycin spray this week.

The recent hot and dry weather has arrested the spread and development of apple scab. We suggest for future sprays that captan be replaced by phaltan. Phaltan is the fifth spray and succeeding cover sprays will control bot rot, scab, and the summer diseases and will not damage fruit.

INSECTS AND MITES

Mites are the main problem now in both apples and peaches. Peaches are a problem because Kelthane, Omite, and Ovex are the only materials cleared. The harvest restriction for Kelthane and Omite is 14 days. We suggest using miticides now to prevent a buildup of mites on peaches. As peaches start to ripen, we cannot do much about mites.

Other insect activity is light. Growers do report that they are still catching codling moths in their traps.

I.A.I. APPLE GUESSTIMATE

The I.A.I. 1973 Apple Crop Guesstimate is as follows, expressed in 1,000 units of 42-pound equivalents. The USDA estimates for the 1971 and 1972 crops also are given.

<table>
<thead>
<tr>
<th>State</th>
<th>1971, USDA</th>
<th>1972, USDA</th>
<th>1973 Guesstimate</th>
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AMENDED OSHA REGULATIONS ON FIELD REENTRY AFTER CERTAIN PESTICIDE APPLICATION

On June 29, OSHA published amended regulations to take effect July 13. Several charges were made that should make compliance easier. Diazinon, Cygon, Ethion, Imidan, malathion, and Zolone were removed from the list of chemicals covered by the regulation.

Warnings to employees may be given in one or more of the following ways:

1. Placing warning signs at the entrance to the treated area.
2. Giving an oral warning.
3. Posting warning notices on bulletin boards at points where employees usually assemble for instructions.

If oral warnings are used, written records of the oral warnings must be made and kept for one year. Posted warnings also must be kept for one year.

Twenty-four hours after the application of one or more of the chemicals affected by the regulation, workers may enter the area for work that does not require substantial contact with the foliage (mowing, irrigation, and so on) WITHOUT protective clothing or respirators.

Protective clothing and respirators are required for entry (except merely passing through the area) within 24 hours after application of those chemicals.

The affected chemicals and the reentry safety intervals for unrestricted foliage contact after chemical application is given below in days.

<table>
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<tr>
<th>Chemical</th>
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<th>Peaches</th>
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<tr>
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<tr>
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<td>EPN</td>
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<td>Methyl parathion</td>
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<td>Meta-Systox R.</td>
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<td>Parathion</td>
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<td>Phosphamidion</td>
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</table>

1973 QUALITY APPLE CLUB APPLICATIONS

Attached is a form for the 1973 Quality Apple Club application. We are designing a new system of scoring orchards. We hope this new system will give a more accurate estimate of the quality of the crop.

One thousand apples in each orchard will be graded into the following categories according to defects: fancy, number 1, utility, cider stock, and discards. Color will not be considered in the grade because the judging will take place before the apples have had time to develop their full color. Each orchard also will be scored on fruit size, uniformity of crop, fruit finish, pruning, orchard sanitation, and uniformity of the trees.
The scores from the individual apple grading and the orchard grading will be combined to obtain the final score. The old standard of 95 for membership in the club will be discarded because of the new grading system, and new standards will be established.

In the past we have taken too much off for some defects, and not enough for others. We hope the new system will be more equitable. We are still working on the scoring of the new system. We probably will not be able to finalize the point system until after the orchards are judged.

This has been a horrible year for disease control and fruit set. However, many of you growers have done an excellent job. And we encourage you to enter the competition.

Stephen M. Ries  Ron Meyer  Daniel B. Meader  Malcolm C. Shurtleff
Assistant Professor  Fruit Entomologist  Extension Horticulturist  Extension Plant Pathologist
Application for the
1973 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. Inspections will
start about August 27 in the southern area and conclude about September 15 in the
northern area.

Mail this application to: D. B. Meador
104 Hort Field Lab
University of Illinois
Urbana, IL 61801
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 confuse 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 p.p.m. for fall varieties (Jonathan, Delicious, Golden Delicious), and 20 p.p.m. 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 p.p.m. on Golden Delicious. Use 10 to 15 p.p.m. on Jonathan and Red Delicious, and 20 p.p.m. on Winesap and Rome.

Some growers have had good results with a combination spray of NAA at 10 p.p.m. plus 2,4,5-TP at 10 p.p.m.

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.

We suggest delaying the application of stop-drop sprays as long as possible. Then start with two applications of NAA used 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 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 APPLES

Ethrel has received full label clearance from the EPA for use on apples. The clearance was granted on July 26.

Growers' experiences last year showed that the effectiveness of Ethrel is related to temperatures. If several hot days and nights followed a spraying with
Ethrel, this greatly reduced its action in both color development and ripening. Under these conditions, Ethrel was not worth the cost.

When cooler weather followed an application of Ethrel, Jonathan and spur-type Red Delicious apples colored and matured nicely. Ethrel matured Starking, but did not add much color; so we had some poorly colored, mature Starking. We question the use of Ethrel on Golden Delicious. Last year at Urbana, it caused blotchy ripening.

Ethrel should be applied 10 to 14 days before the desired harvest date for the treated trees. Do not treat more trees than can be picked during a two- or three-day harvest period. Treated apples may get overripe or may fall before you can get them picked.

Ethrel loosens the apples, therefore NAA or 2,4,5-TP (or both) must be applied with Ethrel. Amchem also suggests using Tween-20 surfactant with Ethrel.

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.

Used properly with intelligent programming, Ethrel can be a valuable material for apple growers. Improper use or poor programming could have disastrous results. As with any new growth-regulating chemical, this one should be used with caution on small test areas until you learn more about its effects.

FRUIT DISEASES

Several samples of fire blight damage were sent in from Area D this past week, indicating the presence of this disease. Abundant rainfall is the cause. The fire-blight threat is subsiding in other areas of the state. Terminal bud formation stops the spread of this disease.

Heavy rainfall in Areas C and D will encourage the development of the summer diseases. Bitter rot, sooty blotch, flyspeck, and Botryosphaeria (Bot rot) could cause damage. Folpet (Phaltan) is suggested as the best fungicide to use on apples for the remainder of the season, where disease potential is the greatest. Otherwise, fungicides such as captan, zineb, and polyram are adequate.

Always read fungicide labels carefully. Be aware of the harvest restrictions relating to all pesticides. If you have questions, check with your county Cooperative Extension Service office.

INSECTS

Codling moths and Oriental fruit moths have been reported from several locations. The third-brood codling moths could start to come out next week in Area A; brood appeared last week in Area D. The fourth brood of Oriental fruit moth are starting to hatch now in Area A. Severe tip injury was reported on unsprayed trees in Area A. There is no particular danger to bearing trees with no fruit, but they will supply strong pressure next year. There is also some danger that this brood will cause some damage in nearby apples. Growers should always be wary of the codling moth late in the season when light spray schedules have been applied.
Area D growers should keep a close watch on apple maggot for several weeks yet.

Peach growers should remember to get the final borer spray applied as planned. Weeds around the base of the trunks and heavy growth in the tops will make coverage more difficult.

Remember to let us know if you want your orchard entered in the Quality Apple Club. We will start the tour on August 27.

COURT STAYS LABOR DEPARTMENT'S EMERGENCY REENTRY STANDARDS ON PESTICIDE EXPOSURE

Officials of the U.S. Department of Labor report that on July 10, the Fifth Circuit U.S. Court of Appeals in New Orleans issued a stay of the effective date of temporary emergency reentry standards on exposure to pesticides. The standards were prescribed by the Labor Department's Occupational Safety and Health Administration, and were to take effect July 13. The circuit court's stay delays the effective date of the standards, pending a further order of the court. Accordingly, agricultural employers are not required to implement those standards until further court action, according to officials of the U.S. Department of Agriculture.

The standards deal mainly with the reentry of farm workers into areas that have been treated with organophosphorous pesticides, such as methyl parathion. They are printed in the Federal Register of June 29, 1973, beginning at page 17,214.

Stephan M. Ries    Ron Meyer    Daniel B. Meador    Malcolm C. Shortleff
Assistant Professor    Fruit Extension    Extension Plant
of Plant Pathology    Entomologist    Horticulturist    Pathologist
This will be the last regular Spray Service Report for 1973. We wish to thank the many growers and specialists who have contributed to these reports each week. Special Spray Service Reports will be issued occasionally as the need arises.

**DISEASES**

Diseases are generally under control. On apples the fungicide program as listed on the Illinois Commercial Spray Schedule (Supplement A to Circular 1073) is suggested. Except in special cases, orchard pest programs will be close to terminating for the season.

Leaf-yellowing and defoliation of Golden Delicious is prevalent in Area C. This doesn't appear to be a serious matter, but it is disturbing. Other varieties do not show this condition. All Golden Delicious, regardless of spray schedule, are similarly affected. Air pollution during air-inversion conditions is thought to be responsible for this injury. Golden Delicious appears to be most susceptible to such damage. Inversion layers occur when a warm layer of air forms at 3,000 to 5,000 feet. This warm-air layer inhibits the normal circulation of the atmosphere, and air-pollutants accumulate to a level toxic to certain plants.

**HARVESTING APPLES FOR STORAGE**

The light crop of Red Delicious probably will move briskly to market with very few going into storage. The moderate crop of Jonathan also probably will mostly move directly into sales channels. Thus most of the storage apples this year probably will be Golden Delicious.

We have a fairly good crop of Golden Delicious throughout Illinois. So far they appear to have a good finish. If we harvest, store, and market them carefully, they should find a ready market. Here are some tips on harvesting apples for storage.

Immature apples do not store well and are especially likely to scald. For best storage, apples should be mature but not ripe.

Usually the first apples of a variety to be picked do not store well. These first pickings should go to market rather than to storage. The last-picked apples of a variety also do not store well because they usually are too close to being ripe. They also should go to market.

The prime apples for storage are those that are harvested during the middle of the picking season for that variety. They are mature and are less likely to scald, yet are not ripe and have a good storage life left.
In determining maturity for storage, cut the apples and look at the flesh. The flesh should have lost its greenish color and changed to white or pale yellow. It should not taste "starchy." It should be firm, snappy, and juicy without any grainy texture. Flesh starting to show graininess in texture is too ripe for storage.

The logistics of harvest make it almost impossible to harvest every apple at the best stage of maturity. However, careful programming will help. Special care should be given to the apples going into storage.

TREATING FOR SCALD

Apples picked at proper maturity and removed from storage by January 15 probably should be treated for scald as a safety factor.

Either DPA or ethoxyquin may be applied as a spray or a drench or by flooding before storage. Treat for a few seconds up to 30 seconds. Coverage and scald control tend to be better with fruit and solutions at room temperature than with cold fruit or cold solutions.

SUGGESTED DATES FOR STARTING APPLE HARVESTS

Dr. Lott has suggested the following dates for starting apple harvest in an average season. Maturity will be about ten days later; ripeness, several days after maturity.

<table>
<thead>
<tr>
<th>Area</th>
<th>Jonathan</th>
<th>Red Delicious</th>
<th>Golden Delicious</th>
</tr>
</thead>
<tbody>
<tr>
<td>Union-Jackson Counties</td>
<td>Sept. 1</td>
<td>Sept. 6</td>
<td>Sept. 15</td>
</tr>
<tr>
<td>Centralia</td>
<td>Sept. 6</td>
<td>Sept. 11</td>
<td>Sept. 20</td>
</tr>
<tr>
<td>Jersey-Calhoun Counties</td>
<td>Sept. 8</td>
<td>Sept. 13</td>
<td>Sept. 22</td>
</tr>
<tr>
<td>Quincy</td>
<td>Sept. 14</td>
<td>Sept. 19</td>
<td>Sept. 25</td>
</tr>
<tr>
<td>Lake County</td>
<td>Sept. 24</td>
<td>Sept. 29</td>
<td>Oct. 4</td>
</tr>
</tbody>
</table>

Every fall buyers attempt to rush the apple harvest season by offering high prices for early-picked apples. Economically speaking, it probably is wise to sell some apples on this early market. But too many early-picked apples can drive the price down rapidly.

As you are well aware, food prices are now on the upward swing and predicting what they will do in the near future is only an "educated guess." But if we pick and sell apples with restraint this year, apple prices should not drop as rapidly or as much as in previous years.

In brief, apple marketing prospects look good this year if we don't "louse up" the deal.

INSECTS

This is a very dangerous season to assume you have all pests under control as you go into harvest. Codling moth has amazing ability to pepper an area with new entries. Red mites can rapidly increase numbers up to now and will soon
begin laying overwintering eggs which are often placed in the calyx end of apples as long as they are on the tree. We have had very little trouble for several years with red-banded leaf roller but watch for it anyhow. In Area D the apple maggot is sometimes numerous for two weeks into September or longer.

This means that unless you have applied a protective spray you should patrol the orchard at least twice a week. It may be much more economical to take just a short time to check those parts of the orchards you are not normally in. Most growers who have been operating an orchard a few seasons know where "trouble" usually occurs first, and those are the spots to check regularly.

Assistant Professor of Plant Pathology

Ron Meyer Fruit Entomologist

Daniel B. Meader Extension Horticulturist

Malcolm C. Shortliffe Extension Plant Pathologist

The Illinois Cooperative Extension Service provides equal opportunities in programs and employment.
Plan now to attend the Annual Meeting of the Illinois State Horticultural Society January 15-17, 1974, at Augustine's Ramada Inn in Belleville. This is the program.

January 15  7:00 p.m.  President's Reception, Buffet Dinner, and Slide Show "Who Will Control Agriculture" by Harold Guither, University of Illinois Economist.

January 16  9:45 a.m.  Greetings from President Allen Myers.

                    10:00 a.m.  Fruit Growing in Arkansas, Roy Rom, University of Arkansas Horticulturist

                    10:45 a.m.  National Peach Council News and Growing and Selling Peaches, Carlton Stewart, Campbell, Mo. peach grower.

                    1:45 p.m.  Prospects for Processing Apples in Illinois, Jarvis Fransblau, Manager, South Pass Processing Plant.

                    2:15 p.m.  Report from Ross Kelly, Secretary-Manager, Illinois Fruit Council.

                    2:30 p.m.  Mechanical Harvesting, Rodney Bull, Michigan fruit grower.

                    3:45 p.m.  Discussion on the use of Ethrel and other orchard practices, led by Chris Doll and Dan Meador.

                    7:00 p.m.  Banquet

January 17  9:30 a.m.  Business Meeting.

                    9:45 a.m.  University of Illinois presents:

                    Calcium Treatments for Apple Disorders, Dan Meador
                    Recent Developments in the Department of Horticulture, C.J. Birkeland
                    A Look at Fruit Finish, Roy Simons
                    Summary of Leaf Analysis Results, John Titus
                    Consider Growing Blueberries in Southern Illinois, James Mowry
Repelling Birds in Blueberries and a Small Fruit Report, Bill Courter
Ground Covers for Mite Management, Ron Meyer.

1:00 p.m. Fruit Research Work in Arkansas, Roy Rom
1:45 p.m. The Energy Crisis (speaker to be selected)

FERTILIZER SHORTAGE

There is considerable publicity now about a fertilizer shortage. If you have tried to buy fertilizer lately, you may have found your dealer’s stocks are low. We suggest that you talk to your dealer about your fertilizer needs now. Also, be ready to accept fertilizer whenever it is available.

WATCH FOR MOUSE ACTIVITY

During the winter months periodical walks through your orchard looking for signs of mouse activity will give you a chance to correct "hot spots" before serious tree damage occurs. Edges of the orchard adjacent to woods or other non-cultivated areas are especially vulnerable to reinfestation.

PRUNING

The old rule-of-thumb says prune grapes first, then old apple trees, then young apple trees, and then peach and other stone fruit trees last. Another rule says that during December and January, you should confine pruning on apples to small cuts. If a large cut is necessary, leave a two-foot stub and cut it off later.

Pruning cuts cause an injury to the bark in the area of the cut. Such areas are more susceptible to cold injury.

Economics and time limitation often prevent us from following these rules completely. But if we have to take chances, take them with the oldest trees.

OZARK GOLD APPLE

If you have a retail stand or a U-pick operation, would you like to have a yellow apple ripening about 3 to 4 weeks before Golden Delicious? If so, perhaps you should try a few trees of Ozark Gold. It has an attractive, smooth, yellow skin with a red blush. Its flavor is slightly more tart than Golden Delicious, but not as tart as Jonathan.

One Illinois orchard has 50 Ozark Gold trees that bore their first fruit in 1973. The U-pick customers quickly cleaned the trees. Ozark Gold's acceptability by the wholesale trade has not been tested, but it should not suffer much competition from immature Golden Delicious.

DISEASES

Annual winter pruning is about to begin. The incidence of two diseases can be significantly reduced if proper pruning practices are observed. Good orchard sanitation is a primary control measure for black rot (frogeye leaf spot)
and fireblight of apple. During the winter months, remove all mummified fruit and prune out all dead, cankered, or infected wood to reduce the carryover of the fungus. Remove this wood from the orchard and destroy it by burning.

Remember: A SINGLE dead twig that is one-fourth of an inch in diameter can have 10 or more pycnidia on a single inch, with each pycnidium producing 1,500 spores. Do not leave pruning stubs. These die back and are a source of black rot and Botryosphaeria rot inoculum. Make all pruning cuts close.

Judicious pruning on fireblight-susceptible varieties in the winter months can reduce the incidence of this disease. Make pruning cuts 2 to 4 inches below the fireblight canker, and sterilize pruning tools before making another cut. Use 1 part Clorox (or other household bleach) in 4 parts of water. One canker will supply sufficient inoculum (bacteria) to infect an entire orchard in the spring.

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