

## KENTUCKY FRUIT NOTES

W. D. Armstrong, Horticulturist, Editor

### PREVENT FIELD-MOUSE DAMAGE THIS YEAR

L. C. WHITEHEAD,

U. S. Fish and Wildlife Service

In many Kentucky localities fruit growers will be confronted with a "field-mouse winter" this year, and the "alert" should therefore be sounded. Because field mice often damage fruit trees extensively during the winter months when other food is scarce, growers can ill afford not to include the control of field mice in their regular orchard management operations during the late fall months. The sooner this work is done, the more effective it will be in preventing damage to the trees during the winter season. All indications point to a much heavier-than-usual infestation of field mice this year.

Both the meadow mouse and the pine mouse cause damage in Kentucky. The pine mouse burrows and lives and feeds mainly under ground, whereas the meadow mouse feeds largely on the surface, although it builds shallow burrows and nests underground. The pine mouse girdles the roots of trees, while the meadow mouse girdles tree trunks at the ground surface. Poison baits and methods of baiting are generally similar for both kinds of field mice. A sleet storm followed by heavy snowfall that completely covers the ground and abruptly cuts off the surface food supply of the field mice, may cause the meadow mice, particularly, to girdle a considerable number of 10- to 15-year-old trees, even when the mouse population is quite low.

#### Cultural Practices to Protect Trees

In mowing, don't leave continuous strips of tall grass in the tree rows, especially on old terrace ridges or mounded strips developed through several years of one-way cultivation. Mice are prone to concentrate on such ridges. Heavy

mulching also affords protection from natural enemies and therefore attracts the mice.

In any event, as meadow mice generally feed in afternoon daylight, and as they avoid exposed places for fear of such natural enemies as owls, hawks, snakes, skunks, foxes, cats, and dogs, it is worth while to remove in the summer all vegetation within a radius of 2 feet of each tree trunk.

#### Control by Poisoning

Late in the fall, meadow mice and pine mice are best controlled with cut apple bait treated with U. S. Fish and Wildlife Field Mouse Rodenticide, when there are few dropped apples. Poisoned oats bait of steam-crushed oats treated with alkaloid strychnine is convenient to use and is especially effective in winter and in follow up work in late spring and summer months.

**Orchard examination.**—In early fall examine the orchard for mice signs. Put out poison bait, if and where mice are present. Meadow mice can be detected by surface runs in grass, open trails around fence rows, rock outcrops, rock walls, low spots. Pine mice can be detected readily by **probing** the soil around the trees in the orchard with a stick about  $\frac{3}{4}$  inch in diameter; when the stick pierces a pine-mouse runway or burrow about 2 to 10 inches under ground, there will be a distinct "drop" of the stick. "Breather holes" from these underground runways are also to be found when pine mice are around.

#### Time and manner of application.

One application of bait, generally after harvesting in the fall, should give protection for one season, unless the fall is late. The orchard should be re-examined after fall baiting, during the winter and in early spring, as reinfestation may occur, making additional poisoning necessary. If girdling occurs, baiting is necessary before bridge-graft-

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ing. Use 3 or more apple-bait spots per tree; and if there are many drops 1 teaspoon (or better, 1 tablespoonful) of the strychnine-treated steam-crushed oats bait should be placed beside each apple bait.

**Bait exposure.**—In meadow mouse runways in long grass, insert each bait in the active runway and place grass back over the bait; in short grass, use a handful of mulch or pulled grass to cover the point where bait is placed, as mice will take covered bait better. Covering also prevents the poisoning of other animals and birds.

**"Concentration-station" methods.**

—Where surface trails do not occur or are poorly defined in light grass, some type of concentration station is most useful. This is particularly true in baiting for pine mice. Concentration stations consist of a forkful of hay, mulch, old sacks, bundles of corn fodder, box ends, wood slabs—but best of all, asphalt squares about 18" x 18", cut from rolls of 3-ply roofing paper. When squares are placed flat over breather holes, mounds, or other active-looking spots after the last mowing and at least 10 days before poisoning, pine mice, if present, will almost invariably make active runways thereunder. At least one square should be placed per tree within the drip line. Squares can be raised with little chance of debris falling into fresh runways and on the bait placed therein. Both apple and oats baits may be used under such stations. Place 2-3 pieces of apple bait under each station and a rounded teaspoonful or level tablespoonful of oats bait.

In young orchards and in heavy mulch, such stations should not be solely depended on to control meadow mice, especially in years when there are many mice. Such stations may be used, however, in addition to live-trail baiting in "middles" and other areas not near stations.

Even when using concentration stations for pine mice, one apple bait should be put in each breather hole. If concentration stations are not used, four or more breather holes or holes made by probing must be baited per tree.

**Rechecking.**—Through the use of the covers, it is possible to recheck for any mouse activities every week or so at any time of the year. Re-

bait only at such covers where fresh signs of travel in the burrows may show up. The use of covers is the only easy way of immediately detecting re-infestation from other areas.

**How to Make the Bait**

**Apple-rodenticide bait.**—Use ripe but firm varieties which bruise least. Cut into ½" to 1" cubes—the 1" cubes more nearly plug the runway and mice will run over smaller cubes. Peeling or coring is unnecessary. One quart of apples makes about 100 cubes. Use 30 grams of rodenticide (entire contents of the friction-top container), to 20 quarts of cut apples; or, 1 level teaspoonful to 1 quart of cut apples. Place a definite quantity of cut apples in a large enamel pan, gradually sift on **the correct amount of rodenticide**, place cover on pan and shake with rolling motion, until the rodenticide is equally distributed; or, sift the rodenticide on the cubes in the pan while stirring them with a spoon or stick. Five quarts of this bait can usually be exposed by one man in a half-day. **The bait must be prepared fresh every day!**

**Steam-crushed oats bait.**—The steam-crushed oats bait, treated with rodenticide or alkaloid strychnine, is the best grain bait for field mice and is made under the supervision of the U. S. Fish and Wildlife Service.

**CAUTION.**—As both these baits are violent poisons, every effort should be made to keep them from other wildlife and all animals, children and unsuspecting persons.

Additional information on these poison baits may be obtained from W. W. Magill, Secretary of the Kentucky State Horticultural Society, Lexington, Kentucky.

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**1944 KENTUCKY FRUIT EXHIBITS**

Two noteworthy fruit exhibits were held in Kentucky this year—at the Kentucky State Fair late in August and at the Harvest Festival of Eastern Kentucky held at the Robinson Experiment Station, Quicksand, September 28-29.

**State Fair.**—While the State Fair was held earlier than usual and apples were not highly colored, the beautiful color and finish of the

large peach and grape exhibits more than made up for the lack of apple color. The quality of all of the fruit was excellent, showing that great care had been exercised in its production and selection inasmuch as it is generally recognized that 1944 has been the worst codling-moth year in recent history.

First prize in the large 20 tray-20 plate apple exhibit went to the McCollom Orchards of Henderson, and second prize went to J. W. Fegenbush Orchards of Buechel. In the individual grower's exhibit the J. W. Fegenbush Orchard took first while the Karcher & Harpering Orchard of Jeffersontown took second. Top grape honors went to the Joe Bray & Sons Fruit Farm of Bedford, with second place going to Karcher & Harpering. Top peach honors were divided between Fred J. W. Wirth of Louisville, and Joe Bray & Sons, of Bedford, with some nice peach winnings also made by the Karcher & Harpering Orchard at Jeffersontown and the Kentucky Cardinal Orchard at Henderson. Of outstanding interest among the apple bushel, tray, and plate competition was the exhibit of the Lester Harris Orchard of Kevil in McCracken county. This was the first time fruit from this fine young orchard has been exhibited at the State Fair and it won sweepstake honors for the best bushel of apples, best tray of apples, and best plate of apples with Golden Delicious, as well as first prize on trays and plates of other varieties. It is hoped that this is the starting of many more successful fruit exhibits to come from this orchard.

**Eastern Kentucky Harvest Festival.**—As the Eastern Kentucky Festival at Quicksand was held in late September, the fruit exhibited there was limited to apples. By that time, good color and quality had developed and this year these exhibits showed unusual finish, color, and quality. The entries in the home orchard plate class were far above normal in numbers and quality, as were also the commercial plate entries. First prize in the commercial orchard exhibit went to Wendell VanHoose and family of Paintsville. Young Mr. VanHoose is now sole operator of the orchard that was operated jointly by him and his father, the late Senator Fred Van-

Hoose of Paintsville, outstanding fruit grower of eastern Kentucky, who died earlier this year. The second prize in the commercial exhibit went to W. J. Woodward, of Boreing in Laurel county. This was Mr. Woodward's first exhibit, and his fine apples were the envy of many who visited the Festival. In addition to the standard varieties exhibited, there were several very fine seedling apples on display and it is hoped that next year special prizes for worthy seedling apples can be awarded.

Some of those usually making large exhibits were absent this year from each of the exhibits, or had only smaller exhibits. It is hoped that in the future these and other new exhibitors might exhibit their good fruit at the Fairs. It should be pointed out that during the present labor shortage it was a hardship for any grower to prepare a fruit exhibit and much credit is due these men for their efforts.

### MULCH WORTH \$265.00 PER ACRE

W. D. Armstrong

Strawberry mulch applied in early December of 1943, as compared to a March 1944 application, was responsible for 34 extra crates per acre in the mulched experimental plots in McCracken county, this year. One and one-half tons of straw, per acre, were used. Yet the winter was considered mild, with 4 degrees above zero in late December, 7 degrees one night during January and 7 degrees again during February. However, on May 7, one week before Blake-more harvest started, we had an untimely frost and freeze over western Kentucky that seriously reduced the crop by freezing blossoms and small fruit. The December-mulched plots produced 104 crates per acre, or 34 crates per acre more than the March-mulched plots. With berries selling at ceiling prices of \$7.80 per crate, the berries mulched early brought \$265 per acre more than the others.

During the 1943 harvest season, similar experiments gave an increase of 44 crates per acre in favor of December mulching (December temperature reached 10 degrees above zero), while the harvest records taken in 1940 gave an increase of 80 crates per acre in favor of

the December mulching as compared to March mulching. This great difference was due to sub-zero temperatures (-10 degrees) in January, with no snow on the ground. That spring, many unmulched fields in Southwestern Kentucky failed to bloom or had a very light blossom, because the sub-zero temperatures killed the embryonic flower cluster, causing the crown to turn dark, and also killed a large percentage of the roots. At harvest season an abundance of new runners, from 2 to 3 feet long, were present on the berry plants having no bloom or berry clusters.

Many berry-growers of the district visited our experimental mulch plots at harvest time that year to see and be convinced, from observations, that a December mulch as compared to a March mulch, could be responsible for such a difference. Similar failures to bloom had occurred in several previous years, especially on Aroma variety, and this condition had been wrongly interpreted as a "running out" of the variety. For lack of more descriptive words, such barren plants with wild, early runners had for some years been locally called "he plants."

The greatest objection to fall mulching among growers is the fact that the fields often become fouled by the volunteer wheat, cheat and other seeds in the mulch. This is largely prevented by growers who spread their bales of straw in the berry middles, clipping the wires, in October or early November, to let the fall rains wet the baled straw, germinating most wheat seeds before it has to be spread. The custom of mowing a rye field as it begins to head out, but before the grain forms, then raking and stacking for the winter mulch, is a splendid practice.

Strawberry growers of central and northern Kentucky have long since learned the profit and benefit of late fall or early winter mulching. In those sections 2 or 3 tons of straw per acre are used.

In all sections the mulch should be applied late in the fall or early winter when it seems likely the temperatures will go as low as 15 degrees above zero. Temperatures this cold, before Christmas, cause considerable damage to unmulched plants, especially in first-year patches with thin stands.

## HINTS AND OBSERVATIONS

By W. W. Magill  
Field Agent in Horticulture  
G. I. Joe

When G. I. Joe returns home, will there be any strawberries for him to eat? They will serve as one home-grown luxury that will be more appetizing than the "C" and "K" rations he has been eating. One hundred twenty Kentucky counties should plant strawberries next March and early April, at least for home use.

### 500% Interest

A small investment in buying strawberry plants and planting an acre, next March, will be a fine "bond" to give G. I. Joe on his return home. With dad's leadership and the cooperation of mother and the younger children, this can be done by many families in commercial berry areas. Think it over—you owe it to Joe.

### Fires?

Last winter, four orchards were swept by accidental fires. In each case, I expressed an opinion to the owner, soon after the fire, that the trees were ruined. Sorry—but I guessed correctly.

### \$4,000 in 20 Minutes

An alert mind and a handy tractor disc saved an orchard, after the fire broke out. May I suggest you do not wait until the fire breaks out to use the disc and make a fire barrier on four sides of the orchard, and also a few strips in each direction in the orchard.

### No Consideration

It is unfortunate that the insects don't give us a break and become inactive for the duration. Let me suggest that you read Mr. Armstrong's "scale" article again as it appears in this issue, and also be thinking about how you can reduce your codling moth "seed stock" by scraping trees.

### Safe vs. Sorry

The war is not over yet, and sprayer parts may be on the "slow delivery" list again in 1945. Better order your needs **now**.

### Yes, They Died

Many years before our time, the "Red Man" barked forest trees to kill them, and it worked. Orchard mice may likewise kill your apple trees. Mr. L. C. Whitehead has an article on this subject, in this issue. Read it carefully, and save for future reference. If you can't buy the poison at your local dealer's, write me at once. "Root Rot" has been given credit for killing many Kentucky apple trees, where the orchard mouse was guilty.

### SAN JOSE SCALE SITUATION

San Jose scale made more headway in the summer of 1944 than in any season since 1938. The continuous hot dry weather has been ideal for scale development and multiplication and the increase has been enormous. In many orchards where the owner thought there was no scale at all or only a very little, the insect has developed so fast that now many limbs and whole trees are completely crusted with scale. **This general scale condition makes the dormant spray more important this year than in most any recent season.**

While many growers do not recognize scale on the trees, it is more readily observed as it affects the fruit from these trees. Such fruit often has the small tell-tale red spots slightly larger than the head of a pin, with the small scale attached to the center. If your peaches or apples had many such spots it is almost certain that they were caused by scale, and a close examination of the 1-, 2-, and 3-year wood will likely disclose many of the small roundish grey scale insects of various sizes. Severe scale attacks have been known to ruin many fine orchards in Kentucky, and if a very thorough and complete dormant spray is not applied in infested orchards this winter or very early spring, serious losses are almost certain to follow. **Remember, the spray for scale demands more complete coverage than any other spray, because any scale not covered will survive and multiply next season.**

#### Materials

It is generally considered that 3% oil emulsion spray is one of the best dormant scale sprays for Kentucky.

The usual recommended strength of oil spray is 2%, but in periods of heavy infestation the 3% oil is more desirable. This oil spray can be combined with a 6-6-100 bordeaux when spraying peaches and this combination will take care of both the scale and the peach leaf-curl disease. In apple spraying, the bordeaux is usually left out, though a small amount is often used as an emulsifier for the oil. Directions for mixing this spray as well as general spraying information on all Kentucky fruits is contained in Experiment Station Bulletin 393, "Fruit Pests and Their Control," which can be had free of charge upon request to the Experiment Station at Lexington.

Dormant strength lime sulfur would be the second best in scale control. For severe cases, this should be applied at the strength of 12½ gallons of lime sulfur to 87½ gallons of water, making 100 gallons of spray mixture. This spray will control peach leaf curl on peaches and, when applied in the late dormant or early delayed dormant stage of apples, is also considered a valuable early apple-scab spray. Dry lime sulfur is not considered as effective in scale control as either liquid lime sulfur or oil, and should not be used for that spray when either of the other two is available.

### INSECT DAMAGE TO THE 1944 PEACH CROP

P. O. Richter

The 1943 survey of insect damage to the peach crop was so successful that it was repeated in 1944. Mr. Armstrong and the writer made the survey early in August during Elberta harvest. Dropped and picked fruit from a number of western Kentucky orchards was opened and examined and peaches were inspected as they were being graded in the packing sheds.

The crop as a whole was much cleaner this year than last even though some orchards had smaller crops in 1944. This year only 20 percent of the peaches examined were injured by insects, while in 1943 fully one-third of the crop was damaged. The lighter damage was due mainly to the small amount of cat-facing this year compared to

last. Brown rot which often follows insect injury was scarce this year due to the very dry weather.

**Curculio.**—Curculio control was very good in most orchards, especially where the month-before-harvest spray had been used. It was very evident from the counts that again curculio damage is much worse on the edges of an orchard than deeper within the orchard. This means that many growers could well afford to do some extra spraying on the outside rows. Also, in many cases it might be possible to omit the month-before-harvest spray except on the outer 6 or 8 rows.

In a Paducah peach orchard where curculio has always been a problem, 34 percent of the peaches on the outside row were wormy. Ten rows inside the orchard, however, only 7.8 percent were injured. At Henderson, in one orchard, only 2.9 percent of the peaches were curculio-injured where no second-brood spray was applied. However, trees in the fifth row from the orchard edge, adjacent to an old neglected peach orchard, had 21 percent wormy peaches.

**Oriental Moth.**—In general, injury from the oriental fruit moth was lighter than in 1943. One Paducah orchard, however, had 26 percent of the fruit injured by oriental moth in one section of the orchard and there was much oriental injury at the Eison orchard near Ledbetter.

Other observations of oriental moth during the year indicated that the insect was less numerous in twigs than usual. Rearings showed very few parasites present this year. It seems likely that such damage as occurred was due partly to lack of parasites and partly to the dry weather which stopped twig growth, forcing the oriental worms to enter peaches.

**Cat Face.**—Cat-facing was a minor cause of defective peaches this year. Where last year damage ranged from 10 to 18.7 percent, this year it ranged from 0.9 to 5.8 percent. This decrease was especially remarkable since some of the orchards in which counts were made had a much lighter crop than last year.

## QUINCE RUST AND CEDAR RUST CONTROL

The comparatively new fungicide known as "Fermate" has shown considerable promise in fruit-growing circles and much research is under way to determine its scope of usefulness. It has given good results in apple-scab control, cedar-rust control, black-rot control, and shows promise against bitter rot.

Because of a large native growth of red cedar just across the road from the apple plots at the Western Kentucky Experiment Substation at Princeton, these plots have for some years suffered a heavy loss from both quince rust and cedar rust. These diseases are closely related and overwinter on the red cedar trees. In early spring, during rainy weather, spores develop on these diseased lesions and are blown back to apple leaves and fruit—though quince rust apparently attacks the fruits alone, causing many small fruits to drop and severely distorting many others. These infections come very early and many fruits are caused to drop soon after the calyx period.

In order to study the effect of Fermate on quince rust under Kentucky conditions, spray plots were set up in the above-mentioned plots that consist of double rows of Stayman, Delicious, and Winesap trees. Starting with the pink spray and extending through the second cover, including full bloom, calyx and first cover, the east row of each variety was sprayed with a mixture of 3 pounds of wettable sulfur and ½ pound Fermate per 100 gallons. The west row of each variety had an equal number of sulfur sprays; the pink spray being 2 gallons of lime sulfur and the others were wettable sulfur, six pounds per 100 gallons. Of course, the calyx, first and second cover sprays also contained lime and arsenate of lead. All trees received a delayed dormant and pre-pink spray of 2 gallons of liquid lime sulfur per 100 gallons of water.

Drop pick-ups were started early in June under six pairs of trees of each variety. These pick-ups were continued up to harvest time. The average numbers of quince and cedar rust drops per tree, and the

percentage of total drops, were as follows:

**Sulfur plots (West Rows)**

Stayman 1509 rust drops, 58% of total preharvest drops  
 Delicious 256 rust drops, 52% of total preharvest drops  
 Winesap 462 rust drops, 48% of total preharvest drops

**Sulfur—Fermate plots (East Rows)**

Stayman 159 rust drops, 10% of total preharvest drops  
 Delicious 19 rust drops, 2.7% of total preharvest drops  
 Winesap 49 rust drops, 7% of total preharvest drops

Thus it can be seen that there were many times more rust infected drops from the sulfur trees than from those getting sulfur plus fermate. On the other hand, there was a higher percentage of noninfected or regular drops per tree from the sulfur-fermate trees. This indicates that some fruits on the sulfur trees that would have ordinarily made regular drops were infected with rust as well as a great many that would have otherwise developed into normal fruits. Yield of picked fruit and percent of infection with quince rust are shown in Table 1.

Table 1.—Average number of bushels harvested per tree and percentage of rust-infected fruit

Variety	Sulfur		Fermate Sulfur—	
	Bushels	% Quince Rust	Bushels	% Quince Rust
Stayman	8.5	5.0	13.5	.58
Delicious	7.0	1.9	9.0	.07
Winesap	11.0	1.6	12.0	.30

The sulfur-fermate trees of each variety produced more apples than those getting sulfur alone. With Stayman the advantage was 5 bushels per tree, with Delicious 2 bushels per tree, and with Winesap 1 bushel per tree. The harvested fruit of all varieties also showed a much higher percent of rust-infected fruits in the sulfur than in the sulfur-fermate combination plots. This was not serious at harvest since the rust had caused most of the infected fruits to fall earlier.

Because of the importance of apple scab, some harvest notes were taken

on this disease. In all cases the scab percentage was very low. The better control of scab on Delicious was had with sulfur-fermate, while sulfur alone gave slightly better control on Winesap and Stayman.

In summarizing it should be pointed out that the three varieties in the test, Stayman, Delicious and Winesap, all produced more apples per tree when sprayed with the mixture of three pounds of wettable sulfur plus ½ pound fermate and also had fewer rust infected drops and fewer rust-infected fruits at harvest than did trees getting a straight sulfur spray. Of the three varieties used, Stayman was most seriously affected, Delicious and Winesap suffered somewhat less. Apple scab control was also satisfactory with the combination spray.

These results are in line with other work with cedar rust, but the data on quince rust are new. Where a grower has a situation that makes cedar rust or quince rust a threat, especially in wet springs, as it was in many orchards in 1944, it would seem that fermate offers specific relief. Where combined with sulfur, ½ pound of fermate replaces three pounds of sulfur. Fermate is also compatible with summer oil and with fixed nicotine sprays. This and other new materials should be watched and used where there is a need.

### A SUGGESTION ON STRAWBERRY PLANTING

In both 1943 and 1944 many strawberry fields were not planted because the soil was not prepared in time, due to spring rains and other delays. Many growers realize that late planting is often worse than not planting at all. An excellent practice for the strawberry man is to plow and condition his field in the late fall. Early spring planting can then be done with little preparation with disc and drag or no further preparation at all. Many growers regularly plant strawberries in tobacco fields that have not been stirred since the previous summer and get their new patches off to an early start. Steep land subject to erosion should be planted on the contour.

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