

## KENTUCKY FRUIT NOTES

W. D. Armstrong, Horticulturist, Editor

### MAILING LIST NOTICE

As stated in the October issue, only those who returned the post card, or made a special request, are listed to receive this issue of Kentucky Fruit Notes. Perhaps some of your neighbors forgot to sign and return the card. They can still have their names added by returning the signed card or by writing to the Kentucky Agricultural Experiment Station, Lexington, Kentucky. Some county agents are passing on requests turned in to them by growers in their counties.

### STRAWBERRY CROWN BORER CONTROL

P. O. RITCHER

Department of Entomology  
and Botany

Strawberry growers should resolve now to get the jump on the crown borer during 1943. The latest developments on crown borer control are the results of five years of study by the Agricultural Experiment Station, and include two new control measures.

#### Life Cycle and Habits

The adult crown borer is a black and brown beetle about the size of a grape seed and cannot fly. Few growers have seen the adult since it is small, plays possum when disturbed and feeds only on the undersides of the leaves. For the most part, the winter is passed in the adult stage. Right now great numbers of the beetles can be found

hiding under trash or in the soil about the plants in old strawberry patches.

Adults become active on warm days in February and March and eat holes in the strawberry leaves from the underside. Egg laying begins in March and continues through August. The eggs are laid in holes gnawed by the females in the crowns or old leaf-bases of berry plants and then covered with bits of tissue and dirt after being deposited. They cannot be removed by washing. The eggs hatch into legless, crown borer grubs which tunnel through the crowns of the plants. By late June their feeding causes many dying or stunted berry plants that are especially noticeable in new plantings.

Full-grown borer grubs go through a resting state and change to adult beetles inside the plants, beginning in late June. These new adults chew their way out, feed for a time on strawberry leaves and then hibernate until the next spring when they start the cycle over again. There is usually one generation a year but in some seasons we have found a small second brood as well.

The crown borer is very restricted in its feeding habits and the kind of plants in which it can breed. In Kentucky it breeds only in the cultivated strawberry, wild strawberry, and in a weed called common cinquefoil (or five finger). Cinquefoil is very common on many farms in the western half of the state.

BULLETIN OF THE KENTUCKY AGRICULTURAL EXPERIMENT  
STATION, LEXINGTON, KENTUCKY

## How Crown Borer Spreads

Growers spread crown borers to their new patches in several ways. One is by placing the new patch next to or near an old, infested berry patch. The adult crown borers then have only to walk over to the new patch and begin egg-laying. The same is true of patches set next to or near conquefoil. The other common way of getting crown borer is by the use of contaminated plants to start new patches. Adults may be hiding among such plants or if the plants are dug after March 1 they may contain crown borer eggs as well.

## Cultural Methods of Control

As a result of studies made in western Kentucky in 1937 and 1938, certain cultural methods for getting rid of crown borer were recommended. It was suggested that growers set new strawberry patches with plants which had passed state inspection or had been dug and carefully cleaned before egg-laying began (usually early in March). To keep new plantings from becoming infested after setting it was further suggested that new patches be located at least 350 yards from the nearest borer-infested strawberries or conquefoil patch. Growers were advised to destroy old patches and to pick no patch more than two years since old berry patches frequently breed up enormous numbers of crown borers.

Some growers were able to solve their crown borer problem by using these cultural methods of control. In 1937, for example, Mr. Clarence Seaton of Kevil dug plants early in March from an infested patch then cleaned and washed them **to remove crown borer adults**. These plants were used to start an acre of Aroma strawberries in a new location sev-

eral hundred yards from the nearest old patch and they proved to be free of crown borers. The following year he picked over 200 crates of berries. Another planting using late-dug plants from the same field was a total failure from borer damage.

## Fumigation of Plants

Since considerable labor is involved in digging plants early, cleaning them and heeling-in until planting time, a search was made for some other way to free berry plants of crown borer. As a result of many experiments carried on during the past three years the use of methyl bromide fumigation has been developed and tested extensively under field conditions.

Methyl bromide is a remarkable new gas which is being used elsewhere to solve many difficult insect problems. It can penetrate a tightly packed crate of dormant strawberry plants and kill crown borer of all stages without any injury to the plants. The fumigation must be done in a tight chamber and to be sure of results the dosage of gas, temperature, humidity and treatment period must be carefully regulated. Also, since the gas is poisonous to human beings great care must be exercised in its use.

The dosage found necessary to kill all stages of crown borer is 3 pounds of methyl bromide per 1,000 cubic feet of space for a 2-hour period at temperatures above 65 F., and the temperature of the plants fumigated must be above 65 F. Fumigation with this dosage has not injured dormant Blakemore or Premier plants. Work with the Aroma variety has not given uniform results to date and further tests should be made before treatment on them can be recommended.

Because of its nearness to the



Experiment Station at Lexington, the Louisville berry growing area was selected last spring (1942) for a trial of fumigating berry plants under practical conditions. During the third week in March a 50 cubic foot fumigator was taken to Buechel where over 84,000 Premier plants were fumigated, enough plants to set twelve acres of berries. Patches set with these plants are now growing in the Louisville area. Growers interested in seeing for themselves how fumigation affects berry plants should see these patches.

### Crown Borer Bait

In localities where strawberries are grown extensively or where cinquefoil is abundant it is frequently impossible for growers to set new patches where they will remain uninfested, even though they use clean plants at the start. The use of materials to kill adult crown borers migrating into new patches before they could lay their eggs would seem to solve this problem and fit in well with the use of fumigated plants. The poison baits recently developed by the writer have proved effective for this purpose.

One good bait for killing crown borer beetles was found to be a commercial material made of 96.5 per cent dried, chopped, apple refuse coated with 3.5 per cent sodium fluosilicate. Another good bait was prepared by drying fresh apple pomace left after cider making and coating it with 2.5 per cent by weight of lead arsenate. Both proved effective in field tests, killing from 65 to 100 per cent of the adults present in ten days time. In one field experiment at Lexington, baiting during April, May and June killed enough adults to reduce the number of infested plants over 80 per cent.

Baiting is economical only on new patches. The material is applied by dropping a half teaspoonful of bait in the crown of each plant. A fertilizer horn can be used to advantage in applying the bait. The first baiting should be made to the entire patch soon after setting. If the patch was started on clean land with clean plants, later baitings at 10-day intervals may be made only on the outside fifteen or twenty rows. To bait an acre requires about 50 to 100 pounds of bait.

Two growers who have given poison bait a trial and reported good results are Lester Harris of Paducah and J. M. Tucker of Buechel.

### THE FERTILIZER SITUATION

By A. J. OLNEY

Head, Department of Horticulture

Since a large part of our nitrogen supply is needed for munitions, the use of nitrogen for fertilizer is restricted by order of the War Production Board.

Naturally, fruit growers are concerned about the amount of nitrogen fertilizer that will be available to them in 1943. At the time this is written, no definite statement can be made. It is expected that approximately  $\frac{3}{4}$  of the amount previously used will be released. In any event it seems clear that we must depend on less nitrogen fertilizer than usual, for the duration. Fruit growers are well aware of the fact that nitrogen is an essential factor in maintaining the degree of vigor necessary for good fruit crops. It is believed that most fruit growers will be able to keep up production if three-fourths of the amount of nitrogen formerly used can be obtained and the fertilizer put where it will do the most good.

Old trees and those that have a poor record should be eliminated. Trees that made a strong growth last year will not require fertilizer

this spring and most young and non-bearing trees usually can be kept vigorous without the use of nitrogen fertilizer. Trees that have been bearing heavily will need to be fertilized. Probably it will be advisable to split the application on apple trees, using about half the amount in March to aid fruit set, and the second half about June 1, on the trees carrying the heaviest crops. For peaches, the use of fertilizer probably should be delayed till the frost period is past and the crop is set. Where the amount of nitrogen available seems inadequate to maintain vigor, the pruning should be more severe than usual. The reduction of the top of a tree will reduce its nitrogen requirement but will also reduce its producing capacity, hence too severe pruning is not desirable.

During the period that fertilizers are limited, special attention should be given to soil management practices. On most soils, clean cultivation results in excessive erosion and depletion of nitrogen reserves. Thus, it would seem advisable to seed orchards to a more or less permanent cover crop and this will help to reduce labor costs. Lespedeza has proven to be an excellent cover in many orchards for a number of years, and it is one of the best legumes for this purpose. Alfalfa, sweet clover and red clover have been used with some success. The growing of legumes results in the fixing of considerable quantities of atmospheric nitrogen in compounds in the soil, which makes legumes more important than usual. Since legumes are not as effective as grasses in preventing erosion, a mixture of legumes and grasses should be used on steep sites. Where manure is available, even small amounts placed around the trees will be beneficial. Mulching materials placed around trees will also

furnish some nitrogen, after these decay, especially if legume hay or clippings are used. Newly added mulches should contain some animal or poultry manure to furnish nitrogen until the mulch starts to decay.

Because conditions are variable, no simple formula can be stated that will provide the best way to maintain fruit production on individual farms. The fertilizer industry has pledged itself to distribute all fertilizers equitably among consumers. The use of nitrogen on certain non-essential crops will be eliminated to conserve the supply for fruits and other food crops. It is expected that most of the straight nitrogen fertilizer available will be sulphate of ammonia and possibly some nitrate of soda.

On the whole, the situation looks quite favorable for fruit growers in Kentucky.

## SOME 1942 STRAWBERRY TESTS

### I. Lexington Results

C. S. WALTMAN

During the season of 1942 eight varieties of strawberries were fruited on the Experiment Station farm at Lexington. Five of these were comparatively new varieties which have not been grown in this vicinity previously, while the other three, Premier, Blakemore and Catskill, are considered as standard varieties. The yields in 24-quart crates per acre were as follows:

Catskill .....	342.8
Blakemore .....	305.5
Tennessee Shipper (148) .....	298.7
Premier .....	293.8
Dresden .....	289.7
Tennessee Beauty (263) .....	272.3
Tennessee Supreme (260) .....	249.6
Culver .....	207.7



As Catskill was outstanding in production, and has been for the past six years, this variety is evidently a good one to supply near-by markets. It is not an exceptionally good plant producer, but in an average season will form as many, if not more plants, than Premier. Because of the way the plant grows, it is recommended that on good rich soils the planting distance be not more than two feet between plants, in rows four feet apart. On soils not so rich a somewhat closer planting distance would be preferable. The fruits are exceptionally large and attractive in color but not uniform in shape and are a little too soft for long-distance shipment. The quality is not high but good, and ripening is four or five days later than Premier.

**PREMIER** and **BLAKEMORE** continue as outstanding varieties for this area. They can be depended upon to produce satisfactory yields of good quality fruit, and Blakemore is favored as a berry particularly suited for storing in frozen-food lockers. There is an outstanding difference in the plant-forming ability of these two varieties. Blakemore is very vigorous and under suitable conditions is likely to form too many plants. In tests covering four years, best results were secured when the plants were set no closer than three feet in rows four feet apart. In contrast, Premier is generally lacking in vigor and plant-forming ability. Best results with this variety were obtained when the plants were set at eighteen or twenty inches in rows four feet apart.

Dresden in its first tests in Central Kentucky was somewhat disappointing. While the yields were very good and the individual plants very fruitful, the berries ripened unevenly and were soft. Its ripen-

ing time is four or five days later than Premier.

Culver was quite satisfactory in plant growth but lower in yields than the other varieties under test. The fruits were of good quality but inclined to average somewhat small. It is not recommended for general planting until further tests have proven its suitability. It ripens approximately at the same time as Dresden and Catskill.

The three varieties which were developed by the Tennessee Experiment Station showed considerable promise and are being carried on in further trials. The fruit of Tennessee Shipper resembles Blakemore in several respects and in tests conducted by the Tennessee Station has been found to possess excellent shipping qualities. The berries average good size throughout the harvesting season and the quality is good.

The fruits of Tennessee Supreme resemble Premier in several respects, but the variety possesses the distinct advantage of being a considerably better plant former than Premier and the individual plants are also more vigorous. The fruits appear exceptionally suitable for the frozen-pack method of preservation, but are only moderately firm and therefore not well suited for shipping. The ripening time is a few days later than Blakemore.

Tennessee Beauty is the most recent of these varieties to be named and introduced. Being of the Aroma season, it is showing a tendency toward heavy production and is being tested further as a prospective later commercial shipping berry.

## II. Western Kentucky Substation Results

W. D. ARMSTRONG  
Variety Tests

The season was favorable for heavy production and unusually

high yields were had over the entire Western Kentucky area.

Yields of the main varieties tested at Princeton are given below in 24-quart crates per acre:

Blakemare .....	287
Tennessee Beauty (263) .....	276
Tennessee Supreme (260) .....	268
Tennessee Shipper (148) .....	240
Maytime .....	140
Fairmore .....	124
Aroma .....	123
Massey .....	107

Both Aroma and Blakemore are of course standard varieties over western Kentucky. These yields are somewhat typical, for Blakemore has usually out yielded Aroma, and has shown more resistance to drouth. Its fruit, however, is generally smaller than that of Aroma.

The above figures reveal comparatively high yields for most of the varieties and show the new Tennessee varieties to be doing very well in comparison with others under similar conditions. It might be added that these new berries developed by the Tennessee Experiment station are the most promising new varieties in the test and they warrant wider commercial trials in the state. The Tennessee Shipper is a variety of the Blakemore season with fruit even firmer and berries slightly larger. This variety is not bothered with "yellows" as is the Blakemore, and if adapted to Kentucky conditions should be a welcome new variety. The Tennessee Beauty is of the Aroma season, but is firmer of fruit, medium to large in size, bright color and attractive in color, and is showing much promise as a berry of the Aroma season. Tennessee Supreme is a dark red, high-quality berry chiefly selected for quick freezing and home use. Though these three

Tennessee varieties are covered by plant patents and are controlled by the University of Tennessee Research Corporation,\* cooperative distribution methods for Kentucky are being worked out.

Maytime is somewhat similar to Tennessee Supreme but did not produce as heavy. Fairmore is a high-quality, firm berry, but is very dark in color and has given evidence of being difficult to grow. Massey, a new berry of the Aroma sason, had very attractive fruit but was low in yield and needs further testing.

#### Mulch Tests

Early and spring mulching trials were run on 9 varieties. The early mulch was applied in mid-December at the rate of 2 tons of baled wheat straw per acre. The spring mulch was applied after picking started. An average increase of 24 crates per acre was obtained in the December mulched plots over the late mulched plots. This increase is highly important since there was a protective snow covering over mulched and non-mulched berries alike during the sub-zero weather in January, 1942. Had it not been for this snow covering, serious damage would have been done to the non-mulched berry plants. Records show, however, that growers in west Kentucky cannot depend on snow for winter protection. Too often it is absent.

#### Methyl Bromide Fumigation

In a fruiting test comparing fumigated and non-fumigated plants of the Blakemore and Aroma varieties, the fumigated Blakemore plants produced as well as the non-fumigated plants. However, with the Aroma variety the fumigation seemed to reduce the yield. More work is needed and is planned with this variety. There were no crown



borers in either treated or non-treated plants and the tests were only to study the effect of fumigation upon the plants, since it has already been demonstrated that fumigation will kill all borers in the plants. (Refer to the crown borer article, by Dr. P. O. Ritcher, in this issue.)

### 1942 SPRAY SERVICE

During 1942 the Fruit Spray Service Program for the state was carried on generally by the use of Spray Letters and Cards to contact fruit growers rather than by the use of Spray Broadcasts. These written notices seemed very popular among the growers, who appreciated having them to refer to from time to time.

The insectary and fact-finding organization was in full operation. Points in the state where spray information was collected and reported were Fulton, Mayfield, Paducah, Princeton, Henderson, Louisville, Lexington, Ludlow, Alexandria and Cold Springs. The cooperators who sent in the reports from the above sections were vital cogs in the program. It was impossible for the Spray Service leader to visit all the sections regularly and these reports helped to present the whole state picture.

### Plans for 1943

Because of travel restrictions, it will be necessary in 1943 to depend more and more upon cooperators over the state for reports from their sections. The same general plan of relaying letters through county agents will be used and no state broadcasts are planned.

### Mailing Lists

Spray service letters and notices are of value only to fruit growers having special insect and disease problems; and those who try to keep up with special seasonal de-

velopments. The regular Experiment Station spray schedules for apples, peaches, grapes and other fruits are designed to supply full information for growers, who have only small plantings and are faced with no serious insect and disease problems. Each county agent and assistant county agent of the state will continue to receive a copy of each spray letter, and in many counties the county agent will serve as the spray-information clearing house.

### BLAKEMORE STRAWBERRY SURVEY

In 1939 plants of two yellows-resistant Blakemore strains were placed with growers for trial; these were a U.S.D.A. strain and the Mc-Umber strain. According to a recent survey of these men (after three fruiting seasons) they all considered the yellows-resistant strains far superior to the old free-yellowing type and growers are strongly urged to demand and accept only yellows-resistant plants when purchasing Blakemore. Some yellows can be expected to show up in any strain of plants; if so, the affected plants should be dug out. This disease is a weakness of this variety and **does not spread to other varieties.**

### HINTS AND OBSERVATIONS

By W. W. MAGILL  
Field Agent in Horticulture

### WILL IT HAPPEN AGAIN?

I ask the commercial strawberry grower—Do you plan to plant your normal berry acreage this spring? Naturally the question of local labor for 1943 flashed to his mind. What would your answer be? Before you answer the question, let us look over the record of prices following World War No. 1—or the history of berry prices of 1917-18-19-20-21. The following prices are taken from one of the Cooperative Berry Associations of Kentucky:

1917—\$2.50	1920—\$5.00
1918— 3.00	1921— 3.70
1919— 5.50	1922— 2.40

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Due to high war prices on corn, wheat, hogs and beef, many growers in the Kentucky, Missouri and Tennessee section neglected their berries for these annual crops, and look where the berry prices went to in 1919 and 1920. I do not claim to be a prophet for what the future holds in store. However, to my way of reasoning, the spring of 1943 is an excellent year to continue planting at least a part of your normal acreage of strawberries. Such berries will be ready for harvest in 1944 and it seems likely good prices can be had.

**HARDY PEACH VARIETY**

The Kentucky July Heath peach scored a "Home Run" this year in a test block for hardy peach varieties at the Vincennes, Indiana, Experimental Farm, according to C. L. Burkholder of the Purdue University Horticulture Department. This peach ripens two weeks ahead of Elberta, is a creamy-white clingstone with a red blush, more hardy

than Belle of Georgia, a heavy bearer, size equal to Elberta and of splendid quality for canning and pickling.

**ORCHARD MICE**

Good apple trees are too valuable now for mouse feed. Bobtail mice (either the pine mouse or the meadow mouse) are reported plentiful this fall. So I suggest you look for the tell-tale runways on top of the soil but under the cover crop. If you find evidence of these rodents, write for our best known control methods. Keep in mind that the Golden Delicious and Grimes Golden trees are their favorite food.

**SPRAYER REPAIR**

A broken down sprayer will not assist in controlling either apple scab or codling moth. You may not be able to get repair parts in April and May. Better be safe instead of sorry! Go over your sprayer at once and order any needed parts to put your outfit in No. 1 condition.