

KENTUCKY FRUIT NOTES

W. D. Armstrong, Horticulturist, Editor

KENTUCKY STATE HORTICULTURAL MEETING

The 87th annual meeting of the Kentucky State Horticultural Society, The College of Agriculture and Home Economics of the University of Kentucky cooperating, was held in Paducah on December 16, 1943. Officers elected to guide the growers during the coming year were Mr. Herman Yopp, Paducah, President, and the three vice presidents, Mr. Fred C. VanHoose of Johnson county, representing eastern Kentucky; Mr. William Fegenbush of Jefferson county, representing central Kentucky; and Dr. D. W. Doran of Graves county representing western Kentucky. Mr. W. W. Magill of Lexington, Kentucky, was re-elected secretary-treasurer.

An interesting and informative program was had covering many important wartime fruit problems. Chief out-of-state speaker was Dr. V. W. Kelley, Extension Horticulturist from Illinois, who brought an inspiring message urging fruit growers to carry out the best known orchard practices, to plant the most productive varieties, to keep new young plantings coming on, and to eliminate old trees of low yielding, poor varieties. Dr. Kelley also pointed out that retail peach purchasers for home consumption preferred mature, tree-ripened fruit and pointed out needed methods in handling these more mature peaches. Professor A. J. Olney reported a fairly healthy condition as far as most orchard supplies are concerned with the exception of baskets and new sprayers. Growers were urged to place orders for spray materials, fertilizers, tools, and spray repairs as early as possible. Mr. William Fegenbush discussed a number of wartime, labor saving practices that would enable fruit growers to do their work more quickly and efficiently. Outstanding

among items mentioned was a large overhead water storage tank, constructed near the orchard of used materials that enabled quick tank filling and the application of more tanks of sprays per day. Mr. Frank Street of Henderson gave a fine discussion of the important work being done by the National Apple Institute and also led a discussion on important peach production problems. Mr. Herman Yopp pointed out some of the important work that is being done and can be done by State Horticultural Societies and pledged his efforts to make the Kentucky society of great service to Kentucky fruit growers. Mr. W. W. Magill also reported on some of the activities of the society as well as reporting a number of the important items brought out in the sectional fruit conference at St. Louis. Dr. P. O. Ritcher discussed the peach insect work of 1943 consisting of curculio control and Oriental fruit moth parasite work, along with the plans for 1944. W. D. Armstrong discussed the codling moth situation and spray service work of 1943 along with the plans for 1944. This work will be continued along present lines with emphasis on greater service and closer contact with growers.

A somewhat similar meeting for fruit growers in northern and central Kentucky is planned on January 27, in connection with the farm and home convention at Lexington, January 25-28.

CENTRAL STATES HORTICULTURAL CONFERENCE, ST. LOUIS, MO., DEC. 13-15

A very important wartime horticultural conference was held at St. Louis on December 13, 14, and 15, sponsored by the American Pomological Society and a number of cen-

**BULLETIN OF THE KENTUCKY AGRICULTURAL EXPERIMENT
STATION, LEXINGTON, KENTUCKY**

tral state horticultural societies. Fruit growers and Experiment Station workers were there from Missouri, Iowa, Kansas, Nebraska, Arkansas, Kentucky, Tennessee, Oklahoma, Louisiana, Mississippi, Illinois, Michigan, Indiana and Ohio as well as authorities from the United States Department of Agriculture and many representatives from nurseries, fruit machinery, insecticide, fungicide, and basket producing companies. There was a serious tone to all the discussions and much information was brought to light on important wartime fruit production problems.

Kentucky fruit growers in attendance were Mr. Frederick Beyer of Paducah who represented Kentucky in the very important codling moth discussion; Mr. Thomas Hamilton of Mayfield, and Mr. and Mrs. William Fegenbush of Buechel, in Jefferson county. Professor A. J. Olney, Head of the Horticulture Department, University of Kentucky, represented Kentucky in the peach variety discussions. Mr. W. W. Magill reported on the important strawberry work being done in Kentucky in variety testing, mulching, and renovation of old patches. This was the feature strawberry discussion of the conference. This Kentucky report on the behavior of the new varieties, Tennessee Shipper and Tennessee Beauty, was enthusiastically received as was the report of the outstanding results obtained in western Kentucky from early winter mulching.

STRAWBERRIES—1943

By W. D. ARMSTRONG

The spring of 1943 was very wet and this condition extended through the strawberry harvest season. In general, most berries were full of water, were soft, rotted badly in the fields, and had very poor carrying quality. This rotting in itself greatly reduced the yields in such varieties as Aroma, Premier, and in Blakemore to a less extent. It was interesting to observe that the Tennessee Shipper and Tennessee Beauty rotted considerably less than most other varieties and this fact is reflected in very high yields compared to some of the older main varieties. The following table gives the yield

in 24-quart crates per acre of second year plots at the Western Kentucky Experiment Substation at Princeton and of first year plots at the main Experiment Station at Lexington:

1943 Strawberry Yields
in Crates Per Acre

Variety	At Princeton (2nd year harvest)	At Lexington (1st year harvest)
Tennessee Shipper....	196	274
Tennessee Beauty.....	257	255
Tennessee Supreme..	257	251
Fairfax	248
Catskill	241
Blakemore	192	130
Aroma	101
Premier	87

It is interesting to note that at Lexington, with first year berries, the three Tennessee varieties, closely followed by Catskill and Fairfax, yielded considerably more than Blakemore and Premier, the two main varieties in that section. It is also interesting to note that at Princeton, in second year plots, that Tennessee Beauty and Tennessee Supreme had unusually high yields for second year harvests, 257 crates each. Tennessee Shipper was slightly ahead of Blakemore, 196 to 192 crates in the same plots, while Aroma was down around the 100 crate mark.

These records would indicate that the new Tennessee berries are firm enough to stand up well under the most trying conditions and that they also have a tendency to bear a heavy crop on their second harvest year. More records in 1944 will be obtained to increase our general knowledge of these promising new varieties in comparison to standard varieties.

STRAWBERRY MULCH

By W. D. ARMSTRONG

Considerable work has been done in Kentucky since 1938 on strawberry mulch study. Records have shown that during most winters low temperatures occur that cause serious injury to strawberry crowns,

roots, and fruit buds. It is generally considered that temperatures of 15° or lower will cause injury in the early winter to unmulched berries; while in mid-winter the plants can stand lower temperatures with less injury. Temperatures of zero to 10° below zero will cause serious injury, as evidenced in 1940.

The recent unusual cold period of mid-December 1943 that tumbled temperatures to near zero all over Kentucky, caused considerable injury to unmulched strawberries. This injury can now be located by digging plants and slicing down through the crowns of the new plants and through their roots close to the crown. If the crowns or roots have brownish, rusty colored areas this indicates cold injury. The roots and crowns of healthy first-year plants are clear and white on the inside; while it is natural for second year and older plants to turn pinkish, or a dark brick-red on the inside.

1944 records will, no doubt, show that growers who mulched their berries before the recent mid-December freeze-up will net a sizeable profit from this work at harvest time.

STRAWBERRY NITROGEN TESTS

Lexington

C. S. WALTMAN

In September 1942, some nitrate fertilizer trials on eleven varieties of strawberries were started. The 1942 growing season had been very favorable and most varieties had made heavy plant growth. Plots were nitrated three different ways: (1) Fall nitrate on September 3; (2) Spring nitrate on May 4; (3) Fall and spring nitrate; (4) No nitrate after setting and no fertilizer before setting. The fertilizer applied was nitrate of soda at the rate of 200 pounds per acre and the plots fertilized in fall and spring got this amount each time. The soil was good productive garden soil that had been grown in a vegetable rotation and had had fertilizer on the previous crops but, as mentioned, none immediately ahead of the strawberries.

For the whole eleven varieties the average yields were as follows in 1943:

No Nitrogen	199 crates per acre
Fall Nitrogen	190 crates per acre
Spring Nitrogen.....	134 crates per acre
Fall and Spring Nitrogen	126 crates per acre

From these figures it is seen that, in general, wherever nitrogen was added the yield was depressed. However, fall nitrogen depressed the yields much less than spring applications or a combination of fall and spring applications. There was some difference between varieties as noted. In practically all cases additional nitrogen reduced the yield on Blakemore and Premier, main varieties. Spring nitrogen was slightly helpful to Starbright and Dresden, two new varieties apparently not adapted to Kentucky. Fall nitrogen was decidedly helpful to Catskill, Fairfax, Tennessee Shipper, Tennessee Beauty, and Gandy. In the spring nitrogen plots there was larger, taller, and greener foliage; maturity was delayed and there were more rotted fruits.

These results are generally in line with previous trials in this state. In several previous tests and observations, it has been noted that after a soil has been built up, by a rotation using general fertilizers and a leguminous cover crop, additional nitrogen often reduces the strawberry yields. However, there are undoubtedly many locations and some varieties where extra nitrogen, especially the fall application, will pay. This problem, therefore, goes back to individual cases and the fact that each grower should study his individual needs and act accordingly.

WHAT'S AHEAD

By A. J. OLNEY

No one can look far into the future but the prospects for the fruit grower at this time are as bright as in any field of agriculture. The orchards of Central Europe have been destroyed through neglect and the ravages of war. Knowledge of the importance of fruit in the diet, as a means of promoting health, has reached a level heretofore unattained. The peoples of the world are becoming fruit conscious. Fruit ex-

ports now top the list of foods sent abroad. In the post-war period, fruits will be shipped from country to country, all over the globe, because of demand, because we have learned how to handle export shipments, and because we will have the ships. No doubt, foreign countries, too, will develop fruit production. Thus, the picture grows. One can envision much change and the need for cooperative effort. We must look beyond present difficulties if we are to be ready for the future.

Recently, there has been a feeling of discouragement among apple growers because the ideal of quality we have striven so hard to build up was not recognized in the price ceiling. Certainly, it was irrational to see Combination, Utility and even Unclassified packs bringing prices at or near that of the best grades. Yet, this is something that can be corrected if grower organizations are strong enough to do something about it. Price ceilings will be in effect for all fruits during the coming year. We must be organized to be represented on the National Councils. The facts regarding production costs must be taken into account if fruit growers receive a fair price for their products. The fruit growers' organization in Kentucky is the State Horticultural Society. The society was active in 1943, along with organizations from other states, and was responsible, to a large degree, for a boost of about one cent a pound on the price the growers received for their apples last year. The strength of the Kentucky State Horticultural Society will depend entirely on the fruit growers, themselves, not only by becoming members and helping to finance the program, but by active participation in a full and free discussion of the problems that face the industry. The interests of strawberry, peach and apple growers are at stake. There is every reason to believe that the welfare of the fruit growers can be protected if the growers take prompt action.

Very soon, many other problems as important as price ceilings will be forced upon us. Will we be organized and ready to meet them? Problems of transportation, marketing and world trade must be met. The future is in the hands of the fruit growers. If they act wisely, the prospects for the fruit industry are bright indeed.

SUPPLIES AND EQUIPMENT

By A. J. OLNEY

With the great need for fruit and the promise of reasonable prices, every effort should be made to provide for necessary supplies and equipment before the time they will be needed.

The situation regarding supplies of fertilizers, spray materials, and equipment for fruit growers is beginning to ease somewhat, according to reports received from the War Food Administration and trade associations. The distribution of these commodities will continue to be controlled in order that they may be available to those that need them. It is emphasized that growers should place their orders with dealers early, so that distributors can include them in making up their allotments.

The manpower situation continues unfavorable all along the line, which means that delays in delivery will be unavoidable, and this is another reason why early ordering is imperative.

The principal nitrogen fertilizer available will be ammonium nitrate. This is a new form of nitrogen fertilizer. When first put out, it was found that this fertilizer soon became wet and then became caked and hard and difficult to handle. Recently, ammonium nitrate has been manufactured in pellet form, which has largely overcome this difficulty. However, it seems best not to plan to store this fertilizer for long periods. Since ammonium nitrate contains approximately twice as much nitrogen as 16% nitrate of soda, only half as much will be needed. Except for the amount required, it should be used the same as other nitrogen fertilizers.

Most spray materials will be available in adequate amounts. Present indications are that there will be as much lead arsenate this year as last, and perhaps more, but this is not certain. It is expected that copper sulfate will be adequate, but supplies will be controlled, and early ordering is important.

The supply of baskets and containers is limited by labor shortage and available materials, but it is hoped that the situation will improve by harvest time. Second-hand containers should be saved and repaired.

Repair parts for most standard

makes of machinery are available. Frequently, an old outfit can be put in good condition if the worn parts are replaced. Although some increase in the amount of new machinery manufactured is promised, the fullest possible use of old equipment is essential.

DORMANT SPRAYS FOR APPLES AND PEACHES

By P. O. RITCHER,
Department of Entomology and
Botany

Now is the time for fruit growers to start thinking about dormant sprays so they can be ready to spray when a good day comes along. Too often the dormant sprays are put off, growth starts and it is too late to spray.

On apples, the dormant spray is mainly for the control of scale. Where there is danger of injury by rosy aphid, materials can be added to the scale spray to kill the aphid eggs. The best dormant spray consists of 3 gallons of orchard spray oil (as tank-mixed emulsion or equivalent of commercial oil emulsion) per 100 gallons of water. To control aphid, add 2 pounds of "DN-Dry Mix" No. 2 or $\frac{3}{4}$ gallons of "Elgetol" or use one of the commercial aphid oils. Other materials for scale control are liquid lime sulfur used at the rate of 11 gallons diluted with water to make 100 gallons of spray.

On peaches, the dormant spray is for the control of San Jose scale and leaf curl. The best spray is tank-mixed oil-bordeaux containing 3 per cent oil in a 4-4-100 bordeaux mixture. Liquid lime sulfur, at the strength suggested for apple spraying, may also be used.

Growers wishing to prepare their own oil emulsions will find their choice of emulsifiers restricted, since both calcium caseinate and soybean flour are unobtainable. One method is to use bordeaux mixture as the emulsifier as in standard practice for preparing the oil-bordeaux peach spray. This is done by starting the agitator with about 25 gallons of water in a 200-gallon sprayer tank and adding 6 pounds of powdered bluestone and 6 pounds of chemical hydrated spray lime. The pump is

started and the discharge from the spray rod allowed to flow back into the tank under full pressure. Next, pour in slowly 6 gallons of spray oil, and pump until thoroughly mixed. Next, add 2 more pounds of bluestone, 2 pounds of hydrated lime and water to make 200 gallons of 4-4-100 bordeaux plus 3 per cent oil. Apply at once.

Dormant sprays should be applied on days warm enough for the spray to dry fairly quickly. Temperatures of 45° F. or above, are preferred. Care should be taken to hit every limb and twig and wet them thoroughly on all sides.

NICOTINE SPRAY SCHEDULES FOR CODLING MOTH CONTROL

By P. O. RITCHER

In recent years the U. S. codling moth laboratory at Vincennes, Indiana, under the leadership of Mr. L. F. Steiner, has developed and perfected several nicotine-bentonite spray schedules for the control of codling moth. These schedules give control equal to that obtained with an intensive lead arsenate spray program, such as that recommended by the Illinois, Indiana and Kentucky Experiment Stations.

Advantages of nicotine over lead arsenate schedules are (1) reduction in codling moth stings, (2) control of leaf hoppers and plant lice, (3) better foliage, (4) larger fruit, and (5) no poisonous residues at harvest. Disadvantages of nicotine over lead arsenate schedules are (1) higher cost, (2) poorer control of curculio and (3) incompatibility with materials necessary for bitter rot control.

Fixed nicotine spray schedules are being used successfully by several western Kentucky apple growers in the Henderson and Paducah areas. They have found that where codling moth was putting them in the "red" they could change to a fixed nicotine schedule and show a good profit on their crops in spite of the higher initial cost.

Two nicotine-bentonite schedules are given in Table 1. Schedule A is for problem orchards with severe codling moth infestations. Schedule B is for orchards with light to mod-

Fixed Nicotine Spray Schedules for 1943

	Calyx and Top-off spray	5, first brood, cover sprays (First 3, 7 days apart; last 2, 10 days apart)	2 to 4 second-brood cover sprays (at 10-14 day intervals)
Schedule A for severe codling moth infestations	Lead arsenate 3 lb. Lime 3 lb. Wettable sulfur 6 lb. Water to make 100 gal.	Mississippi bentonite 8 lb. Mineral oil 2 qts. 40% nicotine sulfate 1 pint Water to make 100 gal.	Mississippi bentonite 5 lb. Mineral oil 2 qts. 40% nicotine sulfate 2/3 pt. Water to make 100 gal.
Schedule B for moderate codling moth infestations	Lead arsenate 3 lb. Lime 3 lb. Wettable sulfur 6 lb. Water to make 100 gal.	Commercial (14%) nicotine bentonite 3 lb. Summer oil 2 qts. Water to make 100 gal.	Commercial (14%) nicotine bentonite 2½ lb. Summer oil 2 qts. Water to make 100 gal.

erate infestations. In both cases, the shift to nicotine is made with the first cover spray which should be completed within 14 days after petal fall. The first second-brood cover spray should be completed by 2 weeks after the fifth first-brood cover spray. In western Kentucky an additional nicotine spray for third-brood worms should be applied late in August. Often this can be combined with the first hormone spray to stop drop.

Every attempt should be made to control scab in the pre-bloom sprays. If a fungicide is needed after petal fall, wettable sulfur can be used in the first fixed-nicotine cover spray provided the mineral oil is omitted in that spray and reduced to 1 quart per 100 gallons in the second cover spray.

If bitter rot shows up (1) remove and destroy all infected fruits and (2) spot-spray with 8-8-100 bordeaux mixture. This will reduce the effectiveness of the nicotine previously applied and if further bordeaux sprays are needed to keep bitter rot in check, it may be necessary to add lead arsenate for protection from codling moth worms.

Two Mississippi bentonites, sold under the trade names of "X110 Filter" and "Panther Creek" have been found by the Vincennes laboratory to work well in the tank-mix formula (schedule A). Neither of these left objectionable residues at harvest if the fruit was brushed. Fruit treated with the sprays called for in schedule B should not need brushing.

DID YOU HAVE BLACK ROT?

(From *Illinois Horticultural News Letter*)

Black rot has appeared in many Illinois apple orchards this year. Dwight Powell of our Division of Plant Pathology analyzes the situation for us:

Comparison of Black Rot and Bitter Rot

Many growers have experienced an alarming amount of black rot on apples this year. Some thought it was bitter rot and became doubly alarmed. Following are some distinguishing characteristics.

1. The black rot fungus always enters the apple through such injuries as codling moth entries or stings, curculio punctures, or calyxes injured by sprays or frost. It is more common around the calyx than in any other area. Bitter rot will infect the apple directly through the uninjured skin.

2. Black rot infection will not change the contour of the fruit; bitter rot lesions are saucer-shaped.

3. Both black rot and bitter rot start from trunk, limb or twig cankers from which spores are produced. Black rot spores infect both fruit and leaves; infection on the leaves is known as frog-eye leaf spot. Bitter rot infects only the fruit.

4. Black rot isn't likely to spread from one apple to another; thus infection generally will appear to be uniform throughout the orchard. Bitter rot spreads from apple to apple

and usually is more serious in limited areas.

Why Black Rot was More Serious in 1943

Reasons for increase in black rot infection probably were: (1) Weather conditions early in the season were especially conducive to fungus growth and arsenical and frost injury. (2) The percentage of fruits injured by insects was high because of the light crop.

Control Measures

There was a general tendency for black rot to be more prevalent in orchards sprayed with a nicotine schedule. Growers experiencing rather serious outbreaks may find it necessary to continue the lead schedule through at least the fourth cover spray in order that Bordeaux may be applied during this period. By using sulfur through the first cover and bordeaux in the second, third and fourth cover sprays, black rot will be substantially controlled. Unless such preventive measures are used, it is likely to develop into another serious disease of the apple.

THE FRUIT FOOD SUPPLY DEPENDS ON THE COMMERCIAL ORCHARDIST

(From *Missouri Horticultural News*, September)

The general farmer no longer is a factor in producing fruit. Insects, blights, and orchard pests have driven the farmer out of fruit growing. The commercial orchard today produces 5/6 of all fruit grown. The trend toward the fruit farm and away from the farm orchard is shown in the following recently-released census figures.

Farmers Abandon 1,041,225 Acres in Fruit.—In the last 10 years more than a million acres in fruit were abandoned by farmers as unprofitable or interfering with other farm work. Here are the census figures:

Acreage in fruit in 1930.....	6,086,176
Acreage in fruit in 1940.....	5,044,951
Loss	1,041,225

Commercial Fruit Farms Replace Lost Acreage.—Millions of farms gave up growing fruit, yet in the last 10 years fruit production has increased steadily. The following production per tree of the farm orchard

as compared with commercial fruit farms tells why:

Production per tree on farms less than 100 trees (Farms)	1.8 bu.
Production per tree on farms of 1,000 trees and over (Fruit Farms)	3.6 bu.
Bearing apple trees in 1930: 88,848,970 yielding	126,433,057 bu.
Bearing apple trees in 1940: 58,152,108 yielding	150,236,768 bu.

An analysis of Fruit Farm income by the Census Bureau reveals that less than 2% of income is received from other source than fruit. 1940 Fruit Farm Income follows:

From Fruit	\$300,975,952
From Livestock	5,311,450
From Dairy	4,946,357
From Poultry	5,018,372
From Vegetables	6,249,077

HINTS AND OBSERVATIONS

By W. W. MAGILL
Field Agent in Horticulture

Systematic Starvation!

Last March the fruit growers of the Paducah District held a field meeting at the Frederick Beyer Orchard. He had sealed the inside of a large old chicken house with phosphate paper bags at a cost of 20 cents worth of tacks, a rainy day's labor, and a 50-cent padlock. In this house he had stored 1,000 field crates. To satisfy the curiosity of a few growers, he unlocked the door, selected a crate at random, and, with the help of some visiting growers, tore the crate apart. We found 67 active over-winter codling moth larvae hibernating in the cracks and crevices. If that was an average crate, there were 67,000 of those little worms sealed in that shed, doomed to certain starvation!

High-Powered Advertising

The fruit and berry growers of the United States received a "million dollars" worth of advertising from the Military Foods Program. If it is necessary for a man in uniform to have some kind of fruit products in his diet, it is equally necessary for the 100 million back home to eat fruit in some form.

Agricultural Experiment
Station
of the
UNIVERSITY OF KENTUCKY
LEXINGTON, KENTUCKY
Thomas Cooper, Director

Penalty for private use to avoid
payment of postage \$300.

**FREE—ANNUAL REPORT OR
BULLETIN OR REPORT
OF PROGRESS**

Wm. Fegenbush of Louisville reported how he had recently erected a large second hand overhead water storage tank in the middle of his orchard, at a cost of \$100. With this quick filling (300 gal. in 4 minutes) and a short haul, he now sprays 4 tanks while he used to spray 3.

What is the cash value of an apple tree that produced a 30-bushel crop of apples in 1943, which sold for \$3 per bushel?

The supply of nursery stock, both apple and peach, is very limited this season. If you have any Blakemore or Aroma strawberry plants for sale, let us know about it at once. The demand seems to exceed the supply.

A \$5,000 Breakdown

Magill: I assume you paid about half the cost of your farm with this 1943 apple crop?

Grower: If I'd had anything to sell I might have. But I had very few apples.

Magill: You don't say! When I visited your orchard back in April you had a fine prospect.

Grower: I had then, yes. But just after you left I had sprayer trouble. A couple of parts were almost worn out and were too weak to stand the pressure. I ordered new parts, but it took almost four weeks to get them, and the scab took my crop. If I'd gone over my outfit in January and ordered the new parts needed, it would have been a different story!

Think It Over!

Tonight, after your day's work is over, get a paper and pencil. Think over, and write down, the five leading reasons why your orchard did not do better in 1943. File this sheet of paper away, where you can find it. During the long evenings in February and early March, spend plenty of time answering, in your own mind, the five points you listed that were responsible for your greatest failure of 1943. Your answers may go a long way toward heading off the same mistakes in 1944.