

KENTUCKY FRUIT NOTES

W. D. Armstrong, Horticulturist, Editor

KENTUCKY FRUIT NOTES— BACK AGAIN!

This is the first issue of the KENTUCKY FRUIT NOTES bulletin under the new Special Horticultural Appropriation which went into effect July 1, 1942. The earlier series of this bulletin, begun in 1938, was discontinued in 1940 because of lack of funds. Since then, a great many requests and suggestions for the renewal of this bulletin have come from interested fruit and berry growers. It is therefore being published again as a quarterly bulletin, a part of the larger horticultural program made possible by the recent appropriation. It is hoped that this will be of value to growers in their war efforts.

It will be the purpose of this bulletin to furnish fruit and berry growers with practical and timely information on insect and disease control, the behavior of new and improved varieties, the results of various cultural tests, and, so far as possible, on economic trends that will be helpful to those growing and selling fruit and berries in Kentucky. Suggestions for improving the effectiveness of the publication will be appreciated. A write-up of your own experiences that might be of value to others will be most welcome.

MAILING LIST BEING REVISED

This issue is being sent to most of those on the old Kentucky Fruit Notes mailing list. However, because of war-time economy, the

mailing list will be completely revised before the next issue in JANUARY.

If you wish to continue to receive the regular issues of this bulletin, you must fill out the enclosed card and mail it at once. No postage is needed. Write your name and address on the card and put it in your mail box now.

Tell your neighbors about this service. They can have their names put on the mailing list by writing to the Kentucky Agricultural Experiment Station, Lexington, Kentucky.

STRAWBERRIES RESPOND TO COVER CROPS AND SUPERPHOSPHATE

JOE HURT, McCracken County
Agent

Strawberries do respond to good soil building practices. This fact was again firmly fixed in the minds of many who saw and heard in 1941 and 1942 about the 13 strawberry demonstration fields in McCracken and adjoining counties. A 64.8 per cent increase in yield, as a reward for proper pre-seasonal land preparation and adequate fertilization, is enough to make even the most skeptical take notice.

Cooperative Tests with 13 Farmers

For many years the University Extension Service and other agricultural workers have insisted on the use of more green manure crops and phosphate as a means of improving the yield and quality of strawberries produced in the Paducah area. It was, therefore, welcome

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news when it was learned in the summer of 1940, that the Illinois Central Railroad Company would finance several demonstrations to fix these facts more firmly in the minds of the producers of berries.

Paul Farlow, who was then Agricultural Field Agent for the Illinois Railroad (since made General Agricultural Agent), Extension Horticulturist W. W. Magill, and the County Agricultural Agents in McCracken, Graves, Ballard and Marshall Counties arranged with 13 progressive farmers in these four counties to conduct demonstrations in turning under green manure crops, and in liming and phosphating, preliminary to setting berries.

These 13 farmers agreed to conduct the demonstrations as outlined and to keep accurate records of production. The Railroad Company agreed to furnish lime; superphosphate; seed for a green manure crop; and good, disease and insect-free strawberry plants. The County Agricultural Agents were to supervise the work and use the demonstrations for the benefit of the strawberry producing public.

Materials were furnished according to the estimated needs of the plots selected. In most cases 2 to 3 tons of lime, and 300 lb. of 20 percent superphosphate was used per acre plot. A green manure crop of soybeans, cowpeas, or some other legume, was turned under in the summer of 1940. In addition, rye, rye grass, crimson clover, vetch or combinations of these were used as winter cover crops the fall prior to berry setting.

Results of the Tests

In most cases, demonstrators used 1 acre for their treated plot and ¼ acre for an untreated check plot. Yields were figured on an acre basis. Because of insects and grubs, two demonstrators failed to com-

plete their projects. The following table shows results:

1942 PRODUCTION RECORD
(Number of 24-quart crates per acre)

Cooperator	Unimproved area	Improved area	Increase in crates per acre
Frank Grief	56	150	94
Leonard			
Overby	72	199	127
Allen Hines	219	325	106
E. S. Melton....	67	127	60
M. E. Lyon	122	146	24
Earl Harris	168	231	63
J. T. Toon	107	140	33
H. J. Roberts....	100	185	85
J. H. Bradford	112	289	177
Renloe			
Rudolph	141	216	75
J. T. Warner....	256	332	76
Total	1420	2340	920

The average expenditure per plot was \$19.50 per acre. The average increase yield was 83.6 crates per acre or, expressed in dollars, \$100.32, when based on 1942 prices of \$1.20 per crate net. Acre increases varied from 24 to 177 crates.

Prizes for excellence of plot care were offered by the I. C. R. R. and local Farm Bureaus. J. H. Bradford, McCracken, won 1st prize; Renloe Rudolph, Marshall, 2nd prize; and H. J. Roberts, Graves, 3rd prize.

The year, 1942, was an exceptionally good strawberry season; yields were generally high. Contrasts with check plot yields give an accurate picture of the value of preparing in advance for the strawberry crop.

SEARCHING FOR HARDY PEACHES

Loss of peach buds from sub-zero weather in Kentucky during the winters of 1929-30 and 1935-36, in January, 1940, and in January, 1942,

emphasizes the need for hardy peach varieties. Much peach breeding work is being done by some state experiment stations, by the U. S. Department of Agriculture, and by some individuals. Trees of the hardiest peach varieties available and of unnamed hardy selections from experimental breeding work have been planted on the grounds of the Western Kentucky Experiment Substation at Princeton, Kentucky; in 1942 most of them bore fruit. A somewhat similar planting has been made at the Experiment Station at Lexington where the crop froze out completely in 1942, and at the Robinson Substation at Quicksand in Breathitt County where some of the hardier varieties fruited this year.

At Princeton, a peach day was held on July 23, when a great many varieties of fruit were ripe. Those in attendance were greatly interested in and highly pleased with the varieties they saw fruiting. All of the varieties represented went through a temperature of 10° below zero, and some of them such as Othelle (July Heath), Ambergem, Colora, Raritan Rose, Oriole, Cumberland, Golden Jubilee, Mamie Ross, Alton, South Haven, Viceroy, Veteran, Summercrest and Georgia Belle showed enough bud hardiness to withstand the extreme cold and bear a crop that had to be heavily thinned. Varieties that lost a higher percentages of fruit buds in the January cold but still came through with a good crop of fruit that required practically no thinning were: Elberta, Halehaven, Vedette, Fair's Beauty, Triogem, Gold Aflame, and Redelberta. A number of other varieties fruited for the first time at that location and showed considerable promise but do not warrant mention at this time. A fuller report of this peach variety test will be published at a later date.

EXPERIMENTS SHOW STRAWBERRY MULCH NEEDED

W. D. ARMSTRONG

From field experiments in the Purchase Area, it is estimated that December mulching saved strawberry growers of the (Purchase) Area more than 80 crates per acre following the 10° below zero weather of January, 1940. The cold killed many blossom buds, reducing the blooms, and caused extensive cold injury to strawberry plant crowns and roots. In contrast, the winter of 1938-39 was mild, winter injury was very minor, and little or no benefit was obtained from mulching.

However, since most winters are severe enough to cause injury to strawberry plants, it would seem that preparation should be made to mulch in December before severe weather comes. These results and conclusions are based on experiments reported in some detail below and should be of special interest to Kentucky strawberry growers.

Purpose and Scope of Experiments

The wide difference in strawberry mulching practices being carried out in Western Kentucky showed a need for mulching facts; so it was decided to carry on some strawberry mulching experiments in that section. This work was started in commercial fields in the Paducah-Benton-Mayfield section and in the Louisville section of Jefferson County in the fall of 1938. Wheat straw mulch was applied to different plots at the rate of 1, 2, and 3 tons per acre and was applied to different plots at three different times, Mid-December, early February, and late March. Other plots, used as checks, had no mulch applied on them at all. These tests were carried on 6 fields through the

winter and spring of 1938-39 and 3 fields in 1939-40. Both Aroma and Blakemore fields were used in Western Kentucky with a Premier field used in Jefferson County. Detailed harvest records were kept during the harvest seasons of 1939 and 1940.

1938-39 Results

Following a very favorable growing season in 1938, one of the mildest open winters on record, and a very favorable fruit development season in 1939, the 1939 harvest records did not show a general increase for the overwinter mulched plots. On the contrary, the plots getting 2 or 3 tons per acre in December, February and March showed a decrease in yield. These heavier mulches held back the ripening season and some of the late ripening fruit was ruined by a hot, rainy period near the close of harvest. Because of favorable weather, no plots suffered for moisture and fruit size on all was acceptable. However, the fruit from the non-mulched plots was earlier, smaller, and dirtier than any other. The over-winter mulch also prevented much plant "spewing and heaving" and much soil loss from erosion. Due to the mild winter in general there was no damaging cold injury to any of the mulched or non-mulched plants.

1939-40 Results

1940 results and weather conditions were entirely different from those the previous year. Growing conditions for new fields were very unfavorable in 1939. A cool, wet, late, spring was followed by a dry, hot summer and fall. January 19, 1940, saw temperatures of 8° to 12° below zero over the entire state. From Beaver Dam on down through western Kentucky there was **no snow on the ground**, but central and northern Kentucky had good snow protection. Following this severe

cold, plants from the non-mulched plots showed severe winter injury as evidenced by internal browning of the crowns and roots. Many of these plants died and many roots also died, and in an effort to save themselves the plants threw out new roots close to the surface. There was some winter injury on all the December mulched plots but not nearly as extensive as on the non-mulched areas.

The 1940 harvest record showed a very remarkable increase in yields due to the December mulchings. December mulching on the first-year Aroma plots gave a yield of 142 crates per acre, which was 80 crates per acre more than the average yield on the February and March mulched plots. The December mulching on the first-year Blakemore gave a yield of 209 crates per acre, which was 86 crates per acre more than the average on the March mulched plots. In each variety, with December mulching there was an increase of only 2 crates per acre in favor of **two tons** of mulch over 1 ton per acre. Where 3 tons of mulch per acre was used, however, the yield was 20 crates per acre more than where 2 tons were used. This indicated that in years having severe cold spells the heavier mulches are very profitable on the fields with thin stands of plants.

Results on the second-year Blakemore plots that had a very thick stand of plants and considerable litter from the previous year's growth failed to show a uniform increase for the heavy over-winter mulches. This verified the often expressed belief that second-year fields generally need less winter mulch protection than first-year fields.

The moisture conditions were so favorable in the growing and fruiting season of 1940 that there was little difference in size of fruit on

the light, heavy and unmulched plots of first-year Aroma and Blakemore varieties, but the heavy mulching helped the size of the fruit considerably in the second-year Blakemore plots.

Effect of Mulch on Blossoming, 1940

Soon after growth started in 1940 it was evident that a great many plants in the unmulched or late-mulched plots and in spring-mulched open fields were not going to blossom. This condition was chiefly noticeable in the Aroma variety and was general over the Paducah-Benton-Mayfield district. When this condition had previously occurred in seasons following cold winters (such as 1936) it had not been associated with weather of the previous winter. The non-bearing plants had been locally referred to as "he plant", and the variety had been accused of "running out". Thus it was shown by observations and records in 1940 that it was winter killing of fruit buds that caused so many non-bearing plants of all sizes and location in the row in late-mulched Aroma fields, following severe winters. Many of these plants, relieved of fruit production, made an extra vigorous growth and started an early and heavy runner formation.

As a result of the observations, extensive counts were made of fruiting and non-fruiting plants in the various plots. These counts showed that in first-year Aroma plots, mulched in December, 68 percent of plants blossomed and bore fruit while in the Aroma plots mulched in February and March only 37 percent of the plants bloomed and produced fruit. In the first-year Blakemore plots mulched in December, 86 percent of the plants bloomed and bore fruit while in the Blakemore plots mulched in February and March only 65 per-

cent of the plants blossomed and bore fruit. Thus in both early-mulched and late-mulched plots a considerably higher percentage of Blakemore plants than of Aroma plants bloomed and produced fruit. This indicated more severe winter injury to Aroma than to Blakemore.

Effect of Mulch on Weed Growth

In general, any mulch retarded weed growth, and the heavier the mulch the less the weed growth. Fall or early winter mulching often resulted in a thick growth volunteer wheat when chaffy or poorly threshed wheat straw was used. **This is one of the problems with fall mulching.** Clean straw should always be used. In addition, straw for fall use should be hauled to the field in September or October and allowed to be wet by the fall rains so that any weed and wheat seed will germinate before it is spread.

Discussion

In the season following the warm and open winter of 1938-39, lower yields on the plots receiving the heavy (2-ton and 3-ton) December mulching than on the unmulched plots would indicate that this mulch over the plants during the warm open winter held back the development of the plants and was actually harmful to them. The very great benefit, however, that came from December mulching in 1940 shows that fall mulching is very beneficial in abnormally cold winters. Also, the fact that we have had severe sub-zero weather during the winters of 1929-30, 1935-36, 1939-40, 1941-42 indicates that during most winters we can expect weather cold enough to do severe damage to unmulched strawberry plants. It does seem, however, that considerable judgment should be used in making the first application in the fall. If the straw is distributed in small piles, or

in bales, in the field it is then a fairly easy task to spread this mulch whenever it seems likely that temperatures will fall as low as 15° above zero. About 2 tons of mulch per acre seems to be the amount needed for the Paducah section; and about 3 tons per acre seems to be a good application in the Louisville and Cincinnati sections. One ton of straw per acre offers very little protection to plants or to the picking middles and is generally considered too light an application. Even when not needed for cold protection, an overwintering mulch usually pays good dividends in preventing erosion, in catching and holding snow, and in saving moisture.

While snow makes excellent protection to strawberry plants during sub-zero weather, snow cannot be counted on to be present in Western Kentucky all during the winter. If it had not been for the protective covering of snow in January, 1942, the unmulched strawberry fields in western Kentucky would have suffered severely from the sub-zero weather. From the evidence gathered to date, it seems a wise plan for Western Kentucky strawberry growers to mulch their fields in early winter, rather than to hope for snow protection. Additional mulching trials are planned for the coming two years by the Special Horticultural Program.

ORIENTAL MOTH CONTROL WITH PARASITES

P. O. RITCHER

Dept. of Entomology and Botany

One of the most effective ways of controlling the Oriental Moth of peaches is by insect parasites. The most promising of these is a small, yellow-brown wasp called *Macrocentrus ancylivorus*. It is native to certain parts of the United States but not to Kentucky.

How the Parasite Works

This insect flies about the peach orchard hunting for twigs containing Oriental Moth worms. When it finds them, it thrusts an egg into the body of each worm. One wasp may attack 500 or more worms. The eggs hatch wasp larvae which devour the Oriental Moth larvae. These parasites multiply very rapidly and are especially helpful to the farmer since they kill the early broods of Oriental worms which work in the tender twigs but not in the fruit.

Results from First Introduction

Beginning in 1929, through the combined efforts of the federal Oriental Moth laboratory at Moorestown, New Jersey, the Experiment Station and Frank Street of Henderson, a great many of these parasites were released in Kentucky orchards. Surveys made in recent years, however, showed that *Macrocentrus ancylivorus* had established itself only in the Henderson area, where it was found in most of the peach orchards. In some orchards, by actual count, the parasite had destroyed over 80 percent of the Oriental Moth worms by the first week in June. Its method of control is better than spraying for it doesn't cost the grower a penny after the parasites are introduced and well established.

New Introductions Made

In order that other peach growing sections might benefit from this enemy of the Oriental Moth, Armstrong, Magill and the writer, as a part of the work under the Special Horticulture Appropriation, made in June and July of this year a number of visits to Henderson orchards known to contain *Macrocentrus ancylivorus*. They collected over 3,000 peach twigs containing parasitized Oriental Moth larvae. They placed 2,922 of these twigs in suit-

able release cages and distributed them in 12 peach orchards, 200 to 300 to the orchard. These orchards were mainly in the Purchase section of Western Kentucky, where this parasite had not been previously established. In making the releases, orchards with a heavy Oriental Moth infestation adjacent to strawberry patches were selected. The presence of the strawberries was necessary since, in this latitude, the parasite needs to overwinter in larvae of the strawberry leaf roller. The remainder of the collected twigs were taken to the Experiment Station in Lexington to make records of the actual parasitism.

At the present time it is too early to say how successful were these liberation attempts. It is known that the liberated twigs did contain many fruit moth parasites. In the orchards where liberations were made over 1,000 infested twigs were collected to check on the experiment. Collections of infested twigs will be made again next year in these orchards. The parasites will then be matured in the laboratory to see how many wasps are present in the new locations. Additional transfers of parasite infested material are planned for 1943.

HINTS AND OBSERVATIONS

By W. W. MAGILL
Field Agent in Horticulture

ATTENTION: STRAWBERRY GROWERS

How much superphosphate can you profitably use on strawberries? How many Kentucky growers can answer this question concerning their own farm? The production table in an article written by Joe Hurt, and appearing in this publication, is worthy of careful study, if you are growing strawberries in Kentucky. The men listed are all good berry growers, to be sure, and their yield is far above

the average, but take a second look at these production figures. Their "increased yield" due to superphosphate and cover crops is outstanding. These fertilizers do not stimulate vine growth but cause larger, well developed berries that present an attractive appearance and ship well.

SCALE NOTICE

San Jose scale has increased rapidly in many Kentucky orchards this year. In some cases this has come about because the dormat spray has been left off for one or two seasons; in other cases to poor spraying; and in all cases to favorable weather for scale development. With favorable prices in prospect it would be bad economy to let scale reduce the producing power of your trees. Each grower is advised to put on during the winter or early spring, a very thorough dormant spray of 2 to 3 percent oil emulsion, unless he is sure he has no scale.

GRAPE CROP SAVED BY SPRAYING

Three years ago, Joe Bray and Sons of Trimble County, threatened to pull up their vineyard because they had lost two successive crops from Black Rot. After it was suggested that they make a more thorough and timely use of Bordeaux mixture, they tried it and in 1942 controlled Black Rot almost 100 percent. They increased the dosage from one quart to a half gallon per vine at each spray. Black Rot has been unusually destructive to grapes in the entire Louisville area this season, but the Brays and some others, knowing the effectiveness of adequate spraying, have kept the disease under control.

"QUALITY-PLUS APPLES"

Here are a few "hot shots" from Mr. Ronald Harris of Johnson County. During each of the last 10 years he has produced not less than

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1,000 bushels of high-class apples on his 92 bearing trees. This year his crop will be about 1,500 bushels and it is "Quality-Plus" fruit that will grade 95 percent U. S. No. 1. Mr. Harris' main varieties are Red Delicious, Rome, and Black Ben Davis, and he has another 4-year-old planting of these coming along.

Mr. Harris was inspired to grow better fruit through visits in former years to the Mountain substation fair at Quicksand. By better spraying and use of nitrogen fertilizer he has since won many blue ribbons at this fair.

At an Extension field meeting held at his place on August 18, Mr. Harris stressed the following points that are worth passing along.

1. He expects to sell enough apples from one tree to buy more corn than he can raise on $\frac{1}{2}$ acre of land.
2. It takes pretty good land to produce heavy annual crops of apples.
3. Nitrogen fertilizer is necessary.

4. The dilute Bordeaux spray (1-3-50) in full bloom prevented blight in 1942.

5. It really was a pleasure to spray with a gun backed with a 400-pound pressure.

6. He plans to hold several bushels of his crop in his basement storage and sell on Christmas market, for quality apples always bring a fancy price at the holiday season.

THE PADUCAH APPLE

The Paducah apple, originated by the late Squire Anderson of McCracken County, continues to gain in popularity.

A fine crop was harvested at the Experiment Station at Lexington on August 24; and ranked with the 3 best in this 28-year old test orchard containing more than 60 varieties. It has not missed a crop in 20 years. The Paducah blooms late and is self-sterile, but the Rome is a satisfactory pollinizer. The Paducah variety was officially recognized by the American Pomological Society several years ago.