Vol. 1 SEPTEMBER 1938 No. 2

KENTUCKY FRUIT NOTES

THE BULLETIN

This is the second issue of the Kentucky Fruit Notes. The first issue came out about August 10. We have had several comments on this first effort and will welcome the reactions of other readers. We are trying to present material that will be useful to growers in the various lines of fruit work.

This bulletin will contain some articles that are only of present interest. Some of the material will be of lasting interest however and will be of as much value in a year or more as they are at present. Such articles are the "Crown Borer Control of Strawberries" in the last issue and "Some Interesting Facts Concerning San Jose Scale" and the report on "Spacing of Aroma Strawberry Plants" in this issue. It is strongly suggested that a place be provided to file these bulletins away for future reference after they are read. Should this be started now many can have a complete set, adding each issue as it comes out.

Soon after the first issue was sent out a number of them were returned to us by the post office department because the party addressed had moved from his old address. The mailing list is being worked over, and those who requested to be added to it are being added. A number of requests for the first issue have also come in.

Any grower who wishes to have his name on the mailing list should write the Experiment Station, Lexington, Kentucky, to that effect or fill out and return the request blank in the back of this issue or turn their names in to their County Agent.

W. D. Armstrong, *Editor,*
Horticulturist, Kentucky
Experiment Station

INSECTARY INSPECTION

During the last month the insectaries at Louisville, Henderson and Paducah have been visited and inspected.

Preliminary plans have been made with the Entomology Department and work started in the way of tree banding to catch overwintering codling moth larvae to study their emergence in the spring. It is hoped that a well equippd, smooth operating spray service can be developed for growers benefits.

CROWN BORER WORK

Collections of adults of the Strawberry Crown Borer for overwintering studies have been made in cooperation with the Entomology Department. This material will enable predictions to be made next spring as to the time of egg laying of this harmful insect.

SEPTEMBER FERTILIZING FOR STRAWBERRIES

W. W. Magill, *Field Agent in Horticulture*

The application of one hundred pounds per acre of nitrate of soda or sulfate of ammonia during late August or the first half of September has become a standard recommendation and practice in many sections of Tennessee and other strawberry-producing states. This treatment is especially desirable and profitable where the previous treatment of the soil in advance of strawberries has not included the turning under of a green legume crop like beans, peas or lespedeza.

The principal back of such a treatment is as follows: The many runner plants have taken root during July and August and will develop crowns for the production of berries the following season. Detail experiments carried on by Shumaker at the Ohio Experiment Station bring out the fact that during late August, September and October the strawberry crowns develop and determine through nature the number of bloom stalks, for producing a heavy yield of berries. This fruit bud development might be compared to that which takes place on the apple tree during May and early June at which time the fruit bud is

developing the crop of fruit for the following year.

A number of demonstrations indicate that any soil which is deficient in nitrogen will give increased yields of strawberries the year following the application of nitrogen. On one crop in Marshall County in the 1938 harvesting season, the grower had two good pickings of berris on the nitrogen row after the rest of the patch was abandoned. Similar results were obtained in two other counties. In no case under observation has the yield been decreased and a careful check up of the demonstrations conducted shows that the shipping quality of the berry is not injured by this fall application of nitrogen.

The nitrate of soda or the sulfate of ammonia is broadcast on the matted row when the plants are dry and the additional precaution is taken of brushing the plants to keep the small particles of this fertilizer from lodging in the crowns of the plants; for burning would be expected if either of these fertilizers remains on the plant. This brushing may be done with an old broom, a bunch of green brush or tall weeds or, if a large patch of berries is treated, a satisfactory brush may be made by fastening about three thickness of burlap bags to a 1"x4"x12' gate slat and dragging this device over the patch with a mule.

I would like to appeal to the large number of growers of strawberries in Kentucky to at least give this fertilizer treatment a demonstration trial. Tennessee reports an average of more than twenty-five crates per acre with the increase in yield on some fields running as high as seventy-five crates per acre where there is a natural shortage of nitrogen. For a small demonstration trial apply three and one-half pounds of this fertilizer to one row a hundred steps long.

SPACING OF AROMA STRAWBERRY PLANTS

Research work by the United States Department of Agriculture and various states have shown considerable gain in strawberry yields as a result of spacing the new plants in the row during the growing season. This is the first report dealing with the Aroma variety since the previous work was done with other varieties.

METHODS.—In 1937 four demonstrations were lined up in four patches. The study was to compare the yields of rows that were allowed to grow and mat up naturally with the yields of rows that had some spacing work done on the new plants. The matted rows were cultivated the usual way and allowed to develop as many new plants as they would. The spaced rows were not given the usual cultivations near the rows that tend to brush the runners close into the row. Instead, the runners were allowed to spread and fan out normally. This gave a greater spread between the new plants as they were formed. A small amount of spacing the runner plants was done during the early hoeings.

After the rows had filled with large, early formed plants and were as wide as desired a cutting device was placed on the cultivator to cut off, in cultivation, any new runners that tried to root in the middles. Using a hay rake or spike tooth harrow, one or two rakings were given across the rows in September and October. These rakings tore out the late formed new plants by catching in runners and dragging them towards the middles where they were cut off with a rolling cutter or otherwise removed from the row. This removal of the small late plants gave more space for the earlier, larger plants to develop heavier crowns.

RESULTS.—The berries in the spaced rows were earlier, larger and of better color. There were more leaves per plant on the spaced rows than on the matted row plants. In yields, one patch showed a slight decrease due to the spacings. The other three patches gave an increase of two, forty-five and seventy crates of berries per acre due to the spacing practice. The four tests gave an average yield of 132 crates per acre for the matted rows against an average yield of 157 crates per acre for the spaced rows.

This is only one year's results in Indiana. This practice deserves more trial over a period of years of varying amounts of rainfall and various soil conditions.

—Condensed from a paper by Monroe McCown, Purdue University, appearing in Hoosier Horticulture.

NOTE.—It would be of interest for a number of our Kentucky growers to try some of this spacing this fall as far as the raking and harrowing work goes. These rows should be compared with untreated rows as to yield, size and color of berry and earliness.

EDITOR

McCRACKEN COUNTY GROWERS ASSOCIATION

This association of strawberry growers is very much interested in the work to be carried on under the horticultural appropriation. Through this act it makes it possible for the Experiment Station to enlarge their facilities for carrying out laboratory and field experiments which should prove very profitable to all Kentucky strawberry and fruit growers in controlling diseases and insects and increasing yields.

We appreciate the value of quality fruit, and our observation has been that the best qaulity has been harvested from thrifty high yielding fields. High yields not only prove more profitable for the grower but at the same time keep him a satisfied fruit grower.

E. S. Barger, *Secretary*,
Paducah, Kentucky

SUMMER FRUIT MEETING OF CENTRAL KENTUCKY GROWERS

On August 11, a very interesting Horticultural field day was held at the orchards of Mr. Joe Bray and Sons near Bedford in Trimble County. This orchard is some thirty-eight miles above Louisville on the Cincinnati road. Some forty fruit growers and orchard enthusiasts from the Louisville district, central Kentucky and as far west as Sturgis, were in attendance. The tour was under the direction of W. W. Magill, Extension Horticulturist. Those present had the opportunity of inspecting and going over this well-managed diversified fruit farm. The fruits being successfully grown and marketed at their own roadside market are strawberries, red raspberries, grapes, peaches, apples and pears.

The Elberta peach harvest had been finished the day before the meeting and a good crop of Late Elbertas was to be ready about ten days later. In examining the Elberta trees he had harvested and the Late Elberta trees that had not been harvested it was practically impossible to find any fruit infected with brown rot. This particular fact was of much interest because this has been a serious brown rot season and many orchards suffered heavy losses from this disease.

A Heavy Loaded Orchard

The Bray apple orchard was next inspected. This orchard is sixteen to twenty years of age and is composed largely of Red Delicious inter-planted with Golden Delicious, Stayman and a variety called Missing Link. The whole orchard is carrying a full crop of fruit which was unusually free from scab infected and wormy apples and is probably the heaviest crop of Red Delicious apples in the state. This orchard, however, has had a record of heavy bearing on these Red Delicious trees from year to year and it is interpreted by Mr. Bray and Horticultural workers to be the result of the ample pollen provided by the variety referred to as Missing Link. This variety is an extremely heavy annual bloomer that produces an abundance of pollen. This fact together with an abundance of wild bees in the surrounding woodland combines to furnish adequate pollination for these Delicious trees which absolutely require abundant cross pollination in order to set a heavy crop of fruit. This orchard is also located on a high ridge that affords excellent air drainage.

The well constructed farm apple storage attracted much attention along with the grading and sizing machinery. After the tour of the orchard was made, generous portions of grape juice, cookies and watermelon helped those present to forget the distance they had walked.

Live stock and general crops were also a part of this farm program and at the roadside fruit market a quantity of watermelons and truck, such as corn and tomatoes, were sold.

This well balanced program along with his fine family and a splendid public spirited attitude combined to win for Mr. Bray a Master Farmer award a few years ago.

This meeting was an inspiration to all present and each one expressed a great deal of satisfaction at having been present and profited from the observations that they made. The practice of visiting other farmers and fruit growers is strongly suggested as a method by which a great deal of information can be gathered.

THE STATE FAIR FRUIT EXHIBIT

M. Y. Nunn, *Superintendent*,
State Fair Horticultural Exhibit

A number of growers have given their assurance that they would have a fruit entry in several of the classes at the state fair fruit exhibit at the Kentucky State Fair which will be

held at Louisville, from September 12 through September 17.

The time of year that the fair is held limits the fruit lists to those that ripen about that time or to fruits that can be stored until fair time. This means that the apple is the most widely displayed fruit at the fairs. There are, however, usually nice displays of pears, peaches, grapes and plums also.

The fruit crop being light this year will mean that it is more difficult to make an exhibit. A first prize will mean more on such a year for it will not only show that the grower had a location that bore fruit this year but will show that he cared for it well and carefully prepared it for exhibit. Growers can get details of the classes and groups from their county agents if they have not received one of the fair premium lists.

We are urging those who have fruit this season to make an exhibit at the fair as far as possible not only to make the fruit department more attractive but to make the competition keener. After the judging has been done identification tags will be placed on the larger exhibits so that visitors can see where they were produced.

THE KENTUCKY PEACH SEASON IN 1938

The peach growers this year had a slow start. After the freeze of April 9-10-11 most growers gave up hope. When it was discovered that all the fruit was not killed in some orchards, they came to life in a hurry and started taking care of the crop. Many growers dehorned their peach trees to renew the tops after it was found their crop of fruit had been destroyed. One grower had started dehorning his trees to renew the top, but close examination by several fruit men revealed many live peaches. A conference was held and the dehorning was called off. Some 4,000 field crates of fruit were harvested from this orchard as a result. A crop worth saving!

Ripening Season Early

The blooming season and ripening season were some two weeks earlier than normal. This early ripening of the fruit caught many housewives off their guard. In many cases all the local fruit was gone before the women began calling for it. This was all wrong, for as they said,—"I have always canned my peaches in August and here they are already gone."

Markets Good

Some nice fruit was shipped from the Bowling Green, Paducah, Henderson, Morganfield and Louisville sections. These sections shipped approximately 100 cars of peaches. The Elberta season opened in the Southern part of the state July 18. Most of the fruit was off in the Northern part by August 12. Most of the shipments in 1938 went out by truck.

The season this year came on in such a way that the peaches to the south of Kentucky were largely gone and the ones to the north, in Illinois and Indiana, had not started moving when the Kentucky fruit ripened, and a very fine market was enjoyed. Practically all the No. 1 fruit brought from $1.65 to as high as $2.40 per bushel at the packing house. The McCracken County Peach Growers Association used the services of a government inspector and were so pleased with the services he performed that they have requested like inspection for 1939. This money was most welcome to the growers, especially since there is a light apple crop generally. This condition coupled with past experience is causing quite a few growers to think in terms of setting more peaches. There are a number of one, two and three year peach plantings now, and several growers are planning to set considerable additional trees this fall. Most acreage is being set to the Elberta variety.

Elevation in Orchards

This season was another test year as far as peach tree locations are concerned. Entire orchards and whole sections lost their crop from the late freeze—an example, the Princeton section. Here orchards on high and low land lost their fruit alike. In other sections near Bowling Green, Mayfield, Paducah, Henderson, and Louisville the orchards on the higher elevations came through with the best crop. In orchards that had hills and dips, the frost line could often be determined on the hillside, below which the trees had no fruit and above which they carried a nice crop.

Those who have seen this happen in other years and have learned the value of location are putting their new trees on the higher levels and leaving the bottoms and low places for general crops.

Insects and Diseases

This was also a year when most peach insects and diseases gave a

great deal of trouble. Probably the greatest loss of fruit was caused by Brown Rot. Serious defoliation and marking of fruit was also caused by late attacks of Bacterium Pruni. San Jose scale is on the increase in the state again, we are sorry to report. There is other space in this issue devoted to San Jose scale discussion. Peach Leaf Curl, the Plum Curculio and the Oriental Fruit Moth were all troublesome in some quarters.

It is practically impossible to predict what the insect or disease damage will be in a given year. The best policy is to always be prepared in as far as possible.

SOME INTERESTING FACTS CONCERNING SAN JOSE SCALE

The original home of the San Jose scale was probably China. It appears to have reached California about 1870 and since then has spread practically all over this country. (Entering Kentucky about 1907.) It has a wide range of food plants, on many of which it thrives sufficiently to quickly kill them. The plants which suffer most from its attacks are the fruit trees and currants, the dogwoods, thorns, poplars, ornamental cherries, flowering quince, plums, hardy roses, willows, lilacs, and lindens; and even maples and elms are sometimes attacked. It feeds on all parts of the plant above the ground even including the fruit.

The full-grown scale is about the size of a pin head, nearly circular in outline and rather flat, sloping gradually upward from its edge to near the center where a slight circular depression surrounds the raised center or "nipple" itself. When adult the scale is of a uniform grayish-brown color. At the beginning of the winter season specimens of practically all ages occur, but probably those from about one-third to one-half or two-thirds grown survive the winter. In the spring these individuals resume their feeding on the sap. Mating occurs quite early, about a month after which the females give birth to living young. These young are produced a few every day or two; and the parent lives for a month or more, producing an average total of about four hundred young. These small crawlers are lemon yellow in color and are about the size of a pin point. They crawl about and locate a suitable place on stem, leaf, or fruit, insert their beaks into the bark or covering and begin feeding. The secretions from its body along with the molted skins which are cast off as it grows form its shell-like covering. Here the females remain for the remainder of their lives. The young become adult in a little over a month and then themselves begin to produce young, and in the northern states there are usually at least three generations in a season while in the South there are four or even more. The generations overlap, the earliest young produced by the second generations for example sometimes appear before the last born of the preceding one, which results in an almost constant presence of crawling young on an infested tree. This condition goes on from the time the first young appear in the spring until reproduction is stopped by cold weather.

Based on four full generations and assuming that the young are equally divided between sexes and that all of the increase should live, it is estimated that over three billion (3,000,000,000) scale insects would be produced from a single pair, in one season. Fortunately many never reach maturity, or an infected tree would often be sucked dry before winter.

—Abstract from Fernald's "Applied Entomology"

From the above statement the reader can understand what a problem it is to control scale where food plants are as plentiful and climatic conditions as congenial as they appear to be over this and adjoining states.

SOME SCALE DISCUSSION

The importance of San Jose scale control cannot be over emphasized to those who desire to stay in the fruit business. Several peach orchards have recently been observed where scale is rapidly increasing. One particular orchard was heavily infested with scale in 1937. A heavy crop of fruit was harvested that summer yet between harvest time and the spring season scale killed the whole orchard so completely that the trees did not sprout out and the orchard was dead by the spring of 1938. This was a perfect score for the scale.

There is considerable demand among fruit growers for a summer spray to check the damage that will be done to their trees before they can apply the regular dormant spray. The use of the so-called summer-oil spray offers probably the greatest possibility. The use of two per cent summer-oil on peach trees is generally considered

safe. However, in a brown-rot year as this one is, it is not safe to follow sulfur sprays or dusts too closely with oil. This will cause foliage injury. It is generally considered safe to apply summer-oil sprays two to three weeks after the last sulfur has been applied. This would not apply to orchards that had no crop in 1938, for of course they have not been sprayed for brown rot. A few test sprays have been applied at the urgent request of several growers. These will be reported on in the October issue. Growers who are interested in getting these results before that time can write to W. D. Armstrong, Horticulturist, Western Kentucky Experiment Substation, Princeton.

Let it be clearly understood that no attempt is being made to substitute summer spraying for regular dormant scale spray. This work is simply to try to help the grower who has gotten into trouble and finds the scale spreading and damaging his trees at present.

PEACH TREE BORER AND ITS CONTROL

P. O. Ritcher,
Department of Entomology and Botany

Introduction.—The peach tree borer is a native Kentucky insect which has been a pest in our state for many years. It attacks trees of every age and is so thick in many peach orchards that most of the trees are attacked within a year or so after planting. Since the best time for getting rid of this insect is almost here, I have been asked to write about the habits of the peach borer and how to kill it.

Injury.—The injurious stage of this insect is the worm or grub which injures peach trees near the ground by tunnelling under the bark and more or less girdling the tree. Young trees are more subject to girdling while older trees are so injured that they become stunted and sickly and their crops are greatly reduced. An infested tree usually has roughened bark near the base and a mixture of jelly-like gum and brown pellets of borer excrement will be found over the wounds in the base of the tree.

Life Cycle.—The peach tree borer goes thru four stages in the course of one year. The first is the egg which is a small, oblong, reddish-brown object. Eggs are laid from July 1 until late in September on the bark or limbs of peach trees, on nearby weeds and trash, or on the ground. These eggs hatch in about 10 days. One parent moth may lay as many as 829 eggs and around 400 is the average.

Young borers, hatch and burrow into the peach bark at or near the base of the tree where they feed and soon reach a considerable size. As many as 90 borers have been found in a single six or seven year old tree but the usual number is from two to ten.

Large borers pass the winter right in their borrows while many smaller ones make winter cells in the bark of the tree. The borers begin feeding again in the spring.

In midsummer, the borers change to the adult state. These are clear-winged moths which fly during the day. They look so much like wasps that they are often taken for them. Egg laying begins soon after mating.

Control.—The best way to get rid of the peach tree borer is by using Paradichlarobenzene; or PDB as it is called.

PDB is a white material which looks much like coarse salt and smells a lot like mothballs. When PDB is placed in the ground, its fumes being heavier than air, saturate the soil and slowly poison the peach tree borers.

Treatment should be made as late in the season as possible but it must be done while the ground temperature is 60°F or above to free the fumes which kill the borers. Injury to the trees may result from application during hot weather. In addition, PDB should be applied when the soil is dry. Peach growers should use this information in deciding when to treat: Apply PDB from the middle to late September, in eastern Kentucky; late September to early October, in central Kentucky; and October, in western Kentucky. Borers can be treated in the spring with fair success but fall is the best time.

Peach trees, six years or older, should receive one ounce of PDB. For four and five year trees and unusually sturdy three year old trees, 3/4 ounces of PDB is correct. Younger trees may not need treatment but if found infested they should be wormed with a knife or wire rather than treated.

For successful treatment, the earth for fifteen to eighteen inches around each trunk should be cleaned of grass and debris and leveled off. If borers are present above the ground level, dirt should be packed around the trunks so the earth is level with the highest borer, excessibe gum and grass should be removed.

The PDB is placed around the tree

in a ring about one or two inches from the trunk and no nearer because of danger of injuring the tree. The PDB can be measured in a small bottle or tin box holding the right amount. After the PDB has been applied, six or seven shovelsful of dirt should be placed around the trunk and packed to form a cone.

With average fall conditions, most of the PDB will evaporate in four to six weeks, killing 90 to 100% of the borers. Cooler weather and too frequent rains hinder evaporation. In any case, it is best to remove the mounds five to six weeks after treatment. Tree injury may occur if mounds are left over winter.

BROWN ROT ON PEACHES—1938

W. W. Magill, *Field Agent in Horticulture*

University of Kentucky

The losses from brown rot in Kentucky peach orchards were unusually heavy this season. In fact, in a number of orchards probably one-third of the crop was destroyed by this fungus. This heavy loss was not due to carelessness on the part of the grower, for in many cases attempts have been made for its control.

Practically every orchard carrying a crop, or even a partial crop, this year was very close to the margin of being destroyed by the freezes and killing frosts of early April. In a number of orchards, only the crop on the highest elevations survived. Even though the frosts or freezes did not destroy the crop, many of the fruits remaining developed split seeds, causing an abnormal growth condition on the peaches, making it possible for the brown rot fungus to enter the peach. At least, in many of the orchards, there were sufficint cracked seeds on most every tree to start the injury from the brown rot.

A number of our growers who have variety orchards more especially suffered from brown rot this year, probably because, from the time Mayflowers began to ripen on through the season for Redbird, Alton, Carman, Belle of Georgia and Champion, the almost continuous rains, at least at week intervals, together with the extreme warm temperatures and high humidity, added to the spread of brown rot.

I have carefully checked the brown rot losses in a number of orchards where commercial dusters were used for brown rot control in place of the spray machines, and apparently the duster program was more efficient than the spraying. In at least two orchards under close observation, the owners report that about two weeks before the Elberta season, at which time such varieties as Belle of Georgia and Champion were ripening, we had approximately four inches rain in three days and nights. During this time the humidity was so high that the foliage of the peach trees would not dry off before noon, and this was followed by rain in the afternoon. In fact, the weather record for the entire month of July showed we had more rain throughout the state than in any year during the last decade. Reports from our terminal markets verify the fact that in many cases peaches which apparently left the orchards in Kentucky and adjoining states in a sound condition, almost immediately developed brown rot in transit and had to be sold at sacrifice prices.

KENTUCKY AGRICULTURAL EXPERIMENT STATION
LEXINGTON, KENTUCKY

I AM receiving Kentucky Fruit Notes, and wish to have my name left on mailing list. .....

I AM NOT receiving Kentucky Fruit Notes, but wish to have my name put on mailing list. .....

This bulletin is to be free of charge.

I am particularly interested in: Berries.....

Apples....., Peaches....., Other Fruits.....

Name.....

Address..... County.....

TRIALS OF BLACK AND PURPLE RASPBERRIES AT THE KENTUCKY EXPERIMENT STATION, LEXINGTON

C. S. Waltman,

University of Kentucky

The interest in new varieties of fruit and their importance in improving the fruit industry makes variety testing an important part of Experiment Station work. Below we report the behavior of some new black and purple raspberries.

1. Dundee.—This variety is one of the more recent introductions from the New York Fruit Testing Association. The plants are vigorous and productive and are said to be moderately resistant to mosaic. However our planting is too young to have proved or disproved this statement. The berries are large, of a bright, glossy color and high in quality. The fruits are not as firm as some other black varieties.

2. Bristol.—This variety appears promising from the results secured this year. The canes are vigorous and fairly productive and the fruits large, firm and of high quality.

3. Sodus.—This is a new purple-cane variety originated at the New York Experiment Station. In vigor it has excelled all other varieties which we have grown. It originated as a cross between the black variety, Dundee, and the red variety, Newburg. It ripened later than our black varieties and the fruits were superior in size. The berries are medium purple in color, fairly acid, high in quality and the plants very productive. In several respects it appears superior to Columbian which is the commonly grown purple-cane variety.

4. Potomac.—This variety yielded exceptionally well this year and the fruits were of good size and high quality. The picking season extended longer than some of the other kinds.

Harvesting Records. — Harvesting started on June 6, on all varieties. The Bristol and Dundee were finished on June 17, while the harvest of the Potomac and Sodus Purple were finished on June 24. The yields on plots of fifty plants each follow: Bristol, 22 pints; Dundee, 56 pints; Potomac, 72 pints; and Sodus Purple, 159 pints. It can be seen that the Sodus variety gave a yield far greater than any other variety tested.

NOTICE OF NURSERY INSPECTION OF STRAWBERRY FIELDS

Word has just been received from Mr. Howard Tilson, State Nursery Inspector, to the effect that he plans to start strawberry patch inspection about September 20. This inspection is only for those growers who desire to sell certified strawberry plants under the Kentucky Nursery Inspection law. The law provides for a $5.00 fee for certification of the fields that pass inspection.

Only those growers desiring to certify their fields for the purpose of selling plants should apply for inspection. The grower's request for inspection should be sent to his county agent as soon as possible.