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KENTUCKY FRUIT NOTES

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Notice.—The June and July issues of this bulletin are being combined. The next regular issue will come out in August.

FRUIT GROWERS AND THE TRIPLE-A

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The Farm Program offers practically every fruit grower in Kentucky an opportunity to solve one of his most pressing problems. The problem we speak of is that which is common to all farmers; the maintenance of soil fertility. The fruit grower in order to improve the quality and increase his yields must maintain and improve the fertility of his soil regardless of whether he grows apples, peaches, or berries. The Farm Program is not designed for the benefit of any particular class or type of farmer. Its purpose is to improve farming conditions in general. The program provides for conservation payments in order to encourage farmers to take better care of their land by seeding legumes, terracing, using green manure crops, and many other soil-building practices. These practices are not foreign to the fruit grower for our better orchardmen have learned long ago that in order to stay in the fruit business they must maintain the fertility of their soils.

All farmers in the program for 1939 have been informed regarding the number of acres of depleting crops that may be grown on the farm in 1939. Payments on special crops such as tobacco and wheat are made to producers planting within their 1939 allotments.

Fruit growers are interested in the manner in which their crops are classified under the program in order that they may plant within their acerage allotments in 1939. First of all the acreage on the farm is divided into two main land uses; cropland and non-cropland. Cropland acreage includes that which is devoted to depleting crops, non-depleting crops and also idle acreage in the regular rotation. The acreage devoted to strawberries is considered as depleting only when the berries are harvested for any purpose except when in a home garden. However, if the strawberries then become destroyed by water, frost, or do not bear for any reason, and are not harvested in 1939, the acreage occupied by the strawberries is then non-depleting. Strawberry growers who have lost their crops this year may substitute an acreage of other depleting crops for their non-bearing strawberries without incurring any deduction for exceeding the general depleting acreage. Any acreage of new strawberries set in the spring of this year will be considered as non-depleting.

Commercial orchards, that is orchards from which most of the production is sold, are considered as occupying non-cropland. Cultivated blackberries, dewberries, raspberries, gooseberries, and vineyards are also considered as occupying non-cropland.

In 1939 a maximum payment which may be earned in connection with soil-building practices is com-

puted for each farm. This payment is available to producers in adition to the amount earned for planting within their special crop allotments. In establishing the maximum soil-building payment, seventy cents is allowed for each acre of cropland on the farm in excess of the acreage allotments of commercial wheat, tobacco, and other special crops. Added to this amount is $2.00 for each acre of commercial orchards on the farm on January 1, 1939. A small allowance is also added for farms with considerable non-crop open pasture. The number of dollars in the maximum soil-building payment is divided by $1.50 to determine the soil-building goal. The goal is expressed in units which it will be necessary to carry out before October 31, 1939, in order to earn the full soil-building payment.

Many soil-building practices which may be carried out on the farm for credit under the program are especially suitable for fruit growers.

Certainly a fruit grower would be interested in the provision which offers him 47% triple superphosphate furnished as a grant of aid. This fertilizer can be made available to the producer if he will call at the county office and indicate his intention of using the material on seedings of grasses or legumes, perennial grasses, winter legumes, crotalaria, annual rye grass, and permanent pasture. Here is an opportunity for the horticulturist to prepare their land later to be devoted to orchards. One hundred pounds of the 47% superphosphate earns one unit credit of the soil-building goal. Superphosphate with a 20% analysis may also be used under the same conditions. One unit is earned for each 240 pounds of 20% phosphate applied.

Many orchardmen prefer to terrace hillsides before setting out their trees. One unit can be earned for each 200 linear feet of standard terrace with proper outlets constructed.

Fruit growers find green manure crops very helpful in building fertility rapidly. One unit is earned for each acre on which a good stand of soybeans or cowpeas is plowed or disked under. Strawberry growers especially have found this practice helpful. Orchard men follow as a good practice a temporary mulch secured by leaving a good stand and a good growth of soybeans, cowpeas, wheat or sweet clover on the land. One unit credit is earned for each acre so handled in a bearing or non-bearing orchard.

A special soil-building practice has been added to the schedule for 1939 especially for orchardists. This practice earns one unit for the application of not less than two tons, air-dry weight, of straw or equivalent material per acre in orchards.

Of course, there are many other practices which earn credit under the program, such as the seeding of grasses and legumes, reseeding depleted pasture, and the use of ground limestone.

TREE CONDITIONING THE PEACH CROP

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Discussion from Illinois Horticultural Society, January, 1938.

When Mr. McMunn and I began the peach thinning investigations in 1927, we had in mind checking a number of the recommendations on thinning which had apeared in the

literature up to that time. As we studied the problem of thinning peaches in detail, however, we found it much more complex than we had anticipated. Instead of limiting our studies to thinning, as such, we brought other cultural practices, such as thinning and nitrate applications, into the picture. In addition to this, we made a long-time study of fruit bud formation and winter injury to the fruit buds. Growth vigor was also found to have a very intimate bearing upon the general problem involved in adjusting the crop to the tree.

Fruit Bud Killing.—One of the first things which always has to be reckoned with in the thinning problem is winter injury to the fruit buds. During the time of these studies, there was only one season—that of 1931—when there was practically no bud killing. There were other seasons when there was a complete kill and still others when enough buds were left for a crop, if conditions were favorable for a set. Late freezes sometimes reduces the crop still further after winter killing had taken its toll of the fruit buds.

It will be seen then that the weather actually gives us the setting for the thinning problem because it determines its extent in the fruit bud survival. Viewed from this angle, thinning can be used one season after another as a means of correcting the distribution of the fruit on the tree or in adjusting it within the proper limits.

The "Natural" Drops.—We are now familiar with the three drops which occur in the peach. These have been given some study in connection with thinning, and they may be defined about as follows: The first drop includes flowers in which the pistil, for one reason or another, has not reached full development. Fertilization is impossible in such flowers and they drop early, usually within two weeks or so after bloom. The next drop is sometimes referred to as the non-pollinated drop and includes those pistils in which fertilization has not taken place. Since these flowers are more vigorous than those which fell at the first drop, they persist until the fifth to the sixth week after bloom. The next drop, the so-called June drop, includes for the most part peaches with embryos partly developed. The second and third drops may overlap somewhat in the time they fall, but the reason for falling is quite different. There has been one year during the time when these studies were under way that a late drop of large peaches was serious in some orchards in the southern part of the state. This drop came on after the June drop and is distinct from it.

The Growth Stages of the Peach.—In order to adequately define the limits of thinning, we have had to give some consideration to the growth stages in the peach. Using Elberta as an example, we may define the (1) first growth period as extending up to the time the pit begins to harden at the point. Following this, there is (2) a period of six weeks or so when there appears to be a retarded enlargement of the fruit in external dimensions, but important interior changes are taking place. (3) The last growth period, terminating in the so-called "final swell," comes on during the end of the season, and it is during this time that the greatest demands are made upon the tree not only as to strength, but also as to food materials and moisture.

Time of Thinning.—With the growth stages in mind then, it will

be seen that there is some necessity for placing the time of effective thinning. Naturally, we would not want to begin thinning before the June drop. On the other hand, our studies show that no treatment or combination of treatments will enable the tree to size up an excessive overload beyond certain fairly definite limits.

Things to be Reckoned With in Thinning.—With this much of an introduction then, we may consider briefly some of the things to be done in the cultural program which will have a bearing upon the size of fruit. One of the first things to be reckoned with is the age of the tree. Young trees are inclined to size up most of the fruit they set because they generally produce an abundance of vigorous leaves. After the first few heavy crops, however, and as the tree begins to reach the larger size of the mid-year, some attention has to be given to regulating growth. This brings both nitrogen and pruning into the picture as supplementing the growth stimulus coming from cultivation. From the measurements we have made, it appears that fertilizer applications and pruning have a comparable stimulus upon the length of growth induced in the top shoots. The growth induced by heavy nitrate applications, combined with heavy pruning, results in a thick top which always matures the fruit late. Wherever the set is heavy, however, the experiments show that the tree cannot size up an excessive load without limiting it, in part at least, by pruning or thinning. Under no conditions is it possible to size up a thickly clustered set.

A number of very interesting things have come out of the thinning investigations. For instance, in the growth studies of the fruit, it was found that the cells ceased to divide after the fruit reached one-half to five-eighths of an inch in diameter, and that enlargement from then on took place as a result of the stretching and enlarging of cells, rather than an increase in their number. With the period of cell division over so early, it is apparent that some increase in size might be expected to follow a reduction in the crop quite late in the season. This point was tested out under the conditions of heavy cropping by leaving the larger fruits on the tree and pulling off the smaller ones, paying less attention to size. It was found that, during the second growth period, it was easy to find some fruits more than twice the volume of others and that, by taking full advantage of the larger fruits on the tree and making the reductions primarily from the smaller ones, yield was not cut materially. In this way thinning can be made effective well up toward the final swell. This kind of thinning seemed to be especially effective with Gage.

The Critical Period.—Things come to a head then at picking time in a rather critical form, and we have some rather difficult things to reckon with which seem to point in opposite directions. For instance, as maturity is approached, quality increases as long as the fruit hangs on the tree. On the other hand, the carrying ability of the fruit drops vary materially as ripening comes on. Growers are tempted to take into consideration a large number of factors at harvest time, and hindsight, unfortunately, is always better than foresight. It is a temptation to pick early while the price may be good and the carrying quality highly satisfactory; at the same time, the fruit is enlarging as long as it hangs on the tree. And we must always reckon with the pos-

sibility of bad weather or unfavorable weather at harvest time. Our studies indicate that a full crop of peaches may build up in volume at the rate of five to ten bushels per acre per day, depending upon the growth conditions at the close of the season. While the volume increases by waiting until the background color changes from a greenish to a yellowish cast, much is also gained from the standpoint of quality. Our tests show too that distant shipments can safely be made with the peach after the ground color assumes a yellowish cast

Fortunately, some of the more recent studies, by Dr. Lloyd and his associates on precooling, point the way out of the difficulties we may encounter by later picking. These studies begin where the thinning investigations leave off. If fruit is left on the tree until the background color takes on a yellowish cast, advantage can be taken to a greater extent of the volume which comes during the final swell, and at the same time fruit of higher quality and of a much more attractive appearance can be put on the market. This is about where we stand on the problem of tree conditioning the fruit. We know enough of the various factors involved to place before the consumer a product which will be much more tempting and which will naturally result in an ever-increasing number of repeat orders.

DISCUSSION FOLLOWING TALK

Question: One point you might bring out in the delayed thinning is that, thinning after the June drop, leaf hoppers and the worm bitten fruits can be removed to a greater extent.

Dr. Dorsey: Keen-eyed thinners can do a lot in picking off the bad fruits and leaving the good ones. Quite often the injured fruits are clustered.

Question: If those trees average about 1,000 peaches, will they mature ahead of a 2,000-peach tree very much?

Dr. Dorsey: If the season is very hot, the overloaded tree will ripen first. At the University this year the Gage variety about ten days before harvest, dropped one-third to one-half of the crop on the unthinned, overloaded trees.

Question: What is the after effect of the overloaded tree as to hardiness?

Dr. Dorsey: The hardiness of the tree and buds is reduced.

Question: We could put more time and money on detailed pruning and a little less on thinning expense, don't you think?

Dr. Dorsey: After the June drop there may be a lot of excess branches, some bearing and some not bearing. Joe Hale and I tried shoot thinning in relation to fruit thinning, and we found that in about four or five minutes, working from the ground, we could cut off a large number of shoots and distribute those left to good advantage.

Question: At what stage was the cutting done?

Dr. Dorsey: About thinning time.

Question: What is the latest date in July that you can thin and still have no decrease in the value of your thinning?

Dr. Dorsey: Thin about three or four weeks after the June drop, and the further you go, the better you can take advantage of the injured and small fruits and at the same time leave the larger ones on more easily.

Question: How about a month before hravest?

Dr. Dorsey: That is still good. The tree has naturally started to make some of the fruits larger and full advantage can be taken of that fact.

Question: The June drop is from May to June?

Dr. Dorsey: It comes about in May in the southern part of the state, six to seven weeks after bloom, and it varies with the set. The heavier the set, the earlier it starts and the heavier the drop.

REVISION OF STATE FAIR PREMIUM LIST

The attention of all the fruit growers who have exhibited in the horticultural department of the Kentucky State Fair is called to certain changes in the premium lists. Other fruit growers who have not exhibited at the State

Fair previously are also invited to read these changes and are encouraged to enter the competition. There are no deep secrets or mysteries or complications connected with fruit exhibits other than hard work. Each grower now exhibiting had to have a first time. There are no entry charges and there is $570.00 of premium money to be divided among those exhibiting. The new catalogues will be off the press in the near future. Those wishing one can receive a copy by writing the Kentucky State Fair, Louisville, Kentucky.

This discussion does not attempt to list all the classes or exhibit sections but is intended to call attention to the changes in order that exhibitors can make their plans accordingly.

These changes were suggested after discussions with Fair officials, judges, a number of exhibitors, and after careful study of State Fair and fruit exhibit premium lists of Kentucky's neighboring and near-by states. It is hoped these changes will be an improvement.

In the apple exhibit, the Yellow Transparent, Wolf River, Arkansas, and Arkansas Black varieties have been removed from plate competition and the Turley variety has been added because of its increasing commercial possibilities for Kentucky. Also, a class is being added for Red Bud Sports of Delicious in the plate class. In the tray class, the Polly Eades is being dropped because it is past its prime at Fair time. Grimes Golden, Paducah, Rome Beauty, Stayman, and Winesap are being added to the single tray class which already includes: Delicious, Golden Delicious, and Jonathan. There are three premiums for each variety of $3.00, $2.00, and $1.00 for first, second, and third. A new class of competition is being offered in single bushel baskets of apples. The varieties listed in this class are Delicious, Golden Delicious, Grimes Golden, Jonathan, Rome Beauty, Stayman, Winesap, and best bushel of any other variety. In each variety there are premiums of $5.00, $3.00, $2.00 for first, second, and third prizes. In judging the bushel basket class, appearance and firmness of pack will be considered. The fruit will be judged on the same basis as in other exhibits. The twenty tray and twenty plate apple class is being strengthened and five premiums of $40.00, $30.00, $20.00, $15.00, and $10.00 are being offered instead of the former premium of $35.00, $20.00, and $15.00.

The large forty tray and forty plate class of apples is being discontinued and in its place an Individual Growers Exhibit is being started. This type of Individual Grower Exhibit has become quite popular at several of the neighboring State Fairs and fruit shows recently. It gives the individual an opportunity to exhibit the different varieties and types of fruit grown on his farm in the different types of containers in which they are marketed as well as in trays and plates. The premiums offered on this exhibit are $35.00, $25.00, $20.00 and $15.00 for first, second, third, and fourth awards. In that this is the first year of this type of exhibit, there will be a number of problems and questions in regard to its preparation. Assistance and suggestions will be available from the Superintendent, Mr. William Fegenbush of Buechel and those assisting with the fruit exhibit.

In addition to the above mentioned changes, there will be a sweepstakes award offered for the best bushel of apples, best tray of

apples, best plate of apples, best plate of grapes, best plate of pears, and best plate of peaches. Each package or entry of fruit in any class will also be eligible for the sweepstakes award in that class.

A part of the grape exhibit has been discontinued. This portion included the three large display crates of twelve containers each. Also, the twenty variety collections. Because of their lack of commercial importance, the following varieties have been discontinued in plate competition: Diamond, Duchess, Pocklington, Lindley, Woodruff, Wyoming, Barry, Herbert, Wilder and Campbell's Early. This reduction still leaves considerable money in the grape premiums. With this fruit, Kentucky still offers more premiums in proportion to the total amount of premium money for all fruits than is offered in any other near-by state. In the peach exhibit, South Haven has been removed because of its earliness and "best plate" of any other variety is being added in its place.

The four quart climax basket classes of Hales and Elbertas have been eliminated and one class of best four quart climax basket of any variety has been substituted. The premiums on pears and miscellaneous fruits have been unchanged with the exception of the withdrawal of quinces.

BROWN ROT CONTROL ON PEACHES WITH HAND DUSTERS

The effectiveness of dust applications in controlling many fruit diseases is generally recognized. For large orchards, expensive dusters are often used to get over the orchard more quickly than can be done with a sprayer.

During the bad brown rot season of 1938, several Kentucky growers reported very satisfactory results of hand type rotary dusters in controlling this disease in small orchards. With a good duster, it is surprising how the dust can be fogged up through the trees and also how fast one can move down a row. Good results with this type of duster have been reported by Mr. Fritz Beyer, Paducah; Mr. John Fegenbush, Buechel; and Mr. L. A. Tapp, Harrodsburg.

The material for use on brown rot of peaches and plums is sulfur dust.

LATE SEASON SPRAYS

By the time this issue of Kentucky Fruit Notes reaches you, many apple growers will have completed their early season sprays and will have stopped spraying for the season. Many good fruit growers work on the plan of doing a very thorough job of the early season sprays and controlling the first brood of codling moth worms with these sprays and then do not spray any for the second brood. If this can be done, it is fine. It is not always possible, however. Then too, there is danger from bitter rot in the late summer and from brown rot on the ripening peaches.

The second brood codling moth adults usually start appearing in the southern part of the state about the middle of June. These will be quite numerous if the first brood was not controlled and are the ones that cause the wormy fruit late in the summer. Oriental fruit moths usually start infesting the peach fruits a bit before harvest also.

The Insectaries of the Spray Service will be in operation to study and report this late summer insect and disease activity to the fruit growers.

A NEW FRUIT CIRCULAR

Fruit growers in Kentucky will be interested to know that a new publication entitled "Tree Fruit Varieties for Kentucky" has been prepared by the Department of Horticulture and will be ready for distribution within a few weeks. This publication describes the tree and fruit characteristics of the standard varieties of apples, peaches, pears, cherries, plums, and nectarines, adapted to Kentucky conditions, and in addition discusses the merits of several new varieties of different fruits.

In preparing the bulletin, the author has had in mind both the commercial grower and home orchardist and it is hoped that this will fill a long felt need for a publication of this nature. To receive a copy when it comes from the press, address your request to the Department of Horticulture at Lexington.

SUMMER BUDDING OF FRUIT TREES

The operation of fruit tree budding is very simple, and is easy to perform. Budding, along with grafting is used by our nurseries in propogating practically all of our fruit trees. The art of grafting is also easy to master. In budding, we simply transfer a live bud from a known variety to a stock or seedling and when this bud grows, it develops into the same kind of fruit as was produced on the tree it was taken from. Budding is usually done during the latter part of the summer or early fall, while the bark is "slipping". In grafting we transfer a short portion of last season's new growth which contains *several* buds to the stock or seedling. It then grows and produces the same type of fruit as its parent tree. Grafting is usually done during the late winter or early spring. Both buds and grafts are securely wrapped or tied and grafts are usually waxed about the union with grafting wax.

There are many times a year on practically every fruit farm when budding and grafting could profitably be done by the owner if he knew how. Most every grower has a few trees he would like to have top grafted to some other variety. Many plantings of delicious and winesap need some other variety grafted into a portion of the trees to furnish cross-pollination. Many growers have a peach, plum, pear, or apple tree of unknown variety that bears heavily and regularly for them. These could easily be budded on to other trees.

While it is most satisfactory in most cases to purchase young trees from reliable nurserymen, some growers take great pride in budding some nursery stock of their own. The late Mr. Mark Ligon, fruit grower of Sedalia in Graves County, was deeply interested in budding and taught several groups of 4-H club boys how to do this work, several of whom have since done considerable commercial work in this line.

The budding season is just ahead of us. Instructions can be had from several U.S.D.A. bulletins on Plant Propogation and from most any text on fruit growing. It is hoped that more growers and their sons take up this practice. It will make of them better fruit growers and horticulturists. The requirements are, material to work with, a sharp knife (any pocket knife will do), a fair understanding of what is to be done, and a willingness to practice and learn.