

KENTUCKY FRUIT NOTES

W. D. Armstrong, Horticulturist, Editor

PEACH THINNING

By W. D. ARMSTRONG

The untimely heavy freezes and frosts of early April reduced the Kentucky peach crop prospects; however, a number of growers may still have a full crop and a heavy thinning job. The original bud crop was the heaviest in years and the peaches bloomed earlier than in several years.

The prospect of a peach crop brings to mind the laborious fruit thinning operation that is ahead if the crop suffers no further cold or frost damage. The current labor shortage will make the operation difficult and it will be up to the growers to work out their labor problems and decide on a method of thinning that will enable them to cover the greatest number of trees in the time available. The old system of hand thinning is slow and while satisfactory in normal times can hardly be depended upon entirely by the large grower in 1944.

Time to Thin

Much thinning in Georgia is done in the pink bud and blossom stage by both the hand and "brush" method. These methods work satisfactorily in sections not frequently having crop-reducing frosts or freezes after blossoming. In most other sections thinning is generally done between the time of the June drop and pit hardening time. Tests in Illinois and other states have shown that while the greatest benefit is from the earlier thinning, some benefits can be had if thinning is done right on up to harvest time.

Thinning Methods

One should follow a rather definite method of thinning to insure a spacing of the fruits that will permit satisfactory development.

A simple rule of thinning followed in some states is as follows: Leave one peach on twigs 6 inches in length and less, leave two peaches

on twigs 12 inches long and three peaches on twigs 18 inches and over. By applying this simple rule it is interesting to note how readily a crew can be trained to use it.

Several recent methods, using short sections of rubber hose to knock off and dislodge some of the fruits, have been described and are being used with some success. Others have developed a practice of using small wooden sticks in thinning. At the Eison orchard, near Paducah, the stick method of thinning has been used for several years and is considered satisfactory and rapid. A straight stick or a piece cut from a sapling about $\frac{3}{4}$ " in diameter and 5 feet long is used. One end is flattened down to a long oval, wedge-shaped point that can be easily inserted between peaches and into large clusters and part of them dislodged simply by turning the stick. Where peaches line both sides of a twig, all on one side can be dislodged by quickly rubbing the stick along this side. This removes half the fruit; the others can be spaced by short quick movements of the stick. It should be pointed out that this is not a beating or thrashing practice but rather a rubbing and prying operation that when used by a careful operator does very little bruising of twigs and foliage. This method is suggested for trial. After a crew has been instructed, the owner can soon pick out the ones who are taking to it. The others can then be given additional instruction or put to thinning by a different method or put at other work.

A common practice in Kentucky has been to wait until after fruit has blossomed and set before pruning. Then at pruning time the fruit can be thinned also by clipping out heavily fruited twigs and small limbs. Then after this type of thinning is done a small amount of touch-up by other methods is needed. Even where pruning has been done earlier, some growers prefer to take

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hand shears, lopping shears or even pole pruners with them at thinning time to open up thick fruit clusters and places ahead of the regular thinning crew.

The disadvantage to this late combined thinning and pruning operation is that it requires the removal of considerable foliage and if this is continued far into June and to excess, has a devitalizing effect upon the trees.

Spacing Fruit

Much has been written and said about distance between spaced fruits. This depends more on the type of soil and its productivity than on any general rule. Five or six inch spacing is usually thought of as satisfactory, but some productive soils can size up more fruit and thin soils less.

Where fruit is in clusters near the base of twigs, fruit can be left closer together and still size up than when the fruit is distributed all up and down the twigs. In other words, an 18" twig will size up 3 peaches about as well if they are only an inch or so part, as it will if they are 6 inches apart; so don't break up the clusters at the base of the twigs, just to be doing it, when the upper blossoms have been killed by late frosts.

NEW INSECTICIDE—D D T

By W. D. ARMSTRONG

Editor's Note: Due to the fact that this new insecticide has been mentioned several times recently, though none is now available, we print this notice to keep Kentucky fruit men informed on important developments.

Scientists in Switzerland recently developed a powerful new synthetic chemical called dichloro-diphenyl-trichloro-ethane. By reason of this long name it is usually spoken of as D D T. D D T is a most effective body-louse killer and practically the entire output manufactured in the United States is reserved by the armed forces. It is reported to be effective in safeguarding our soldiers, sailors, and marines the world over from insect pests and insect borne diseases.

A number of tests of D D T to find out possible post-war uses have been

made by government workers with the very limited amount now available for non-military use. In the first test against the apple codling moth by the United States Department of Agriculture at Vincennes, Indiana, in 1943 D D T gave excellent results and was considered one of the most promising materials ever tested. More extended tests will be made this year. The material is effective against eggs, worms, and adults and as both a contact and stomach poison. Insects crawling on the sprayed surface long after it has become dry will be killed. It is known to have killed house flies when they light on walls or screens several months after the walls or screens were sprayed. It is likewise very deadly to roaches, bedbugs, flies, and mosquitoes as well as many plant lice, squash bugs, and other pests difficult to control. There is also good evidence that D D T will kill some beneficial insects and parasites. This indicates that extensive tests will have to be made before the material is released for general use.

Needless to say, this material is being studied with great enthusiasm and gives evidence of wide commercial possibilities when the war is over or after military needs have been met.

BITTER ROT

By W. D. ARMSTRONG

Bitter rot caused far greater loss to Kentucky apple growers in 1943 than in any other recent year, and some look for an even wider outbreak in 1944. In order to cope with this threat a few facts and observations regarding this disease are in order.

It is generally considered that bitter rot spreads more rapidly in wet, warm, humid weather in early, middle and late summer. This caused some confusion among fruit men in 1943 since the disease evidently spread rapidly during the hot, dry weather that prevailed from mid-June on well into August.

It should be remembered, however, that there was a great excess of moisture well up into May and early June in most parts of the state. This condition was evidently very favorable for growth of the inoculation spores from the overwintering fruit mummies, stems, and

cankers and even lasted long enough for the first fruit infections to be made. After heavy early infections were started, they were soon producing spores that in turn produced secondary infections. The last few seasons have shown that there is enough moisture following heavy dews and during cloudy periods following brief showers and on high humidity days for bitter rot spores to germinate and cause infection. Since there was very little rain to splash and spread the bitter rot spores about, it is further proof that flies and other insects played a large part in spreading bitter rot infections in 1943. It seems that the very favorable conditions for the development of bitter rot that result from very light showers and humid, steamy days have been generally overlooked by growers in studying outbreaks of bitter rot.

In general, growers were not aware of bitter rot infections in 1943 until the spots started showing on the fruit about mid-June or early July. The presence of visible fruit infections is too often the signal for a grower to start bordeaux sprays to prevent further infections. This is basically the improper procedure, for repeated tests have conclusively shown that if one waits until bitter rot spots can be seen on the fruit before starting bordeaux sprays, the disease can never be checked as satisfactorily as when the sprays were started before infections were visible. The same condition is true but to an even greater extent with black rot on grapes; in which case, the important sprays are applied just as growth starts.

Extensive tests of new materials have thus far produced nothing as effective against bitter rot as standard bordeaux mixture that is made up fresh in the spray tank from copper sulfate (bluestone) and lime or from stock solutions. The tendency has been, in orchards known to have bitter rot, to start special bordeaux sprays about the middle of June but evidence secured in 1943 indicated that earlier spraying should be beneficial. In a bitter rot spray test at Owensboro, where the first bordeaux was applied on June 7 and followed by five more sprays at 2-week intervals, the disease was not satisfactorily controlled. One test tree that got the first spray on June 7 but had no later sprays had only

slightly more bitter rot than the trees getting the full schedule. This indicated that early spray was probably the most effective and, that for more complete control, the bordeaux spray should be started earlier, that is by the last week in May or the first of June. In regard to spray russetting it should be pointed out that the trees in the above spray test were Golden Delicious and that the ones that received the six bordeaux sprays at 2-week intervals, starting June 7, were not russeted as a result and had an excellent finish at harvest. It is being realized more generally that much of our fruit russetting on Golden Delicious is being done, when sprays are applied when the humidity is high, drying conditions are poor and the temperature is above 90°; also likely by caustic sprays in the pink and calyx stages. And, furthermore, that there is little danger of russetting the fruit by spraying it with several 4-6-100 bordeaux sprays after it reaches an inch or so in diameter, if drying conditions are good.

The recommendation then for the grower who had serious bitter rot trouble in 1943 would be to start in late May or very early June and apply four applications of 4-6-100 strength bordeaux at 10-day intervals. This period would probably overlap the fourth cover spray for first-brood codling moth and probably the first spray for second-brood codling moth. Where this is the case, it should be understood that arsenate of lead is generally added to the bordeaux sprays whenever the spray is to be effective against codling moth, also. Our word of warning would be to never wait until you see the first bitter rot spots if you expect to control the disease. The successful fight against bitter rot is chiefly a preventative rather than a cure after the disease has broken out. Where the disease does get a start and spots can be seen, the recommended procedure, as in the past, is to spray immediately with 4-6-100 bordeaux covering the infected trees and those near them to try and check the spread of the disease, and to pick off and destroy as much of the spotted fruit as possible. This spray should be repeated at least twice at weekly intervals to build up a copper deposit that will be at least partially effective against the spread of the disease.

THE PLUM CURCULIO SITUATION

P. O. RITCHER and
W. D. ARMSTRONG

The finding of the first 1944 curculios by jarring on April 10 at Princeton started off the 1944 curculio season. This issue of the Kentucky Fruit Notes will not likely be out in time to be of much service against the first-brood of curculio. However, this is being written with the idea of shedding some light on second-brood activities and some of the work recently done in Kentucky regarding this pest.

In both 1942 and 1943 extensive work was done by the Experiment Station in studying the second-brood activities of the plum curculio. Some second-brood curculio were reared in stocked cages each summer and a great many more were jarred from the trees each year under actual orchard conditions. By making feeding and egg laying observations and by the dissection of adult curculios, it was determined that there was to be a fairly heavy summer brood each of those years. As a result of this work, spray notices were sent out recommending that a month - before - harvest arsenical spray be applied to control these late peach worms. Each year a great majority of peach growers in western Kentucky applied this late spray and, in general, secured excellent curculio control. In one block of Elberta near Mayfield the month-before-harvest spray reduced the curculio infestation to 3 percent. In an adjoining block of trees of the same age where this spray was not applied, due to labor shortage, there was 11 percent of wormy fruit. This late spray not only reduced the worm injury to the peach crop but killed off a number of the adults that would have otherwise gone into winter quarters to be on hand to cause more trouble in the spring of 1944.

In 1943 the influence of summer rainfall on the emergence of curculio was again demonstrated. On two occasions very heavy emergence followed immediately after soaking rains. This fact has been known for some time and leads to the belief that we are apt to have heavier second-brood curculio injury where we have heavy rains in late June or

early July to speed up the emergence of the summer crop of adults. Since all of Kentucky is in the potential second-brood curculio area, it would be well for all Kentucky peach men to keep this weather factor in mind.

In studying the behavior of newly emerged adults in late June and early July, 1943, it was observed that 2 or 3 weeks elapsed after the emergence of adults before they deposited eggs. This fact enables us to wait until a great many of them have emerged so that one spray, well applied, can kill the greatest number of adults.

In both 1942 and 1943 the young curculio worms started leaving the young dropped peaches and entering the soil about mid-May. These then remained for some time in the upper three inches of soil where they pupated. They did not emerge as adults until the latter half of June. Thus there was a period from late May through early June when a great many of these pupating curculio can be easily killed by disking or harrowing or by any type of cultivation that will stir up the top 3 or 4 inches of soil. This is considered an important curculio control practice in peach orchards that are cultivated and a good argument for cultivation.

Another commercial practice that is very effective in curculio control is the picking up and destruction of the wormy peach drops early in May. Also sows and hungry pigs running in an orchard at that time will destroy many worm infested drops.

The several phases of curculio control work are being continued in 1944 and information as to our findings will be forwarded to the peach grower in the spray service letters.

AMMONIUM NITRATE, THE NEW NITROGEN FERTILIZER

By W. D. ARMSTRONG

Due to war conditions and shortages most of the regular forms of nitrogen previously in general use, such as nitrate of soda, sulphate of ammonia or calcium cyanamid will not be available generally in sufficient quantities. A new form of nitrogen known as *ammonium nitrate* will generally be available and at present prices is a very economical buy. This material contains from 32.5% to 34% nitrogen, which is twice as

much nitrogen as is contained in 16% nitrate of soda and over 1½ times as much as is contained in 20% sulfate of ammonia. Due to this high nitrogen content only half as much ammonium nitrate should be used when it is being substituted for nitrate of soda. The material is not effective as quickly as nitrate of soda but somewhat quicker than ammonium sulfate. In other words its effects have been described as approaching those of a half and half mixture of nitrate of soda and sulfate of ammonia. It has been tried extensively in Kentucky and other states and has given satisfactory results on strawberries, tree fruits, corn, pastures, and cover crops in spring and summer applications. Fruit growers and farmers in general can feel free to use this material without hesitation. Those that have used it report satisfaction at its behavior.

One form of ammonium nitrate is known as "nitraprills." This is the Canadian form and is also satisfactory.

A GRAPE BLACK-ROT SPRAY SYSTEM

By W. D. ARMSTRONG

All grape growers in the Kentucky section are familiar with the difficulty experienced in controlling black rot disease, especially during wet seasons such as the spring of 1943. It is also recognized by grape men that considerable spray material must be sprayed up into the vines from below rather than applied entirely from above. Due to the low growth of vines in vineyards, there has been difficulty in getting the spray man to shoot the materials up through the vines in order to get complete coverage on the bunches and on the lower sides of the leaves. One of the best systems in general use is for the spray man to have a water-proof covering on his left arm and shoulder and to slightly raise up the vines as the spray is directed under them by the spray nozzle in his right hand. This method is generally effective but is somewhat disagreeable to the operator.

After trying out several methods of grape spraying without a great deal of satisfaction, one Kentucky grower, Mr. Joe Bray of Bedford, Kentucky, and his boys, decided on a system that is working very well

indeed for them. A low sled some 4 feet long was tied immediately behind the spray tank and the two operators sat on the sled as the spray tank was driven between the rows. From this position, close to the ground, they were able to spray up under the foliage with great efficiency, great ease, and without any problem in handling the spray hose. Each operator sprayed the side of the row next to him, thus the two operators covered one complete middle and the machine was driven down each middle throughout the vineyard. Simple, try it!

WORKOUT OF THE OLD STRAWBERRY PATCH

By W. D. ARMSTRONG

The number of old strawberry patches that will be held over this year for another season's harvest is expected to be larger than usual on account of the shortage of plants, and the prospect for a continuation of good prices. How to workout the old patch after either the first or second harvest has been a moot question for many years.

A project covering this phase of strawberry culture was started in the summer of 1942; first harvest records were taken in 1943 and additional work was done in 1943 that will be recorded in the 1944 harvest. The 1943 results were published in the July 1943 issue of "Kentucky Fruit Notes." These records are reviewed briefly below.

Where the strawberry foliage was mowed close and the middles worked out with scratching tools (not barred off), the yield of the second year Blakemore plots was 175 crates per acre. Where the berries were mowed similarly but the middles *not cultivated*, the yield was only 139 crates per acre or a loss of 36 crates of \$6.00 strawberries, because the middles were allowed to grow up wild. Where the strawberry foliage was not mowed but the middles worked out with scratching tools (no barring off) the yield was 159 crates per acre. Where no cultivation was done the yield was 142 crates or a loss of 17 crates per acre. Heavy barring off on June 1 to six inch strips and these blocked out with hoes gave a yield of 139 crates per acre while barring-off one month later (July 1) gave

only 122 crates per acre, the smallest yield of all. This could be considered a costly delay in working out.

These records show conclusively that with or without mowing, a scratching type of cultivation for the middles with only very slight row narrowing gave far superior yields to either early or late barring-off. There was no essential difference in berry size between the two systems since approximately the same percent of each went into the U. S. No. 1 grade.

The yields for the uncultivated plots were not only reduced but the fruit was so small that most of it went into the Number 2 grade. However, more total fruit was produced than in either the early or late barred-off plots. All plots were fertilized at the rate of 300 pounds per acre with a 4-16-4 mixture.

As to the amount of time and work required, the barring-off with subsequent workings required far more time than to scratch-cultivate the middles. Of course, there was no labor to the non-cultivated plots except to mow the weeds off twice above the strawberry foliage.

The observations of the 1943 work shows these same trends. Since the summer of 1943 was unusually dry, there was rather slow recovery of the barred-off plots and the non-cultivated plots suffered keenly from grass and weed competition.

On the basis of this work to date and upon observations and work elsewhere it seems that a scratching type of cultivation started immediately after harvest preferably coupled with a close mowing of strawberry foliage offers an economical way to encourage maximum yields.

POST-WAR POSSIBILITIES

By P. O. RITCHER

For the past 2 or 3 years, workers in the Federal Bureau of Entomology and Plant Quarantine have been trying to develop sprays to kill overwintering codling moth worms in their cocoons on apple trees. Results obtained to date have been most promising. Complete information will be published as soon as the details are released.

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It has been known for some time that codling moths are attracted to light traps. The electrocuting types give the best results. Federal workers have found that a light trap in

every apple tree gave a benefit about equal to 2 cover sprays of lead arsenate. However, electrical light traps are not practical for general orchard use, as yet.

CONSTRUCTION AND USE OF CODLING MOTH TRAPS

By W. D. ARMSTRONG

Many apple growers have found it profitable to keep track of codling moth activity in their own orchard because the emergence and development of codling moth differs from farm to farm even in the same locality. The use of codling moth traps has been found to be one of the best methods by which to keep up with moth activity. The spray service is operating codling moth traps in the main fruit sections and gathers part of their reports from these, but this does not fill the complete individual need.

How to Make Traps: A good trap is made of two large-mouth quart glass jars wired together and hung in a tree. Most widely used bait traps are now made by using wide-mouth quart glass jars (in general use for home canning) with the two-piece or *Ker-top*. The flat tin disc is removed from the top and replaced by a circular piece of hardware cloth (3-mesh per inch or $\frac{3}{8}$ inch, not smaller) cut to fit the circular screw top. This wire mesh top prevents extra large moths and insects from entering traps and keeps out leaves and other foreign material. A small piece of wire is twisted about the neck of each jar, leaving a loop to the side. A larger wire hook is then hooked into the two loops so the jars hang side by side and either can be emptied or filled without disturbing the other.

Hanging the Traps in Trees: Traps should be suspended in the extreme top of the larger bearing trees and foliage should be cut away so that the trap is well exposed on one side or above. Some foliage should be within 12" of the trap. Traps are suspended from a small pulley or screw-eye attached to a high limb. The supporting cord should be of heavy throwline or light clothesline material. When the trap is drawn into place, a nail is then driven into the trunk of the tree near the ground and the lower end of the line cut off and looped over this nail. The traps

are then raised and lowered for examination by use of an extra cord with a snap attached that is carried from tree to tree. Ten traps should give a fair picture of moth activity in any one orchard.

Kinds of Bait and Methods Used: If available, dark brown sugar is preferred as bait. If this is not available any heavy sorghum or cane molasses will do. The bait is made up using nine parts of water to one part of dark brown sugar (No. 12 or 13) or molasses. This will take about two pounds of sugar to two and one-half gallons of water. At the first filling, bait should be mixed forty-eight hours before traps are filled. One yeast cake should be dissolved and added to aid start of fermentation.

At first filling each jar is filled one-half full. In ten to fourteen days the bait from one jar is poured into the other jar and the empty one filled with fresh material. Add twelve drops of *natural oil of sassafras* to each quart of fresh bait after filling trap. Each ten to fourteen days the bait in the old side of the trap is poured out and replaced with fresh bait. This keeps a newer bait and one ten days older in the traps at all times and makes them uniformly more attractive to the moths. In case the traps are flooded or the bait badly diluted by a rain, the best plan is to renew all baits.

Examining Traps and Recording Catches: Most codling moths fly at dusk on warm evenings (60° and above at sundown) and during the night. The traps should be examined by nine o'clock each morning. The tops of the traps are unscrewed and the moths which will be floating on top of the bait should be removed with a screen wire dip or an old tablespoon with narrow slots made in its bottom with a hacksaw. The number of codling moths caught should be recorded and the bait stirred at each examination. Codling moths can be easily identified after very little experience and with very little instruction. A helper can be taught to examine the traps and can do so regularly each morning at a very slight loss of time from his other duties. Daily examination of traps is advised; for when moths are left in for two days many sink to bottom and others become weathered and hard to identify. Start operating bait traps right after apple petals have

fallen so you will catch some of the first ones that emerge.

Timing Sprays by Trap Catches: The first moths usually emerge and will be caught about 10 to 14 days after petal fall. Moths start egg-laying one or two days after they emerge if the evening temperatures are 60° or above and, in general, eggs start hatching in 10 to 14 days in spring if temperature stays 60° or above. Therefore, if your traps are up early enough to catch some of the first moths to emerge, you can expect a few worms to be hatching in 10 to 14 days. *A spray should be put on at the time the first worms are supposed to hatch.* Often moth catches continue to increase rapidly for 10 days to 2 weeks after first started. The heaviest egg hatch usually takes place 10 to 14 days after the heaviest catch and a spray should be applied at that time.

Therefore, the traps should help a grower get a spray timed to go on just ahead of first worm hatch and also just ahead of the peak worm hatch. These two, first brood sprays following a good calyx spray should go a long way toward cutting down the first brood attack. If trap catches continue heavy over a period or if cool weather disturbs the emergence and flight an extra spray may be indicated.

In a like manner traps can be operated during June and early July to obtain similar data on the second brood. One should keep in mind, however, that during the warm weather of late June and early July the codling moth eggs start hatching in 5 to 10 days, hence sprays should follow peak flights more closely than during the first brood.

NATIONAL PEACH COUNCIL FEBRUARY MEETING

W. W. MAGILL, Lexington, Ky.

The meeting of the National Peach Council in St. Louis, February 23-24, was called by the retiring president, Carrol Miller of Martinsburg, West Virginia, and was attended by 59 delegates from 18 leading peach states, producing 77% of the U. S. peach crop, which made the meeting by far the most complete assemblage of United States peach growers on record. Mr. Frank Street, of Henderson, and I represented Kentucky.

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The National Peach Council was organized February 7, 1942, at Charlotte, North Carolina, by growers from eight Southeastern states, to give the peach industry a united single effective voice in Washington, to work toward the solution of such problems as new markets and new by-products, and to coordinate the work that several peach states were doing in advertising and promotions.

The new officers elected were:

David Perrine, Centralia, Illinois, President.

Tray H. Cribb, Spartanburg, South Carolina, First Vice President.

Charles B. Weeks, Brentwood, California, Second Vice President.

Carrol R. Miller, Martinsburg, W. Virginia, Executive Secretary and Treasurer.

It was agreed that each member state producing less than a million bushels per year will have one director in the Council and that states producing more than a million bushels will have two directors.

In financing the National Peach

Council, the following temporary assessments were agreed upon: \$300.00 per state producing more than a million bushels (California, Colorado, North Carolina, South Carolina, Arkansas, Illinois, Michigan, New Jersey, Pennsylvania, and Virginia), and \$100.00 per state producing less than a million bushels (Kentucky, Indiana, Delaware, Maryland, Missouri, Ohio, Tennessee, Washington, and West Virginia).

Carrol Miller was employed, on a part-time basis, to keep closely in touch with authorities at Washington, especially the OPA and WFA, as regards price ceilings. Mr. Miller is a commercial apple grower and distributor who has worked very closely with the National Apple Institute, and for the past two years has directed the National Peach Council practically without pay. The entire group attending the St. Louis meeting felt that Mr. Miller was the outstanding individual to serve as Executive Secretary of the Peach Council.