

35 tons of cane per acre are frequently obtained. Even greater yields are sometimes obtained under exceptionally favorable conditions. These estimates are for the plant-cane crop; that is, the first crop from a planting.

RATOON-CANE CROP

Yields from ratoon (stubble) crops in any locality are generally more subject to variation than those from plant cane, depending to a considerable extent upon the varieties of cane grown and the cultivation and care of the crop. Occasionally ratoon crops yield better than plant cane, but for an average it may be assumed that the first ratoon crop will yield about two thirds as much as the plant cane and the second ratoon crop somewhat less than the first. Subsequent ratoon crops usually yield less. It is uncommon for more than three crops, a plant cane and two ratoon crops, to be harvested from one planting, and in numerous instances the yield from the second ratoon crop is unprofitable. However, under favorable conditions and with good cultivation, some of the new varieties, such as, for instance, Cayana and C.P. 807, have produced from 3 to 5 profitable stubble crops.

SIRUP

Cane is not ordinarily weighed by the average grower engaged in the manufacture of sirup, the yield of sirup commonly being estimated upon the total number of gallons produced per acre rather than upon the number of gallons produced per ton of cane. Under good management of small-scale farm outfits for making sirup a yield of from 20 to 22 gallons of sirup per ton may be expected or, upon a basis of yields of 20 to 25 tons of cane per acre, a yield of from 400 to 550 gallons per acre. However, yields within this range may be expected only when good varieties of cane are grown, when the crop is properly fertilized and cultivated, when the cane is harvested at a reasonably advanced state of maturity, and where the cane is milled and the sirup manufactured in an efficient manner.

Data on production of cane sirup given in Yearbook of Agriculture 1932 shows that the average number of gallons produced per acre for all States in which cane is grown for sirup was 185.5 in 1928, 185.9 in 1929, 161.9 in 1930, and 142.9 in 1931. These figures clearly show that numerous growers secure yields far below those that can be obtained under good conditions and with good practice. It is probable that continued planting in the sirup sections of varieties susceptible to injury by mosaic and other diseases contributes largely to the low average. Most of the cane used for sirup is milled on small 3-roll mills, many of which are operated by animal power, and it is probable that the use of inadequate milling equipment, or even of worn-out mills, is an important factor contributing to low production of sirup. Thus, it is doubtful that the average farm mill extracts more than 50 to 55 percent of juice on the weight of the cane milled, whereas on a small but powerful mill driven by a gas engine upwards of 65 percent may be extracted. The quantity of juice represented by the difference between 50 and 65 percent extraction represents from 3½ to 5 gallons of sirup per ton of cane, de-

pending upon its maturity and the quantity of sugar in it, or, on a basis of a yield of 20 tons of cane per acre, from 75 to 100 gallons of sirup per acre which may be lost as the result of inefficient milling equipment. More careful attention to these and to the factors mentioned above should enable the grower to increase his yields and to produce cane and sirup upon a more profitable basis.

STORING CANE FOR PLANTING

If the new plantings are not made in the fall, some means must be employed for storing the cane in localities subject to winter frosts until it is time to plant it, which is usually in the spring. Two methods of storing are in common use—windrowing and banking. The methods of harvesting cane intended for seed also differ, many



FIGURE 13.—Sugarcane in windrows ready for covering in Louisiana. The cane from 2 or 3 rows is laid in one of the deep middles formed by cultivation, the tops overlapping, and then covered with earth. The soil is thrown on the cane by means of a turplow and the covering is completed by hand with shovels.

growers digging up the stalks with the rootstock left attached and others merely cutting them at about the ground level. The former method permits use of the short rootstocks, which bear a large number of buds or eyes. However, if a crop is to be grown from the stubble, digging into it for the purpose of removing the rootstock has a harmful effect upon the growth of and yield from the succeeding crop.

STORING CANE IN WINDROWS

Windrowing (fig. 13) is generally practiced on the large cane plantations, like those in Louisiana, where large quantities of cane must be stored in a relatively short time. The ridge method of cultivation results in deep furrows being formed in the middles between rows during the cultivation. The cane from 2 or 3 rows, cut off at the ground and without removing the foliage, is laid into one of the middles, overlapping in such manner that the tops always

cover the stalks previously laid down. The windrow thus formed is covered with soil by the use of large plows, throwing about two furrows from each side over it. If the soil is cloddy or wet, a disk cultivator is sometimes driven over the windrows to smooth out the soil that the plows have thrown up, and finally shovels or hand hoes are employed to fill in such gaps as the plows and cultivator may have left. At planting time the cane is pulled out of these windrows by a mule dragging a specially constructed implement with prongs or hooks crosswise of the rows.

STORING CANE BY BANKING

The storage of cane by banking is similar to windrowing in principle, but the layer of cane is usually deeper and the space covered wider. The depth of the cane in the bank before covering is from 18 to 30 inches and the width from about 5 to 10 feet. The length



FIGURE 14.—Banking sugarcane for spring planting. The layer of cane is deeper and wider than that in a windrow, and it must be covered mostly by hand.

of these banks is governed by convenience. Only the edges can be covered with plows, and the center strip of the bank must be covered by hand with shovels (fig. 14). Usually it is all covered by hand. About 1 to 2 inches of soil is put on the bank. At planting time the soil is shoveled off these banks and the cane pulled out by hand and stripped of leaves and topped. It is thus seen that banking the cane, while possibly somewhat more economical of planting material, requires proportionately much more hand labor, and can therefore be practiced only where the cane areas are small and the labor available is abundant.

WHEN TO STORE

Whether the cane is to be banked or windrowed, it is necessary to take every precaution to see that it is well matured and that it is kept as cool as possible in storage without, however, exposing it to injury from freezing temperature. The nonavailability of labor while harvesting for the mill and the danger from frosts lead the

planters usually to store the seed cane before beginning to harvest for the mill. This involves some sacrifice in the maturity of the cane. Cool, wet days are chosen, if possible, for the work of storing. If the ground is warm and dry, it is advisable to scrape away the surface soil immediately before putting down the cane. If it must be banked during warm weather, it is also desirable, conditions permitting, to bank only in the cool of the morning, or even during the night, covering the cane before it warms up in the midday heat. These precautions are necessary to guard against serious losses by red rot during storage.

DISEASES OF SUGARCANE

Numerous references have been made to diseases of sugarcane in preceding sections of this publication. The subjects of cane varieties, field practices in handling the crop, and diseases of the cane are so interrelated that it is impossible to discuss them independently. In comparatively recent years cane diseases have profoundly influenced the methods of cane culture in the United States by reason of the adoption of varieties differing in essential qualities from those previously grown. The change in varieties was a necessary consequence of the accidental introduction of a foreign disease. To be specific, mosaic, an introduced virus disease, became widespread about 20 years ago and resulted in the failure of the varieties Louisiana Purple, Ribbon, and D-74, which collectively occupied practically the entire acreage devoted to cane in this country. By the efforts of the Department of Agriculture varieties were found or developed which resisted this disease. These varieties—Cayana, P.O.J. 36, P.O.J. 213, P.O.J. 234, P.O.J. 36-M, Co. 281, C.P. 807, and, more recently, Co. 290 and C.P. 29/116—were distributed and rapidly gained favor with sugar and sirup planters because in the presence of mosaic the resistant varieties proved definitely superior.

More than 400,000 acres of land are now occupied by new varieties, and the old varieties have been discarded to the degree that they are nonexistent on sugar plantations and exist to only a limited extent in the centers of sirup production. Their complete elimination is now recommended because they are a source of mosaic infection and are no longer needed for chewing purposes, since the recent release of the superior variety C.P. 31/511. The characteristics of the new varieties are so essentially different from the old that their adoption has brought about significant changes in field practices, such as the amount of planting material required, which is much less; the period of ratooning or stubbling, which is longer by 1 or 2 years; and changes in rotation and fertilizer practice and other details of the industry extending to the harvesting and the fabrication of the crop in the mill. The importance of precise knowledge of cane diseases and their potential destructive or revolutionary effects cannot, therefore, be overemphasized, and sufficient familiarity with the common diseases to enable recognition by the grower will be definitely to his advantage.

It is deemed fortunate that only four of the major cane diseases of the world have been reported as causing damage in the United States. Many times that number are in existence elsewhere and could logically be expected to gain a foothold in this country if permitted to enter. It is for that reason that entry of cuttings or other live parts of the sugarcane plant from abroad is prohibited under the