

the sirup made from it is less likely to crystallize. The reason for this is that the immature cane, while containing less sucrose (common sugar), contains more reducing sugars, the presence of which in the sirup lessens its tendency to crystallize when boiled to the usual density. Sugars of this kind do not affect the flavor, taste, or food value of the sirup, but cane should not be harvested when too immature, as sirup produced from such cane cannot be made clear and light colored and usually possesses an objectionably strong and sometimes even a bitter taste.



FIGURE 11.—Harvesting sugarcane in Louisiana. The stalks are cut at the ground level, the leaves stripped off with the back of the cane knife, and the tops cut off. The stalks are then thrown into piles, the yield from four rows usually forming the "heap-row" or "middle" which is kept free from trash to facilitate loading on wagons. The variety represented is P.O.J. 213.

Harvesting, which is almost universally done by hand, consists of stripping off the leaves, removing the tops, and cutting off the stalks at the bottom. The tools used consist of specially designed cane knives and stripping implements (fig. 10). In Louisiana the customary practice is to cut the stalk at the level of the ground, strip off the leaves with the back of the knife, and cut off the top (fig. 11). In the eastern Gulf States the customary practice is to strip off the leaves with a stripping tool, cut off the top, and then cut the stalk at the bottom (fig. 12). In most instances sharp hoes, instead of cane knives, are used for cutting the stalks at the bottom. In either case, the stalks are thrown into piles for convenience in loading and hauling. The lower part of the stalk is more mature, and therefore contains more sugar, and the grower should save as much of it as

possible by cutting it at the level of the ground. Cutting at a higher point is wasteful, leaving stubble several inches in length and resulting in a loss of a ton or more of cane per acre. The upper part of the stalk is least mature, and the topmost joints are of little or no value for the manufacture of sirup or sugar. Therefore, depending upon the maturity of the cane and whether it has been injured by frost, two or more of the topmost exposed joints should be discarded when the top is cut off.

In some instances, especially where it has been windrowed to save it after it has been exposed to severe frost, the growers are inclined to mill the cane without removing the leaves. This practice should not be followed, as the leaves not only decrease the quantity of extracted juice but tend to result in the production of cloudy, dark-colored, and generally inferior sirup.



FIGURE 12.—Harvesting sugarcane in Georgia. The leaves are beaten off with the back of the knife or removed with a special stripping tool, the tops are cut off, and the stalks cut off at the bottom and laid in piles for loading on wagons. The varieties represented are: Left, C.P. 807; center, P.O.J. 213; extreme right, Cayana.

## YIELDS

### PLANT-CANE CROP

The yield of sugarcane and sirup is so dependent upon soil, fertilizer, climate, weather conditions, and varieties of cane grown as to preclude exact statements regarding probable yields. On good sugarcane land in the principal sirup sections of Georgia, northern Florida, and other States, under good treatment as regards fertilizer application and cultivation, and in a year with favorable weather conditions, a yield of 20 to 25 tons per acre of cane, stripped and topped, may reasonably be expected from varieties such as C.P. 29/116, Co. 290, and P.O.J. 213. On good soils in southern Louisiana and Florida, and under favorable conditions elsewhere, yields of 30 to

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