middles. Cultivation is ordinarily carried on in such manner that the rows remain elevated above the middles, the latter serving as drainage furrows to quickly carry off surplus rainfall. Elevation of the rows depends largely upon the location and character of the land and the experience of the grower regarding the best conditions for securing adequate drainage.

The only difference in the cultivation of fall-planted cane, the rows of which should be covered late in the fall with a few inches of soil as a protection against cold, is that the rows are barred-off as early in the spring as the weather and the condition of the cane will permit and the soil scraped off of the top of the row (fig. 9). To off-bar means to plow a furrow away from each side of the cane, usually with a turnplow, leaving a ridge about a foot wide. This ridge is then scraped off with hoes or with a suitable implement, leaving 1 to 2 inches of soil over the cane.

RATOON-CANE CROP

Profitable sugarcane production depends to a large extent upon the yields obtained from ratoon (stubble) crops, and it is important that the stubbles be given timely and careful treatment. The customary practice is to burn the trash shortly after the cane has been harvested and then to "wrap" the stubble rows by throwing a furrow to them from each side by means of a turnplow. At the same time the remainder of the space between the rows is plowed with the turnplow. The crop is left in this condition through the winter. From the standpoint of improving the physical condition and fertility of the soil, especially of the lighter types of soil, turning the trash under appears preferable to burning it where it is feasible to do so without interfering with proper protection of the stubble rows. In lieu of "wrapping" some growers prefer to protect the stubbles through the winter by leaving the trash in the fields. This practice serves the purpose, especially if the trash is heaped directly upon the rows.

Treatment in the spring is about the same as that for fall-planted cane; that is, excess soil is removed, the rows are off-barred, and weeding and cultivation begun. Early cultivation should be relatively deep, but later in the season it must be shallow, in order to avoid injuring the roots which spread out near the surface. Practice followed in the application of fertilizer varies; in some instances the total quantity to be applied is distributed early in the season either in the off-bar furrow or as a side dressing, and in others the major part is applied in this manner and the remainder as a side application about the middle of May. The total quantity applied varies, depending upon local conditions and practices, but it is important that sufficient fertilizer be applied to insure rapid and satisfactory growth.

In the sirup sections of the eastern Gulf States, most of the cultivating and planting operations are done with 1-mule implements. This practice is in part justifiable because of the small patches prevailing, and also, in the rolling sections, because of many short rows resulting from laying off the rows on contour lines along the hill sides. In fields in which long rows prevail, however, there is undoubtedly room for improvement in the efficient utilization of a laborer's time by using 2-mule implements.

Cultivation generally ceases and the crop is laid by about the middle of July or the first of August. By this time the crop shades the ground and the rows have spread out until it is impracticable to get through with single-mule implements.

HARVESTING

With the coming of cool nights and moderately cool days in the fall, usually in October, the cane begins to mature[6] and rapidly stores up sugar in the stalks. With suitably cool weather it may be in condition to permit the beginning of harvesting and grinding by the latter part of October, though throughout most of the areas in which it is grown for sirup the growers with small crops to dispose of prefer to wait until the middle of November. In southern Florida, where early winter frosts rarely occur, the beginning of the harvest may be delayed until December.

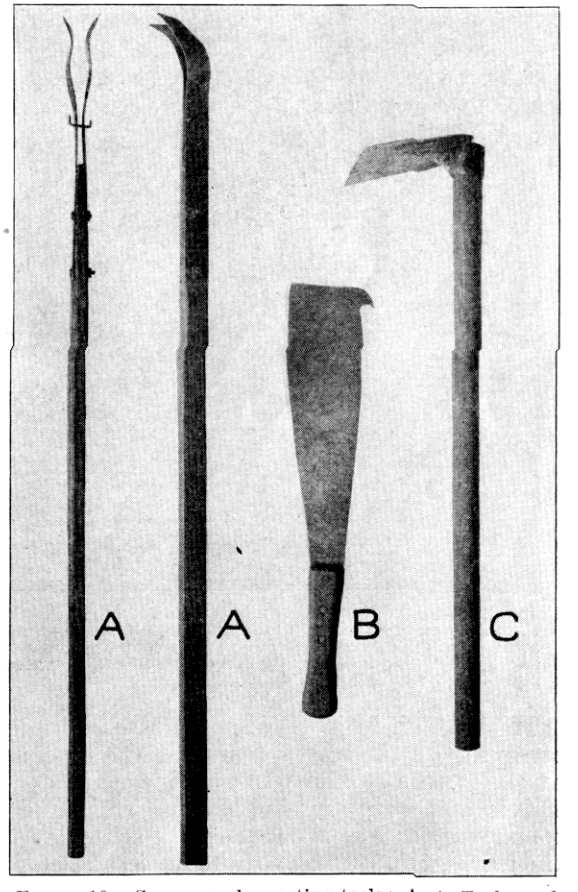

FIGURE 10.—Sugarcane harvesting tools: A, A, Tools used in Georgia and adjoining States for stripping the leaves from the standing cane; B, a type of cane knife commonly used for cutting the stalks; C, hoe of a type used when the stalks are cut below the level of the soil.

The cane continues to mature until its growth is stopped by frost, and the later in the fall or winter that harvest can be delayed the greater the yield of cane and sirup. However, frosted cane is liable to deteriorate rapidly and, therefore, harvesting should be begun enough in advance of the earliest probable frost to permit the major part of the crop to be harvested before the cane is seriously injured by cold. Slightly immature cane is not only less objectionable for sirup than it is for sugar manufacture but is usually even advantageous in that

[6] The term "mature" as used here means that the cane has reached a stage of development suitable for making sirup. In the United States sugarcane never matures in the sense of developing flowers and true seeds except in southern Florida.

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