ing dates of sorgos in Mississippi. The dry parent, therefore, was in the dough stage of maturity by Aug. 20 and was harvested on that date at State College while at the same time the juicy Honey in that test had not yet headed. In 1955 the dry Honey was 2 to 3 weeks earlier than the juicy Honey at State College and Meridian, Miss. Apparently this dry segregate does mature early under special seasonal conditions. This factor could very well explain how the commercial seed lot was all dry stalked even though sorgo was entirely self fertilized. The amount of natural crossing would also have a profound influence on the rate of increase of the dry segregates particularly since this character is dominant.

These data indicate that (1) this dry Honey appears to be a dominant mutation out of and is similar to the normal juicy plants in other characteristics such as head and seed types, color, height, number of tillers, etc. but has a tendency under some conditions to be earlier; (2) that the dry stalks of this mutation were inherited in the same manner as dry stalks of normally dry varieties, i.e., as a simple dominant \( DD \) to juicy stalk \( dd \); (3) that the stalks of the dry \( F_2 \) progeny and the dry parent weighed about half as much as those of the juicy strains even though they were all the same size; and (4) that only about 60% as much juice was extracted from the dry strains as from the juicy strains on an experimental mill.—OTTO H. COLEMAN, Agronomist, Field Crops Research Branch, A.R.S., U.S.D.A. This study was partially financed through the cooperation of the Mississippi Agr. Exp. Station.

SUBSOILING, PLOWING, AND DEEP PLACEMENT OF LIME OR FERTILIZER IN ONE OPERATION

THE problem of soil compaction, i.e., the formation of dense soil layers and plow soles by implement traffic, has recently received considerable attention. Farmers, implement dealers, soil scientists, and agricultural engineers need information on methods and equipment for subsoiling and loosening compacted layers of soil.

In order to meet this condition of soil compaction and its restricting effect on root penetration and crop growth, investigations were initiated at this Station. The objective of this research was to study ways of alleviating soil compaction by employing subsoiling or deep tillage methods for improving the effective rooting depth and growing environment of tobacco, corn, and vegetables.

An experimental machine (figures 1 and 2) has been built that makes possible subsoiling and deep placement of lime or fertilizer all in one operation with regular plowing.

The basic design of this machine is different from the standard chisel-point subsoilers in that it operates from the bottom instead of behind it (see figures 1 and 2). With this arrangement the furrow bottom plus plow sole and subsoil are loosened after the wheel has traversed and packed it and just before the slice is turned. In this way the loosened soil compaction pan is well preserved since dirt that had been shattered, it is covered up by the next slice.

The machine was mounted on a Farmall 140, equipped with C-199 single-bottom hy- two-way plows (figure 1). A standard Farmall model No. 10-89 subsoiler beam was attached to the rear axle of the tractor. U- \( \frac{3}{8} \) by 2-inch steel were bolted to the subsoiler beam on either side of the wheel and fastened to the plow sole with a split bearing made of heavy steel plow sole. The bearings run on brass sleeves fastened to the subsoiler beam, Collars fastened with set screws on either side of the sleeve keep the bearing assembly in place and provide lubrication.

A side-arm fork attached to the beam rests on the plow beam making possible plow sole and subsoiler operation from the rear of the tractor. The hopper tubes run on brass sleeves fastened to the subsoiler beam and fastened with set screws on assembly. This design differs also from that of the T. N. type plow, for the subsoiler works in front of the plow sole and subsoil to a depth of 16 inches in conjunction with plowing to a 8 to 9-inch depth.