of attaching this equipment to the tractor and belt-type fertilizer hoppers is made clear in figure 2.

Figure 1 shows an assembly of eight single disk furrow openers obtained from a discarded grain drill. (Those shown came from an old McCormick-Deering drill, but essentially similar disks may be obtained from other grain drills.) The frame of the drill was disassembled, leaving the drawbar pivot brackets of eight of the disks attached to the front, or transverse, frame member, and the rockshaft attached to the pressure spring rods.

Two pieces of angle iron are welded or bolted to the transverse frame member, approximately 28 inches apart (A in figures 1 and 2); when bolted to the front axle of the tractor, these serve to support the front end of the disk draw bars. At the rear the disk assembly is supported in the tractor tool carrier clamps by means of the rockshaft. The force necessary to propel the disks is transmitted from the tractor’s tool carrier to the transverse frame member of the disk assembly by means of two rods (1/2-inch water pipe), shown at B in figures 1 and 2. These are attached to the rockshaft by means of the original rockshaft lever arms from the drill; at the front end (C, figure 2) they have a 1-inch longitudinal slot which provides the freedom of movement necessary for lifting the assembly with the master lift of the tractor. Pressure spring rods are shortened (15 inches); it is not necessary to shorten the springs. Pressure to force the disks into the soil is applied to the rockshaft by means of the tractor master lift lever.

In using this equipment to apply eight bands of fertilizer simultaneously to grain or other plots, each of the four belt-type fertilizer hoppers supplies fertilizer to two disks. It is necessary, therefore, to divide into two streams the single stream of fertilizers metered by each hopper. Construction of the dividers used is indicated in figure 3. They attach to the spouts of the hoppers, as indicated at D, figure 2. The original helical downspouts from the grain drill are used to conduct fertilizer to the disks. With the dividers attached to the hopper spouts, the divider plates may be positioned by hand. These dividers give nearly—but not always exactly—equal division of the fertilizer stream. They divide with sufficient accuracy for most applications. The belt is loaded with the amount of fertilizer required for the area served by two disks and, although not always divided exactly in halves, the calculated amount of fertilizer is applied in two streams within an area no wider than twice the distance between disks.

As shown in figure 1, our machine applies fertilizer in bands 7 inches apart to a strip 56 inches wide. On occasion, we have increased the width of fertilized area to 80 inches, by spacing the disk drawbar pivot brackets farther apart on a transverse frame member and spacing the rockshaft lift arms correspondingly on a rockshaft. This necessitates movement necessary for lifting the assembly with the master lift of the tractor.

A SIMPLE METHOD FOR DISTINGUISHING TALL AND MEADOW FESCUE

UNDER certain environmental conditions tall fescue (Festuca arundinacea Schreb.) and meadow fescue (F. elatior L.) are difficult to distinguish. They are found growing in mixed populations of growth type so that the two overlap. In a comparative study of the two species Hitchcock (1) used robust distinguishing characteristic, but no satisfactory arrangement for positive identification. Saint Yves (2) prepared a key for separation of the seeds, a United States Department of Agriculture Handbook No. 30 (3) has a key for seed identification. However, characters are variable and very difficult to use under conditions and with dried specimens.

In a comparative study of the two species, ten selections of each species were grown in the greenhouse and in the field. In addition, many plants grown from seed were included as Journal Series No. 238. Received for publication April 11, 1953.

\footnote{\textsuperscript{1} Contribution from Georgia Agr. Exp. Sta., entered as Journal Series No. 238. Received for publication April 11, 1953.}