DWARF varieties of grain sorghum adapted to combine harvesting have become very popular within the past eight years in regions where the crop is extensively grown. Varieties suited for this purpose must possess strong stalks and peduncles to prevent the heads from breaking over, because the crop often has to stand in the field until late fall in order to dry sufficiently for satisfactory combining and safe storage.

One of the difficulties experienced in selecting dwarf grain sorghums adapted to combine harvesting has been to find varieties with peduncles strong enough to maintain heads in an upright position. The breaking over of heads has been assumed by most sorghum workers to be due to the combined effects of wind, moisture, and gravity, accentuated by a greater leverage in varieties having long peduncles. It has also been thought that the translocation of more carbohydrates from the stalks into the heads of certain dry-stalked types might be a differentiating factor in decreasing resistance to lodging.

Although all of the above suggested factors may be operative, the chief factor influencing the percentage of broken over heads is now believed to be due to a specific malady in the peduncles. Whether the causal factor is an organism or a non-parasitic breakdown of the tissues remains to be determined. This apparent diseased condition seems to interfere with the translocation of organic material to the grain as evidenced by the poorly filled heads associated with weakened peduncles. When the weakened plants are subjected to the elements, many of the heads are likely to be broken over. This condition was very apparent at Hays, Kans., in the fall of 1937 when the examination of hundreds of individual plants showed that weak peduncles were nearly always associated with badly disintegrated tissues.

Many data have been published on broken and weak corn stalks, but these may be related only indirectly to the problem here discussed. Pammel, King, and Seal in 1916 described a Fusarium disease of certain sorghum varieties as follows:

"When the Fusarium attacks sorghum, the canes break at the joints, sometimes beginning at the first joint; more frequently most of the joints are attacked. These readily break off. The roots are

1Results of investigation conducted cooperatively by the Division of Cereal Crops and Diseases, Bureau of Plant Industry, U. S. Dept. of Agriculture, and the Kansas Agricultural Experiment Station, Manhattan, Kans., at the Fort Hays Branch Experiment Station, Hays Kans. Contribution No. 26, Fort Hays Branch Experiment Station.

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