different rates. It can be noted that the amount of shattering appears to be the same as the estimated percent of head damage in Table 1. At the 5% level of significance, all treated plots shattered significantly higher than the untreated check. Yogo was significantly lower in the amount of shattering than the other three varieties. It may be of interest to point out that this varietal response corresponds to the known shattering resistance of Yogo in the absence of 2,4-D.

It is well to keep in mind that all plots were harvested when binder ripe. Perhaps greater shattering would have occurred if they had been harvested with a combine.

Conclusions

Under certain Central Montana conditions 2,4-D increased the shattering in winter wheat when sprayed at the early jointing stage. The degree of shattering was proportionate to the rate of 2,4-D applied. Yogo winter wheat was more tolerant to the shattering induced by 2,4-D treatments than other varieties in this test. A relationship between percentage of head abnormalities and shattering was evident.—JAMES L. KRALL, Assistant Agronomist, Central Montana Branch Station, Moccasin, Mont.

PRE-EMERGENCE CONTROL OF BERMUDA GRASS AND JOHNSON GRASS WITH 2,4-D

The control of weedy perennial grasses with rhizomes continues to be one of the most serious and expensive weed problems. Research directed toward finding more effective and more economical control is needed.

Bermuda grass (Cynodon dactylon) and Johnson grass (Sorghum halepense), like most other grasses, have proven to be resistant to the usual post-emergence applications of 2,4-D. Young cells have been found to be most susceptible to the chemical. Therefore, experiments using heavy applications of 2,4-D when the plant cells were principally in a meristematic stage were carried out in 1948 and in the spring of 1949.

Methods

Areas heavily infested with Bermuda grass and other areas heavily infested with Johnson grass were chosen. Principal parts. Prior to treatment with one part was burned, the second heavily disked, and in the third area the debris was left undisturbed. These areas were then divided and one series of plots sprayed prior to spring emergence. The second series was sprayed when approximately 50% of the...