MONTANA STATE UNIVERSITY
MONTANA AGRICULTURAL EXPERIMENT STATION

RESULTS OF AGRONOMIC AND WEED SCIENCE RESEARCH CONDUCTED IN SOUTH CENTRAL MONTANA - 2016

The Annual Report of the Investigations at and Administration of the
Southern Agricultural Research Center, Huntley, Montana

PROJECT TITLE: Dryland and Irrigated Spring Barley Early Yield Trials near Huntley, Montana. (Exps. 163108b and 163109b).

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OBJECTIVES: To evaluate the agronomic performance of experimental barley lines and existing barley varieties under dryland conditions. Also, to provide barley growers in south central Montana with a reliable, unbiased, up-to-date source of information that will permit valid comparisons among new experimental lines and existing barley varieties. This information should help barley producers select varieties best suited to their particular area and growing conditions.

METHODS: The 2016 dryland and irrigated spring barley Early Yield Trials both had 64 entries and were planted using an 8 x 8 partially-balanced lattice design with three replications. Dryland test plots consisted of a 15-foot, 4-row plot with 14-inch row spacing. Irrigated test plots consisted of a 15-foot, 7-row plot with 7-inch row spacing. All rows of each test plot in both trials were trimmed 36 inches and were harvested using an experimental-plot combine. Recorded grain yields were adjusted to 13% grain moisture content and are reported in bushels per acre (bu/ac) based on a 48-pound standard bushel weight. Test weight (pounds per bushel, lb/bu) and percent grain moisture content were obtained for each plot using a Dickey-john GAC 2100 grain analyzer. Percent plump and thin kernels were determined by measuring the amount of a 100-gram subsample retained above a 6/64" slotted screen and passing through a 5½/64" slotted screen, respectively, following 30 oscillations on a sieve shaker. Grain protein (%) was determined for each entry from all replications. Grain protein is reported on a 100% dry matter basis. Plant height was measured in inches from the soil surface to the top of the head, excluding the awns if present. Heading date was noted when 50% of the heads in a plot had extended out of the flag leaf. Heading dates were recorded in Julian days (number of days from January 1) for statistical purposes. Corresponding calendar dates also are presented.

RESULTS and SUMMARY: Unusually warm and dry conditions prevailed during the preceding fall and winter months at Huntley. Although conditions remained warmer than average during March, April and May of 2016, precipitation also was above average during those months. June growing conditions were much warmer than normal with less than average precipitation. Dryland barley yields in 2016 were approximately 34 percent lower than in in 2015, but protein increased by 36 percent. For irrigated conditions, yields had a more moderate decrease of approximately 25 percent as compared to 2015, and protein values were almost the same for both years.

Dryland Spring Barley Early Yield Trial (Exp. 16EYT08)

Agronomic performance of the spring barley cultivars and experimental lines tested during 2016 under dryland conditions near Huntley is presented in Table 1. Dryland barley yields averaged 72.7 bu/ac and ranged from 29.8 bu/ac for 'MT103101-5' to 101.1 bu/ac for '2B11-4949'. Two cultivars and 5 experimental lines yielded from 87.7 to 95.4 bu/ac, which were statistically equal to that of the highest yielding entry. Test weights averaged 50.0 lb/bu, and '11WA-107.58' had the highest test weight at 53.2 lb/bu. Fifty-five of the 64 entries in the dryland barley trial produced test weights greater than or equal to 48.0 lb/bu. Barley protein averaged 16.1 percent and ranged from 13.8 for 'MT124664' to 19.9 for 'MT103038-4'.

Irrigated Spring Barley Early Yield Trial (Exp. 16EYT09)

Agronomic performance of the spring barley cultivars and experimental lines tested during 2016 under irrigated conditions near Huntley is presented in Table 2. Irrigated barley yields averaged 81.7 bu/ac and ranged from 21.2 bu/ac for 'MT103101-5' to 116.3 bu/ac for 'MT080192'. Four experimental lines produced yields from 107.6 to 116.0, which were statistically equivalent to the highest yielding entry. Test weights averaged 52.0 lb/bu, and 'Haxby' had the highest test weight at 54.5 lb/bu. Sixty-one of the 64 entries in the irrigated trial had test weights greater than or equal to 48.0 lb/bu. Barley protein averaged 11.5 percent and ranged from 8.2 percent for '09MT-08' to 15.4 percent for 'MT103038-6' and 'MT103089-3'.

FUTURE PLANS:

On-station dryland and irrigated spring barley Early Yield Trial evaluations will continue in 2017 at the Southern Agricultural Research Center.