MONTANA STATE UNIVERSITY
MONTANA AGRICULTURAL EXPERIMENT STATION

RESULTS OF AGRONOMIC AND WEED SCIENCE RESEARCH CONDUCTED IN SOUTH CENTRAL MONTANA - 2014

The Annual Report of the Investigations at the
Southern Agricultural Research Center, Huntley, Montana
http://www.sarc.montana.edu/

PROJECT TITLE:

Impact of dormant seeding on winter wheat and spring wheat performance in south central Montana. This research is partially supported by Montana farmers through the Montana Wheat and Barley Committee.

PROJECT LEADERS:

Kent A. McVay, Cropping System Specialist, SARC, Huntley
Qasim A. Khan, Research Associate, SARC, Huntley

PROJECT PERSONNEL:

Tom A. Fischer, Research Specialist and Farm Foreman, SARC, Huntley
Janna Kransky, Research Assistant III, SARC, Huntley
Steve Lackman, Yellowstone County Extension, Billings

OBJECTIVES:

Dormant seeding of winter wheat sometimes occurs when dry fall soil conditions persist into the onset of winter. Spring seeded crops can also be dormant seeded when soil conditions are favorable prior to spring warm-up. There is little information on the performance of currently available wheat cultivars managed as dormant seeded crops. Our objectives were to evaluate both spring wheat and winter wheat cultivars planted at intervals from late fall to early spring.

METHODS:

The test location was a sprinkler irrigated field (Field A) on the Southern Agricultural Research Station. The previous crop was spring barley. The area was conventionally tilled prior to planting. Test plots were 15-foot long, 4 row plots with 11-inch spacing. Planting dates were 10/24/2013, 1/28/2014, 4/22/2014, and 5/20/2014. Winter wheat varieties were Bearpaw and Yellowstone. Spring wheat varieties were Choteau and Vida.

All rows of each test plot were trimmed 36 inches and harvested using an experimental plot combine. Recorded grain yields were adjusted to 13% grain moisture content, and are reported in bushels per acre (bu/a) based on a 60 pound standard bushel weight. Test weight (lb/bu, pounds per bushel) and grain moisture content (%, percent) were obtained for each plot using a Dickey-John™ GAC 2100 grain analyzer. Grain protein (%, percent) was estimated using near infrared spectroscopy. Reported grain protein values are adjusted to 12% grain moisture content.

RESULTS:

The late October planting provided adequate time for emergence but only provided a spike with little to no plant establishment prior to freeze-up which occurred nearly a month later. Surprisingly the spring wheat varieties survived and provided the best yields of all planting dates. A window of warmer temperatures and clear field conditions occurred in late January which allowed a second planting date (See SARC Climatic Summary). At this time the drill successfully cut through the soil and the seeds were covered adequately, but were left sitting in a dry, cold seedbed and germination did not occur until spring. The wet early spring of 2014 prevented field entry for a third planting until mid-April. The final planting was May 20.

Best yields of spring wheat were from the October planting date (Table 2). The yield drop for the January seeding date as compared to the October date was unexpected. The difference could be because that plant establishment for the January planting did not occur until spring thaw, likely in early March. Later plantings resulted in even lower yields.

Winter wheat yields, as expected, were best with the October seeding date where the plants were established prior to freeze-up (Table 3). Seeds from the January seeding date likely did not germinate until early March, yet temperatures after germination were apparently adequate for vernalization, as seed was produced similar in timing to the October planting. The later spring plantings were too late for vernalization to occur, and no viable seed was produced.

SUMMARY:

This trial represents just one year of data at one location. No broad conclusions about the success or failure of dormant seeding can be made at this time. Evaluation of dormant seeding practices should be continued in coming years.

Table 1. Management data for dormant seeding trial, Huntley MT 2014.

Planting dates 1-4 were 10/24/2013, 1/28/2014, 4/22/2014, and 5/20/2014 respectively
Harvested: August 18, 2014
Fertility: 175 lbs N/acre in Spring 2014 as 46-0-0
Herbicide: Huskie @ 12 oz/acre = Rimfire @ 2 oz/acre on May 12, 2014
Insecticide: none
Previous crop: spring barley
Irrigation: overhead sprinkler
Precipitation: 9.7 inches

Table 2. Performance of spring cultivars in a dormant seeding trial under limited irrigation near Huntley, MT 2014.

	Planting Date*	Yield (bu/a)	Test Weight (lb/bu)	Protein (%)
Choteau	1	94.7	58.7	15.5
	2	72.2	56.9	16.1
	3	34.2	57.0	16.1
	4	24.9	58.2	16.1
Vida	1	79.3	58.4	16.6
	2	71.8	56.3	16.8
	3	32.2	56.6	16.3
	4	29.1	57.8	16.3
Mean		63.9	57.2	15.6
PLSD (0.05)		7.7	1.0	0.4
CV (%)		12.9	1.6	2.1

*See Table 1.

Table 3. Performance of winter cultivars in a dormant seeding trial under limited irrigation near Huntley, MT 2014.

	Planting Date*	Yield (bu/a)	Test Weight (lb/bu)	Protein (%)
Bearpaw	1	86.9	56.1	13.9
	2	53.1	54.1	15.4
Yellowstone	1	109.0	58.4	13.7
	2	79.9	58.2	14.5
Mean		63.9	57.2	15.6
PLSD (0.05)		16.7	1.0	0.5
CV (%)		16.6	1.40	2.67

*See Table 1. Note: planting dates 3 and 4 were established but little to no grain was produced.