

RESPONSE OF HARD RED SPRING WHEAT, BARLEY, AND OATS TO CAROLINA DAKOTA SEED COATING

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Summary:

Carolina Dakota seed coating is a starch based water absorbent material which is suggested to promote germination, improve stands, and increase yield of small grains. This seed coating was tested at Hettinger and Dickinson using Marshall wheat, Azure barley, and Steele oat under both unfertilized and fertilized with nitrogen conditions to determine if it had any effect on yield, test weight, or stand establishment of the small grains. Results at Hettinger showed Carolina Dakota seed coating had no significant effect on yield, test weight or stand establishment of Marshall wheat or Steele oat and had no effect on test weight or stand of Azure barley but significantly decreased yield of Azure barley under both fertilized and unfertilized conditions. Results at Dickinson showed no significant effect on yield or test weight of any small grain due to the seed coating or soil fertility.

Introduction:

Carolina Dakota seed coating is composed of a starch based water absorbent material and graphite which promotes adhesion to the seed. The coating has a high affinity for water and draws water from the surrounding soil for concentration around the seed. It is claimed to promote germination and stand establishment in small grains, especially under relatively dry soil conditions. This theory was tested using Marshall wheat, Steele oat, and Azure barley. A nitrogen fertility variable was included to determine if crop response was different under a higher nitrogen fertility regime.

Experiment Procedure:

A split plot design with four replications was used to test for differences between treated and untreated seed of Marshall wheat, Steele oats, and Azure barley. Seed was treated at a rate of 1 pound seed coating per 100 pounds of seed. Seeding rates were 1,000,000 live seeds per acre for wheat (approx. 1 bu. / ac.), and 750,000 live seeds per acre for oats and barley (approx. 1.5 bu. / ac. oat and 1.3 bu. / ac. barley). Sixty pounds of 18-46-0 was broadcast applied to all main plots which served as the fertilizer variable.

The Hettinger trial was planted on April 16th and stand counts were taken prior to tillering. Plots at Hettinger were harvested August 8th. Dickinson's trial was planted May 21st and harvested August 16th.

Results and Discussion:

A heavy snowfall occurred 10 days after planting at Hettinger which provided very moist germinating conditions upon melting. Since moisture for germination was readily available, the effects of the seed coating may have been minimized. The site at Dickinson was moderately dry at planting. Table 39 shows yield, test weight, and plant population results for the study at Hettinger. Results at Dickinson

appear in Table 40. Use of the seed coating did not significantly increase yield, test weight, or plant population of Marshall wheat or Steele oats at Hettinger. Soil fertility had no effect on this response. A significant decrease in yield was observed with Azure barley at Hettinger when treated with the seed coating under both fertility treatments. The Dickinson trial showed no significant effect on yield or test weight of Marshall wheat, Steele oats, or Azure barley due to the seed coating.

Results of this study are 1st year results only. An additional 2 years testing will be conducted at both sites to compile more data before firm conclusions are drawn relative to Carolina Dakota seed coating.

Table 39. Yield, Test Weight, and Plant Population of Marshall Wheat, Steele Oat, and Azure Barley as Affected by Carolina Dakota Seed Coating and Nitrogen Fertility, Hettinger 1984

NO = Unfertilized

N1 = Fertilized

TO = Untreated

T1 = Treated

NS = No significant difference (P = .05)

Variety	Treatment		Yield Bu / Ac	Test Weight Lbs / bu	Plants / Acre X 1000
Marshall	NO	TO	36.7	59.1	573
Marshall	NO	T1	37.2	59.3	660
Marshall	N1	TO	43.1	59.1	759
Marshall	N1	T1	46.0	59.1	629
F TRT			NS**	NS	NS
Steele	NO	TO	66.5	34.5	511
Steele	NO	T1	67.5	34.7	554
Steele	N1	TO	75.0	34.7	585
Steele	N1	T1	66.1	34.5	542
F TRT			NS	NS	NS
Azure	NO	TO	46.1	46.5	616
Azure	NO	T1	40.5	46.0	579
Azure	N1	TO	57.5	46.3	641
Azure	N1	T1	46.4	46.1	660
F TRT			7.04*	NS	NS

* Significant difference (95% confidence level) in yield due to seed treatment.

** No significant difference due to seed treatment or addition of nitrogen to the soil.

Summary of Results at Hettinger:

1. Use of the seed coating did not significantly increase yield, test weight, or plant population of Marshall wheat or Steele oats. Soil fertility had no effect on this response.
2. A significant decrease in yield was observed with Azure barley when treated with the seed coating under both fertility treatments.

Table 40. Yield and Test Weight of Marshall Wheat, Steele Oat, and Azure Barley as Affected by Carolina Dakota Seed Coating and Nitrogen Fertility, Dickinson, 1984

NO = Unfertilized

N1 = Fertilized

TO = Untreated

T1 = Treated

NS = No significant difference (P = .05)

Variety	Treatment		Yield Bu / Ac	Test Weight Lbs / bu
Marshall	NO	TO	34.2	59.3
Marshall	NO	T1	33.1	59.0
Marshall	N1	TO	34.5	58.8
Marshall	N1	T1	33.3	59.3
F TRT			NS*	NS
Steele	NO	TO	64.7	36.0
Steele	NO	T1	65.9	35.3
Steele	N1	TO	62.1	36.0
Steele	N1	T1	59.2	39.3
F TRT			NS	NS
Azure	NO	TO	52.5	48.0
Azure	NO	T1	53.8	49.0
Azure	N1	TO	51.2	47.5
Azure	N1	T1	48.7	46.5
F TRT			NS	NS

* No significant difference due to seed treatment or addition of nitrogen to the soil.

Summary of Results at Dickinson:

1. The Dickinson trial showed no significant effect on yield or test weight of Marshall wheat, Steele oats, or Azure barley due to the seed coating or soil fertility.