

I. PROJECT TITLE: Evaluation of winter wheat, spelt and triticale, yield, percent protein and protein quality, MSU and NDSU study.

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IV. OBJECTIVES: To compare the yield and quality of alternate cereals, triticale and spelt, to common bread wheat, when grown in trials representing a range of environments in the northern great plains cropping regions. Often alternative cereals are advertized to be significantly higher in quality than common bread wheat, however, data is lacking to support these claims. This study will generate data from the cereals grown together in trials under a range of environments, under dryland cropping.

V. RESULTS: Only the yield and percent survival data are available for this report. The data on percent protein of both hulled and de-hulled spelt, and protein quality (amino acid composition) will be reported when chemical analysis has been completed. The trials were grown successfully at four sites in Montana and three sites in North Dakota. The Montana trial at Moccasin was blown out, with only a few selections surviving, while all winter cereal trials were winter killed at Dickenson, and the trial abandoned at Minot due to extremely high wild oat pressures, however, the North Dakota trials at Williston, Carrington, and Fargo were successful.

The yield and percent survival data for the North Dakota trials are described in Table 1, and the Montana data described in Table 2.

In North Dakota, total yields (weight in lbs/Acre) were not significantly different among the cereal varieties tested, with the exception of the Fargo site, which had significantly low yields of Pika and B0010 triticale, and Vita II spelt. In Montana, yields were similar among the cereals at the Billings and Havre sites, while at the Huntley site, the triticale varieties B0010 and Pika, and the Sindelar GR900, and Alt-Gold were significantly lower when compared to Tiber winter wheat. The yields of winter wheat and triticale and Sindelar spelt were similar at Sidney. Vita II spelt had only a 10% survival and yield one fourth that of the other varieties, while GR900 and Alt-Gold spelt selections did not survive at Sidney.

Yield ranges (in bushels) of wheat in Montana ranged from 68.2-41.5, and from 35.7-27.6 in North Dakota, triticale yields ranged from 84.3-30.6 in Montana and 52.0-10.0 in North Dakota, while spelt yields (based on a 32 lb bushel) ranged from 128-37.4 in Montana, and 76-28.3 in North Dakota.

VI. SUMMARY: Yields of triticale and spelt compared favorably to winter wheat varieties at many of the test sites, indicating that the selected cultivars were adapted in many locations. However, the spelt selections were hit hard by winter kill at the Sidney site, and several triticale and spelt cultivars did not yield well at the Fargo site. The range in yields and geographic distribution of sites should generate new and useful data on protein and protein quality comparisons among the cereal crops.

VII. FUTURE PLANS: Once the chemical analysis has been completed and analyzed, the data will be published. This was a one year specific study.

Table 1. Yield and percent survival of winter wheat, spelt and triticale at three Research Centers in North Dakota.

|                           | Williston |      | Carrington |      | Fargo |      |
|---------------------------|-----------|------|------------|------|-------|------|
|                           | Yield     | %    | Yield      | %    | Yield | %    |
|                           | Lb/A      | Surv | Lb/A       | Surv | Lb/A  | Surv |
| MT 7811 HWWW <sup>1</sup> | 1957      | 40   | 1851       | 90   | 1703  | 73   |
| Roughrider HRWW           | 2140      | 47   | 1653       | 95   | 1903  | 80   |
| Presto Triticale          | 2063      | 42   | 2596       | 88   | 1274  | 66   |
| B0010 Triticale           | 2232      | 42   | 2008       | 92   | 895   | 73   |
| Pika Triticale            | 2177      | 63   | 1537       | 93   | 473   | 75   |
| Sindelar Spelt            | 1883      | 68   | 1461       | 70   | 1255  | 70   |
| Vita II Spelt             | 2268      | 58   | 1590       | 58   | 906   | 75   |
| GR 900 Spelt              | 2218      | 63   | 1857       | 68   | 1576  | 72   |
| Alt-Gold Spelt            | 2434      | 70   | 2115       | 77   | 1242  | 80   |

<sup>1</sup> MSU Variety licensed exclusively to Western Plant Breeders, Bozeman, MT

Table 2. Yield and percent survival of winter wheat, spelt and triticale at four locations in Montana.

|                              | Huntley       |           | Billings      |           | Havre         |           | Sidney        |           |
|------------------------------|---------------|-----------|---------------|-----------|---------------|-----------|---------------|-----------|
|                              | Yield<br>Lb/A | %<br>Surv | Yield<br>Lb/A | %<br>Surv | Yield<br>Lb/A | %<br>Surv | Yield<br>Lb/A | %<br>Surv |
| MT 7811 <sup>1</sup><br>HWWW | 2494          | 100       | ---           | ---       | 3773          | 99        | 4094          | 68        |
| Tiber HRWW                   | 2733          | 100       | 2771          | 100       | 3837          | 99        | 3959          | 74        |
| Presto<br>Triticale          | 2674          | 100       | 3394          | 100       | 4957          | 98        | 3967          | 63        |
| B0010<br>Triticale           | 1630          | 100       | 3249          | 100       | 4217          | 97        | 4951          | 73        |
| Pika<br>Triticale            | 1529          | 100       | ---           | ---       | 3047          | 96        | 4187          | 85        |
| Sindelar<br>Spelt            | 1589          | 100       | 2279          | 100       | 3283          | 82        | 3317          | 61        |
| Vita II<br>Spelt             | 2025          | 100       | 2722          | 100       | 4093          | 72        | 1198          | 10        |
| GR 900 Spelt                 | 1985          | 100       | 2757          | 100       | 3403          | 65        | 0             | 0         |
| Alt-Gold<br>Spelt            | 2022          | 100       | 2627          | 100       | 3720          | 79        | 0             | 0         |

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