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PROJECT TITLE: SMALL GRAIN VARIETY PERFORMANCE UNDER NO-TILL CONDITIONS AT TWO FERTILIZER LEVELS.

PROJECT LEADER: R. Berg; Havre, MT

PROJECT PERSONNEL: L. Talbert, Coordinator - Spring Wheat
T. Blake, Coordinator - Barley
P. King, NARC Research Technician
R. Spicher, Cooperating Landowner

OBJECTIVES: To evaluate small grain varieties regarding their suitability for no-till recrop production with low and high fertilizer inputs in northern Montana fields.

RESULTS:

This marked the second year that variety performance with low and high levels of fertilizer were examined to determine baseline responses and measure the sustainability of no-till small grain cropping systems. Four off-station dryland small grain nurseries were established in Hill County testing 20 spring wheat and 15 barley varieties with two nurseries per crop, one with and one without N, P, and K fertilizer applied at planting. All nurseries were established on the Rob and Daryl Spicher farm southwest of Hingham on a location similar to that used for no-till recrop variety and fertilizer trials conducted since the mid 1980s by Northern Agricultural Research Center. These trials are designed to test the main effects of crops, varieties, fertilizer application, and relevant interactions among crops that might suggest which germplasm was best suited for low to medium and high nutrient field environments.

Soil, climatic, and management information, are summarized in Table 1. Limited winter precipitation restricted stored soil moisture to levels that were borderline for recropping. Soil tests indicated that responses to fertilizer N, Zn, and possibly K might be expected if adequate moisture was available. Seed was sown into moderately moist soil but eventually succumbed as drought continued throughout the spring and early summer.

A calibration error during the first year of this project (spring, 1991) was discovered after the publication of last year's report. This resulted in a discrepancy for N and K rates applied to two of the four nurseries presented in a portion of this project's document. Actual rates applied to nurseries that received fertilizer were 30 lb/ac each for N and K2O (rather than 60 lb/ac as mentioned in Table 1 that year). Whereas this does not affect the data reported in Tables 2 to 5, it does modify estimated yield goals anticipated at the beginning of the season as well as economic feasibility calculations discussed within the text.

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SUMMARY:

These research trials were established and total precipitation in the area was normal or above. Unfortunately it arrived in July and August and was too late for these nurseries. Cereal crops in nearby no-till recrop fields established by the producer also failed this year.

FUTURE PLANS:

This research will not be continued. Severe budget and personnel cuts targeted for the Montana Agricultural Experiment Station and other state agencies mandated during two special legislative sessions last year caused permanent termination of staff at Havre associated with this project (faculty project leader and technician).

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TABLE 1. SOIL, CLIMATIC, AND MANAGEMENT INFORMATION FOR NO-TILL RECROP SMALL GRAIN VARIETY NURSERIES. NORTHERN AGRICULTURAL RESEARCH CENTER. HAVRE, MT. 1991.

ITEM DESCRIPTION

SOIL ANALYSIS (0-6" EXCEPT SOIL NO3-N & WATER ALSO @ 6-12" & 12-24"):
 PH 7.7
 ORGANIC MATTER (%) 1.0
 NO3-N (LB/AC) 13
 OLSEN P (PPM) 17
 AVAIL. K (PPM) 264
 SO4-S (PPM) 26
 NA (MEQ/100 G) 0.15
 EC (MMHOS/CM) 0.64
 ZN (PPM) 0.2
 DEPTH TO LIME 0 TO 6" (V)

SOIL TAXONOMY: TELSTAD/JOPLIN (FINE-LOAMY, MIXED ARIDIC ARGIBOROLL)
 HILTON [FINE-LOAMY, MIXED (CALCAREOUS), FRIGID USTIC TORRORTHEMITS]

PRECIPITATION (INCH) 1.1
 03-27-92 TO 06-20-92 1.1 (TERMINATED)
 SOIL SAMPLE TO BUNDLE HARVEST NA
 BUNDLE TO GRAIN HARVEST NA
 GRAIN HARVEST TO SOIL SAMPLE NA

WATER STORED IN SOIL PROFILE TO 2 FT.
 AT PLANTING (INCH) 2.6
 AT HARVEST (INCH) NOT DETERMINED

PREVIOUS CROP: SPRING WHEAT
 SEEDING DEPTH: 1.50 INCHES
 SEEDING RATES (LB/AC): 65 (WHEAT), 55 (BARLEY)
 GRAIN YIELD (BU/AC) STANDARDIZED TO: 60 (WHEAT)/48 (BARLEY) LB/BU TEST WEIGHT
 DRILL: USDA III YIELDER WITH PAIRED ROW SPACING (5" X 15")
 FERTILIZER: 30 LB N/AC (46-0-0, DEEP BANDED), 30 LB P2O5/AC (0-45-0, BANDED WITH SEED), AND 30 LB K2O/AC (0-0-62, DEEP BANDED) AT PLANTING FOR TRIALS THAT RECEIVED FERTILIZER
 WEED CONTROL: PREPLANT = LANDMASTER (54 OZ/AC)
 POSTEMERGE = NONE

SOIL SAMPLE MARCH 27
 SEEDING DATE APRIL 23
 POST-EMERGENCE HERBICIDE DATE NONE
 BUNDLE HARVEST DATE NONE
 GRAIN HARVEST DATE NONE
 FALL SOIL SAMPLE DATE NONE

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