

Oakes Irrigation Research Site  
Irrigated Barley Variety Trial -2006

INTRODUCTION

Most malting barley is grown under irrigation in the Western states. Irrigation allows producers to achieve yield goals resulting in better N utilization and improved quality. Historically barley has played a significant role in the agriculture of central and eastern North Dakota as a cash crop that fits well into the rotation. Recently a perception exists that barley, especially malting barley, is not a viable crop in this area of the state due to disease, low yields, low price and quality considerations. It is generally not considered as a crop to be grown under irrigation.

In reality, production numbers, economic analysis of farm producers and current research on barley production show a different picture. The USDA North Dakota Agriculture Statistics Service shows that from 2000-2004 the north central, central and southeast (excluding Richland and Sargent Counties) regions produced 35,974,000 bushels of barley annually, which is 40% of the barley produced in North Dakota. The statistics for 2005 show this area of the state producing 41% of the state's barley. The counties in these regions closely follow the area of the state served by the Carrington Research Extension Center. Steve Metzger, Instructor/ Coordinator of the Carrington Area Farm Business Management Program in a report entitled: A Review of Crop Production Costs, Yields and Returns for South-Central North Dakota for the Years 2001-2005, showed barley to provide higher returns than other crops. Barley, oil sunflower, soybean, HRSW and corn provided returns (including estimated government payments) of 52.17, 43.82, 41.29, 26.23 and 20.45 \$/ac, respectively. Intensively managed barley variety trials at the Carrington Research Extension Center support this, as six- and two-row varieties under dryland have averaged 90.1 and 73.0 bushels/ac from 2004-2006. Irrigated six- and two-row varieties at this site have averaged 109.0 and 103.1 bu/ac. Protein levels for dryland and irrigated barley have averaged 12.2% and 11.9% for dryland and irrigated barley from 2004-2006. Plump kernels averaged 68% and 83% for dryland and irrigated barley in 2006. Barley production in central North Dakota along with our research results show barley to be a profitable crop. Barley performance in the 2006 trial reflects the potential for irrigated barley as newer six-row varieties such as Stellar-ND and Tradition averaged 128 bushels/ac, 82% plump, 11.8% protein, and 0 ppm DON.

OBJECTIVE:

The objective of this study is to find barley varieties that are viable in irrigated cropping systems in Southeastern North Dakota and to develop and demonstrate agronomic practices that promote barley production.

MATERIALS AND METHODS

Four barley varieties were planted on April 13, in a randomized complete block design at 2.8 bu/ac (1,320,000 seeds/ac). Pre-plant soil sampling showed 29 lb nitrate-N/ac at the 0-24 inch depth. Post harvest soil sampling showed 36 lb nitrate-N/ac at the 0-24 inch depth. Prior to planting 70, 45, 52 and 13 lb/ac of N P<sub>2</sub>O<sub>5</sub>, K<sub>2</sub>O and S were incorporated. Nitrogen at 30 lb/ac was stream-bared as 28-0-0 on May 15. Weeds were controlled with 1.2 pt/ac of Wolf Pak on May 13 and 0.4 pt/ac of Puma on May 15. Headline at 6 oz/ac was applied at Feekes 4.5. Tilt at 4 oz/ac was applied at Feekes 8 and 4 oz/ac of Folicur at Feekes 10.5. Barley plots were harvested on July 23. Yield and agronomic measurements for varieties are shown in Table 1.

Table 1. Yield and agronomic characteristics in an irrigated barley variety trial at the Oakes Irrigation Research Site at Oakes, ND in 2006.

Barley - Irrigated							Oakes
Variety	Heading date	Plump %	Thin %	Test Weigth lb/bu	Protein %	Height inch	Yield bu/ac
Drummond	8-Jun	97.6	2.2	47.3	10.0	39.6	112.2
Tradition	11-Jun	97.4	2.0	48.0	9.2	39.1	113.6
Lacey	7-Jun	98.0	1.9	48.8	9.3	38.5	116.6
Stellar-ND	9-Jun	97.6	1.9	47.2	9.5	38.8	117.1
Mean	8-Jun	97.6	2.0	47.8	9.5	39.0	114.9
C.V. %		0.7	28.1	0.7	1.8	2.1	2.7
LSD .05		NS	NS	0.6	0.3	NS	NS

## RESULTS

Yield was not significantly different between varieties. Lodging which is usually a serious problem in irrigated barley in southeastern North Dakota was not evident in 2006. Warm dry weather and conservative N application were factors that helped limit lodging. A high percentage of plump kernels, good test weight and low protein show high quality malting barley at profitable yield levels.