ABSTRACT

Four winter beardless barley varieties (Henry, Maury, Sussex, and Wysor) were compared in replicated single row plots with Stephens soft white winter wheat for winter survival in 1986-87. The test was conducted at the Central Oregon Experiment Station Madras research site. The winter was too mild to evaluate winter hardiness but other useful information was collected. Field emergence of Henry and Maury were similar but significantly better than Sussex, Wysor, and Stephens. At harvest Henry and Maury were taller than Sussex and Stephens. The barley varieties were about three weeks earlier than Stephens wheat. No difference in dry matter yield existed among the four barley varieties. Stephens was not harvested.

INTRODUCTION

Varieties of barley, oats, rye, and wheat have been used for hay in Central Oregon for many years. However, with the current farm program there has been increased interest in the use of cereals for forage, including beardless barleys. To date very few varieties of beardless barley are available. Belford, a six-row hooded spring barley, has been most frequently used (1). Only recently have other winter type forage barleys been identified but their adaptability under various winter climates has not been fully evaluated. Therefore, the Station joined the Oregon program to assist in data collection for a determination of adaptability range. The information could also be useful to local forage producers.

MATERIALS AND METHODS

A single row of Henry, Maury, Sussex, and Wysor winter beardless barley, and Stephens soft white winter wheat were planted November 3, 1986 at the Station's Madras site. The four winter barley cultivars were developed by breeders at the Virginia Polytech Institute. All are early maturing,
lodging resistant and susceptible to scald. Sussex is the earliest heading of the four.

Each variety was replicated four times in a randomized complete block design. Each plot was three feet wide by 12.5 feet long with the row in the center. One hundred and fifty seeds of each variety were sown 1.5 inches deep and one inch apart in the row. Stephens winter wheat was included as a check for winter hardiness.

A top dressing of 16-20-0 NPK at a rate of 500 lbs/A was applied April 8, 1987. The trial was irrigated as needed. No herbicides, fungicides, or insecticides were applied.

Data were collected on field emergence (number of plants April 8 divided by 150 seeds sown per plot x 100) relative maturity, plant height on June 12, and yield on June 12 for the barley varieties. About 500 grams of green forage was taken from each plot at harvest and dried at 155° F from which dry matter yields were calculated. Data were analyzed statistically.

RESULTS AND DISCUSSION

Due to the late planting date and fall/winter environmental conditions complete emergence of seedlings did not occur until spring. However, on December 18, 1986 each variety was ranked from most to least for number and height of seedlings as follows: Stephens, Henry, Sussex, Wysor, and Maury. The seedlings were approximately two inches tall. On April 8, 1987 field emergence was 91.3 and 96.2% for Henry and Maury, respectively (Table 1). They were similar for this trait but Maury had significantly more plants than Sussex, Wysor, and Stephens wheat. At this time the tillers of the barley cultivars were more prostrate and occupied a larger diameter than Stephens wheat. According to Feekes growth stage scale the barley was in stage three compared to a four for the wheat. The average tiller length from tiller base to the tip of the longest leaf was five inches for Maury, Henry, and Wysor; 7.5 for Sussex, and 8.5 inches for Stephens. These measurements were made on replication one only and the data were not analyzed statistically. There also appeared to be more tillers on the wheat plants than on the barley plants. By May 5th height differences were clearly visible. Cultivar rankings were Sussex, Wysor, Henry, Maury, and Stephens from tallest to shortest. Barleys were in growth stage 8 compared to only a 5-6 for Stephens wheat.

Maturity differences could be readily observed between barley and wheat. All barley cultivars had reached anthesis by May 18 but Maury appeared to be 2-3 days later since fewer anthers were visible. Anthesis did not occur on Stephens
until June 10. Therefore it appears that the barleys are about three weeks earlier than Stephens wheat.

The barley varieties reached soft dough stage on June 12. Henry and Maury were significantly taller than Sussex and Stephens at this time (Table 1).

Dry matter yield was similar for all barley varieties. The average yield was 4.2 tons/A. Murphy (1) found that the two year average hay yield of Belford barley at Redmond in mass seeded plots was 4.3 tons/acre. One might expect a higher yield from the winter beardless barleys at Madras if they were sown in 6-8 inch rows. However the question still exists, do these winter barleys possess sufficient winter hardiness for production in Central Oregon? If they do, then additional evaluations are needed to compare their value to spring oats which are traditionally grown for hay in the area. The highest oat hay yields from tests at Redmond ranged from 6.5 - 7.9 tons of dry hay per acre (1,2). Perhaps winter barley could also be grazed. The early harvest of winter barley may allow for double cropping.

Additional research is suggested for winter barley and other cereals for Central Oregon forage-livestock systems. Producers may benefit from planting certain species/cultivar mixtures or sowing cereals in established pastures by no-till methods as summarized by Horn (3). Interseeding of cereals and legumes or mixtures of each in which winter beardless barley could be a component may provide forage of improved nutritive value as well as yield.

REFERENCES


Table 1. Winter beardless barley test at Madras, Oregon 1986-87

<table>
<thead>
<tr>
<th>Variety</th>
<th>Field emergence (%)</th>
<th>Ht. (in)</th>
<th>Dry Matter yield (T/A)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Henry</td>
<td>91.3</td>
<td>43</td>
<td>4.3</td>
</tr>
<tr>
<td>Maury</td>
<td>96.2</td>
<td>43</td>
<td>4.0</td>
</tr>
<tr>
<td>Sussex</td>
<td>87.8</td>
<td>39</td>
<td>4.3</td>
</tr>
<tr>
<td>Wysor</td>
<td>88.2</td>
<td>41</td>
<td>4.3</td>
</tr>
<tr>
<td>Stephens$^2$</td>
<td>83.5</td>
<td>40</td>
<td>---$_3$</td>
</tr>
<tr>
<td>Mean</td>
<td>89.4</td>
<td>41</td>
<td>4.2</td>
</tr>
<tr>
<td>LSD (5%)</td>
<td>7.2</td>
<td>2</td>
<td>0.3</td>
</tr>
<tr>
<td>CV (%)</td>
<td>5.2</td>
<td>4</td>
<td>4.6</td>
</tr>
</tbody>
</table>

1 Percent field emergence = \( \frac{\text{no. of plants April 8, 1987}}{\text{no. of seeds planted Nov. 3, 1986}} \times 100 \)

2 Stephens winter wheat as a check for winter survival.

3 Stephens was not harvested.