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Certified seed does not cost—it pays!
Flora: A Winter Triticale
R. S. Karow and M. Kolding

Triticale is a "new" crop to many growers. In this publication, we will review some of the potentials and problems of triticale as a group and introduce Flora, a new triticale variety developed by Oregon State University.

A brief history of triticale
Triticale is a product of modern crop breeding. It is the hybrid progeny of crosses made between wheat (genus Triticum) and rye (genus Secale). The goal in making wheat-rye hybrids is to combine the high yield and high seed protein content of wheat with the broad adaptability and higher lysine content of rye.

Such crosses were first successfully made in the 1870s, but the resulting offspring were sterile. Fertile progeny were produced in the late 1930s, and serious research efforts began in the 1950's. Today, triticale is grown on about 2 million acres around the world, offering new food and feed resources.

Triticale has a broad genetic base and vary dramatically in plant characteristics. Some are very wheatlike, but others exhibit more of the rye parent features. Because of their unusual genetic background, triticale varieties will vary significantly in their adaptability and in grain quality.

In the past, triticale has been frowned on in some parts of the Pacific Northwest. Growers saw triticale as just another type of rye that was likely to become a weed problem in fields where it was grown. Indeed, this may be true.

At maturity, triticales will exhibit some characteristics of both parents. Barleys and wheats also shatter, but their volunteer progeny are often hidden in subsequent crops. Newer triticales have a shatter rate similar to currently grown wheat and barley varieties, and similar cultural practices can be used to control volunteers.

In general, cultural practices for triticale are identical to those for wheat and barley.

Oder triticales are tall and are susceptible to lodging. Extensive breeding efforts are producing new semidwarf, lodging-resistant varieties.

Flora
One of the new generation of triticales, Flora is a rough-awned, semidwarf, winter food triticale released by Oregon State University. Like other triticales, it is a hybrid containing both rye and wheat genetic material. Flora has had excellent yield in high-production areas of Oregon and Idaho.

Areas of adaptation
Flora is adapted to the high-rainfall intermountain valleys and plateaus of eastern Oregon, to irrigated areas in the Columbia and Redmond-Madras Basins and Treasure Valley, and to irrigated areas in Idaho and Washington. Flora is not adapted to low-rainfall, summer-fallow sites (be the yield and quality are poor under such conditions).

Flora is not recommended for use on poorly drained soils of western Oregon and Washington.

Table 1—Yield information for Flora triticale and Stephens wheat over several years and sites (in bushels per acre)

<table>
<thead>
<tr>
<th>Variety</th>
<th>Location</th>
<th>1980</th>
<th>1981</th>
<th>1982</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flora</td>
<td>Hermiston</td>
<td>109</td>
<td>136</td>
<td>108</td>
<td>110</td>
</tr>
<tr>
<td></td>
<td>Madras</td>
<td>103</td>
<td>103</td>
<td>104</td>
<td>104</td>
</tr>
<tr>
<td></td>
<td>Ontario</td>
<td>126</td>
<td>124</td>
<td>87</td>
<td>106</td>
</tr>
<tr>
<td></td>
<td>Pendleton</td>
<td>28</td>
<td>92</td>
<td>80</td>
<td>90</td>
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<tr>
<td></td>
<td>Union</td>
<td>94</td>
<td>94</td>
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<td>94</td>
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<tr>
<td></td>
<td>Average</td>
<td>109</td>
<td>109</td>
<td>109</td>
<td>109</td>
</tr>
<tr>
<td>Stephens</td>
<td>Hermiston</td>
<td>33</td>
<td>86</td>
<td>142</td>
<td>114</td>
</tr>
<tr>
<td></td>
<td>Madras</td>
<td>—</td>
<td>—</td>
<td>78</td>
<td>78</td>
</tr>
<tr>
<td></td>
<td>Ontario</td>
<td>100</td>
<td>147</td>
<td>152</td>
<td>132</td>
</tr>
<tr>
<td></td>
<td>Pendleton</td>
<td>39</td>
<td>66</td>
<td>64</td>
<td>55</td>
</tr>
<tr>
<td></td>
<td>Union</td>
<td>—</td>
<td>—</td>
<td>59</td>
<td>59</td>
</tr>
<tr>
<td></td>
<td>Average</td>
<td>57</td>
<td>99</td>
<td>104</td>
<td>135</td>
</tr>
</tbody>
</table>

Note: Yields are adjusted to 12.5% moisture. Flora yields are significantly lower than those for other common wheat varieties in tests conducted near Hermiston, Oregon. In addition, frost heaving has been a problem in Flora stands than in those of other common wheat varieties.

Performance
Yield. Over 5 years of testing at Hermiston and Ontario, Flora has yielded 14 bushels less than Stephens. In several years, Flora outyielded Stephens by as much as 31 bushels per acre. In tests conducted at Pendleton, Oregon, Flora has outyielded Stephens, on average, by 5 bu/A. Table 1 presents yield data over several years and sites.

Kernel quality. Triticales tend to produce lightweight, slightly wrinkled seed. This is no exception. Flora test weights have averaged around 42 lb/bushel, but they have been as high as 48 lb/bushel as kernels are large and shriveled in appearance.

Agronomic characteristics (see table 2). Flora is a winter-type homodiploid triticale. It tends to be shorter than or similar in height to Stephens and has excellent straw strength and lodging resistance. Flora tillers well and has the ability to produce exceptionally large heads. Thin stands can be compensated by increased tillering and head enlargement.

Flora is cold-tolerant and has an excellent winter survival record at Flora, Oregon. Winter survival ratings for Flora have been higher than those for all common grown wheat varieties in

Table 2—Agronomic data for Flora triticale and commonly grown soft white wheat

<table>
<thead>
<tr>
<th>Location</th>
<th>Variety</th>
<th>Heading date</th>
<th>Plant height (inches)</th>
<th>Lodging</th>
<th>Bushel weight (lb)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hermiston</td>
<td>Flora</td>
<td>May 23</td>
<td>37</td>
<td>14</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Stephens</td>
<td>May 22</td>
<td>39</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>Madras</td>
<td>Daws</td>
<td>June 23</td>
<td>36</td>
<td>54</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Stephens</td>
<td>June 23</td>
<td>30</td>
<td>55</td>
<td></td>
</tr>
<tr>
<td>Hill 81</td>
<td>Stephens</td>
<td>June 23</td>
<td>30</td>
<td>55</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Stephens</td>
<td>June 23</td>
<td>30</td>
<td>55</td>
<td></td>
</tr>
</tbody>
</table>

Disease resistance. One of the striking attributes of Flora is its resistance to, or tolerance of, diseases associated with early fall plantings. Flora appears to be tolerant of barley yellow dwarf virus (BYDV). In 6 years of testing at Hermiston, no BYDV symptoms were observed in Flora plots.

Flora also appears to resist stripe rust, leaf rust, stem rust, septoria, dwarf smut, and snow mold infestations. Flora is susceptible to ergot and stripe rust and to a crown rot (commonly called "banana leaf") believed to be of bacterial origin. This crown rot has been a very serious problem in wet years on poorly drained soils in western Oregon.

Because of its disease resistance, Flora has a decisive advantage in early planting over currently available wheat varieties. Early growth is prostrate and of moderate density. August-September-planted Flora should produce excellent fall soil cover and moderate grain yields for producers who want to protect soils susceptible to wind erosion.

Shattering and threshability. Flora is resistant to shattering under high rainfall and irrigated production conditions; however, its rachis is brittle at maturity, and spikes have a tendency to break into pieces rather than to thresh freely at harvest. In low-rainfall, summer-fallow areas, shattering may be a problem.

Table 2 shows yield results and location details for Flora triticale and Stephens wheat over several years and sites.
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