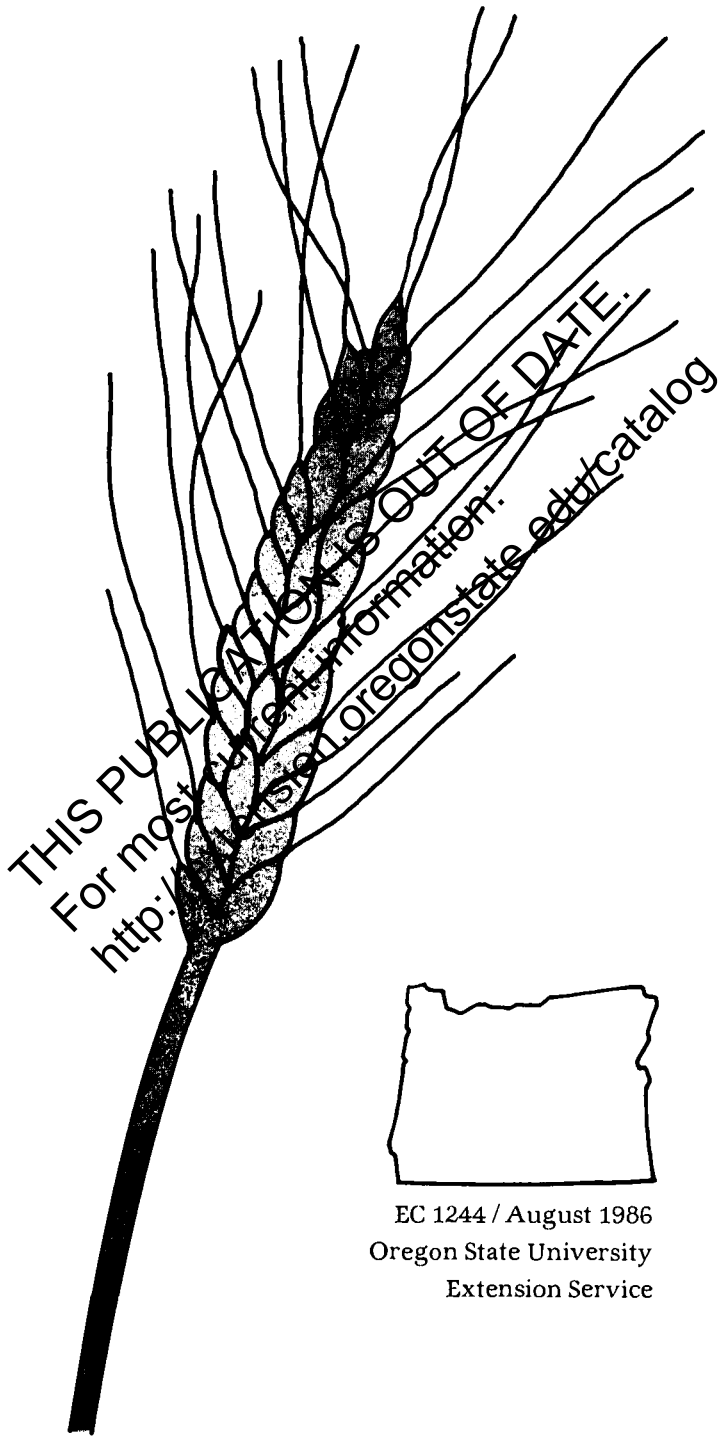
Oregon Cereal Variety Profile

Flora

A Winter Triticale



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Flora: A Winter Triticale

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Tritieale is a "new" erop to many growers. In this publieation, we will review some of the potentials and problems of triticales as a group and introduee Flora, a new triticale variety developed by Oregon State University.

A brief history of triticale

Tritieale is a product of modern crop breeding. It is the hybrid progeny of erosses made between wheat (genus *Triticum*) and rye (genus *Secale*). The goal in making wheat-rye hybrids is to eombine the high yield and high seed protein eontent of wheat with the broad adaptability and higher lysine eontent of rye.

Sueh erosses were first sueecssfully made in the 1870's, but the resulting offspring were sterile. Fertile progeny were produced in the late 1930's, and serious rcsearch efforts began in the 1950's. Today, tritieales are grown on about 2 million aeres around the world, offering new food and feed resourees.

Tritieales have a broad genetie base and vary dramatieally in plant eharacteristies. Some are very wheatlike, but others exhibit more of the rye parent features. Beeause of their unusual genetic baek-ground, triticale varieties will vary signifieantly in their adaptability and in grain quality.

In the past, tritieales have been frowned on in some parts of the Paeifie 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 shattering, and the resulting volunteer plants ean be quite obvious in the next barley and wheat erops beeause of their greater height and/or head eharaeteristies. Barleys and wheats also shatter, but their volunteer progeny are often hidden in subsequent crops.

Newer tritieales have a shatter rate similar to eurrently grown wheat and barley varieties, and similar eultural praetiees ean be used to control volunteers. In general, eultural praetiees for triticale are identieal to those for wheat and barley.

Older tritieale varieties are tall and are suseeptible to lodging. Extensive breeding efforts are produeing new semidwarf, lodging-resistant varieties.

Flora

One of the new generation of tritieale varieties, Flora is a rough-awned, semidwarf, winter feed tritieale released by Oregon State University. Like other tritiealcs, it is a hybrid eontaining both rye and wheat genetic material. Flora has had exeellent yield in high-produetion areas of Oregon and Idaho.

Areas of adaptation

Flora is adapted to the high-rainfall inter-mountain 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 (both yield and quality are poor under such eonditions).

Flora is not reeommended for use on the poorly drained soils of western Oregon and Washington because of its suseeptibility to a erown rot believed to be of baeterial origin.

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 mueh as 31 bushels per aere. In tests eondueted 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. Tritieales tend to produce lightweight, slightly wrinkled seed. Flora is no exeeption. Flora test weights have averaged around 42 lb/bushel, but they have been as high as 48 lb/bushel. The kernels are large and shriveled in appearance. Test weight data are provided in table 2.

Agronomie eharaeteristies (see table 2). Flora is a winter-type, semidwarf tritieale. It tends to be shorter than, or similar in height to, Stephens and has exeellent straw strength and lodging resistanee.

Flora tillers well and has the ability to produee exceptionally large heads. Thin stands can be compensated by increased tillering and head enlargement.

Flora is eold-tolerant and has an excellent winter survival record at Flora, Oregon. Winter survival ratings for Flora have been higher than those for all eommonly grown wheat varieties in tests eondueted near Hermiston, Oregon. In addition, frost heaving has been less of a problem in Flora stands than in those of other eommon wheat varieties.

Disease resistanee. One of the striking attributes of Flora is its resistance to, or or toleranee of, diseases assoeiated 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 eephalosporium stripe and to a erown rot (commonly called "banana leaf") believed to be of baeterial origin. This erown rot has been a very serious problem in wet years on poorly drained soils in western Oregon.

Because of its disease resistanee, Flora has a deeisive advantage in early plantings over eurrently available wheat varieties. Early growth is prostrate and of moderate density. August-September-planted Flora should produee exeellent fall soil eover and moderate grain yields for produeers who want to proteet soils suseeptible to wind erosion.

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

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

Variety	Loeation	1979	1980	1981	1982	1983	Average
Flora	Hermiston	64	109	136	108	110	105
	Madras	—	—	—	105	—	105
	Ontario	69	126	124	87	126	106
	Pendleton	28	92	80	—	111	78
	Union	—	—	94	—	—	94
	Average	54	109	109	100	116	98
Stephens	Hermiston	33	86	142	114	114	98
	Madras	—	—	—	78	—	78
	Ontario	100	147	152	132	172	141
	Pendleton	39	66	64	—	121	73
	Union	—	—	59	—	—	59
	Average	57	99	104	108	135	101

Table 2—Agronomie data for Flora tritieale and eommonly grown soft white winter wheats

Loeation	Variety	Heading date	Plant height (inches)	Lodging %	Bushel weight (lb)
Hermiston (1982)	Flora	May 23	37	—	44
	Stephens	May 22	39	—	60
Madras (1982)	Daws	June 23	36	0	54
	Flora	June 21	33	0	41
	Hill 81	June 22	38	0	54
	Stephens	June 21	31	0	55

Special characteristics. Flora, like other triticales, has generally shown a tolerance of mildly acidic soil conditions. In addition, Flora is very tolerant of high sodium soils. Acceptable yields have been obtained on soils having a pH up to 8.0. Producers had not been able to grow cereal crops on these soils in the past.

Use

Kernel quality in Flora is not as good as that of wheat or experimental triticale lines now being tested. Test weights are similar to that of barley. Harvested grain has generally been sold as feed at feed barley or mixed grain prices.

Tom Savage, OSU associate professor of poultry science, has used Flora triticale as a protein source in feed rations for medium white breeder tom turkeys. Studies to date show that Flora triticale can be used as the sole source of dietary protein for maintaining toms in semen production.

The triticale diet has also had a significant influence on meat quality. Laboratory and taste test panels have revealed that meat from triticale-fed turkeys is more tender and moist than that from birds fed traditional diets. Further work is underway to verify these findings.

Development

Flora was derived from a cross made by Frank Zillinsky in 1972 at the Center for Maize and Wheat Improvement (CIMMYT) in Ciudad Obregon, Sonora, Mexico.

Robert J. Metzger, professor of cytogenetics, USDA-ARS, Corvallis, Oregon, obtained F_2 seed in 1973. In 1976, after two cycles of selection at Corvallis, he sent seed of several advanced lines to Mathias Kolding, senior instructor (cereals), Columbia Basin Agricultural Research and Extension Center, Hermiston, for testing and selection in eastern Oregon.

The experimental lines were grown and selected at both the Hermiston Experiment Station and on the Wulff Ranch near Flora, Oregon. Breeder seed was produced in 1982.

Foundation seed stocks will be maintained by and will be available through the Foundation Seed Project, Oregon State University, Corvallis, Oregon.

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