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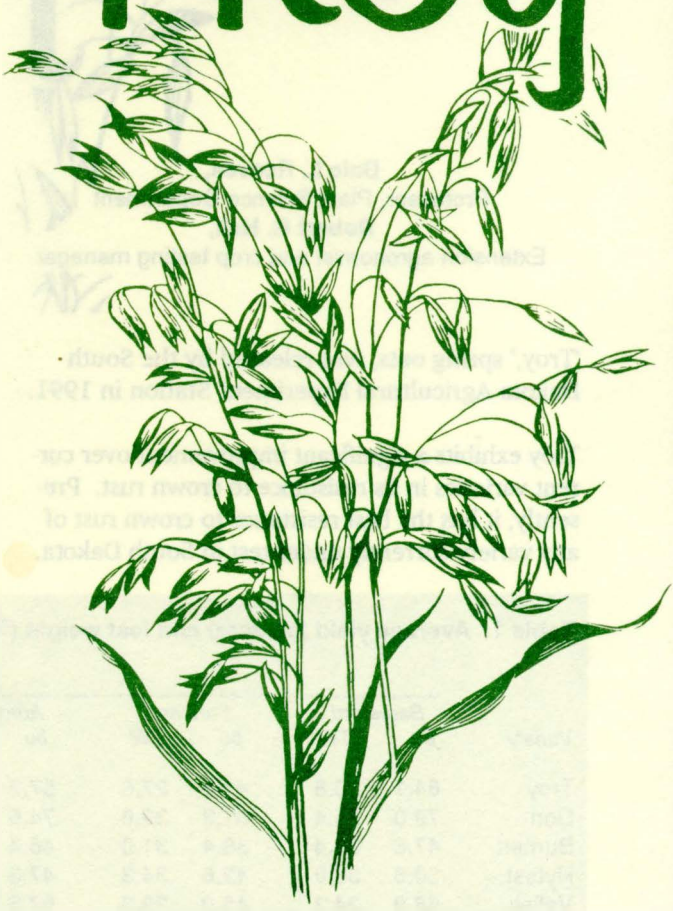

Agricultural Experiment Station
South Dakota State University
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A CROWN RUST RESISTANT OAT:

TROY

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'Troy,' spring oats, was released by the South Dakota Agricultural Experiment Station in 1991.

Troy exhibits a significant improvement over current varieties in its resistance to crown rust. Presently, it has the best resistance to crown rust of any variety currently under test in South Dakota.

Origin. Troy, tested as SD84104, was developed from the cross WI2221-2//Noble/Nodaway 70/3/MN78142. Troy has been in the South Dakota Crop Performance Testing Program since 1988.

Agronomic characteristics. Troy has white kernels with high groat protein content and medium test weight. It is medium-late in maturity, being about 5 days later than 'Don,' one day later than 'Settler,' and equal to 'Valley' (Table 3).

Troy is medium-tall, averaging 3 to 4 inches taller than Don and an inch taller than Settler (Table 3). Straw strength is rated as fair.

Crown rust resistance is the major advantage of this variety. Troy is the only variety currently tested in South Dakota that is 90% resistant to the newer strains of crown rust. Troy also has some tolerance to barley yellow dwarf (BYD) virus, commonly called "red leaf." As indicated in Table 3, its red-leaf rating of 2.3 is not as low as the 1.3 of Don but is an improvement over other popular varieties.

Troy has a medium-high to high groat protein content, higher than other varieties listed in Table 3.

Although Troy has not yet undergone milling tests, its kernel size and thin hull suggests that it should yield a high percentage of meal. Kernels are medium sized with a white hull. In 1989 it had a groat percentage of 70.2 compared to 69.7, 69.1, 71.6, and 69.5 for Burnett, Don, Kelly, and Settler, respectively.

Performance data. Troy has performed well in both the eastern and western areas of South Dakota. Although not shown in Tables 1 or 2, Troy was in the top yielding group at 9 of 13 (69%) locations tested. The only varieties listed that appeared in the top yielding group more often were Don and Valley at 85%. In eastern South Dakota, Troy was in the top yielding group at Brookings, Watertown, Beresford, Selby, and Groton (Table 1). In western areas of the state it was in the top yielding group at Wall, Bison, Martin, and Bear Butte (Table 2).

Tables 1 and 2 suggest that the range of adaptation of Troy for yield stability is fairly wide (in the top yield group at 69% of locations tested), while its range of adaptation for test weight is fairly narrow. Troy exhibits a high test weight at Brookings, Watertown, and Groton, an intermediate test weight at Aurora Co., and a low test

Table 1. Average yield (bu/acre) and test weight (TW, lbs/bu) comparison for eight eastern South Dakota locations, 1989-91.

	Location																	
	Beresford		Freeman		Aurora Co		Brookings		Highmore		Watertown		Groton		Selby		Average	
Variety	bu	TW	bu	TW	bu	TW	bu	TW	bu	TW	bu	TW	bu	TW	bu	TW	bu	TW
Troy	64.1	30.8	41.2	27.6	57.2	32.8	94.3	33.2	71.5	34.6	97.4	35.1	125.6	35.2	88.5	36.0	80.1	33.2
Don	79.0	35.4	61.3	32.6	74.6	33.3	103.1	32.1	80.9	36.5	104.5	35.3	125.8	35.7	94.8	36.0	90.6	34.6
Burnett	47.8	33.4	38.4	31.0	46.4	31.6	62.6	30.8	70.7	36.2	87.6	33.4	104.0	35.5	79.1	35.8	67.2	33.5
Hytest	50.6	36.9	42.6	34.3	47.3	32.9	67.7	34.6	66.5	39.0	84.2	36.7	103.1	37.5	77.4	39.2	67.6	36.4
Valley	68.9	34.3	48.0	29.3	67.5	33.5	99.8	30.9	73.6	35.1	105.3	33.6	137.3	35.1	96.6	36.5	87.2	33.5
Settler	74.2	33.3	57.4	31.7	62.8	32.7	102.4	32.7	75.5	35.0	103.6	34.8	122.5	36.2	89.5	37.8	86.3	34.3

Table 2. Average yield (bu/acre) and test weight (TW, lbs/bu) comparison for eight western South Dakota locations, 1989-91.

	Location											
	Martin		Wall		Bear Butte		Bison		Ralph		Average	
Variety	bu	TW	bu	TW	bu	TW	bu	TW	bu	TW	bu	TW
Troy	53.8	29.4	45.6	28.3	44.0	25.4	78.8	28.1	63.9	35.0	57.2	29.2
Don	55.9	32.4	54.2	32.3	43.8	31.5	65.5	34.7	59.8	35.6	55.8	33.3
Burnett	44.6	32.1	46.7	31.8	39.1	28.4	61.6	33.4	59.4	36.7	50.3	32.5
Hytest	43.4	33.5	48.5	34.3	55.2	31.0	63.9	36.2	57.7	38.6	53.7	34.7
Valley	50.9	31.4	50.9	32.4	38.2	27.4	76.2	31.3	69.0	36.0	57.0	31.7
Settler	51.3	31.8	51.7	31.9	42.8	29.4	73.3	31.2	63.0	36.3	56.4	32.1

Table 3. Agronomic characteristics of 'Troy' compared to other varieties.

	1991, days planting to	1989-91	Straw	1989 groat	Disease resistance			
Variety	heading	height	strength	protein	Red leaf	Smut	Stem rust	Crown rust
Troy	67	34	Fair	19.2	2.3*	MR#	S#	MR#
Don	62	30	Good	17.1	1.3	R	MS	S
Burnett	64	34	Poor	17.8	6.0	MR	S	S
Hytest	65	35	Good	18.5	6.1	MR	MS	MS
Valley	67	30	Good	18.1	2.9	MS	R	MS
Settler	66	33	Good	18.3	1.7	MR	S	MS

* 1990 Rating, 1 = most resistant to 9 = most susceptible
# S = susceptible, MS = moderately susceptible, MR = moderately resistant, R = resistant

weight at Beresford and Freeman when compared to other varieties. In western South Dakota, Troy exhibits a low test weight across all test locations when compared to other varieties (Tables 1 and 2). Regional tests indicate Troy has a very good test weight when conditions are favorable. However, under hot or dry conditions its test weight drops faster than average.

Summary. Present yield and test weight data suggests Troy is widely adapted for yield but best adapted to the northeast section of the state when test weight is a major variety selection factor. Its yield and test weight data along with its crown rust and red leaf resistance should make this a **desirable variety for oat growers in northeastern South Dakota and adjacent areas of other states.**

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