Hard Red Spring Wheat and Durum Wheat Production Guide (continued)

A-1050, May 1998

Weed Control (continued)

1997 North Dakota herbicide price list.

The listings are **approximate retail prices** for small quantities. Herbicide prices do not include cost of such additives as surfactants, oils, fertilizer or application costs. Prices may vary depending on area of the state, wholesaler, bulk discounts, seasonal changes, quantities purchased and particular programs the manufacturing company offers. Prices are averages based on statewide dealer survey for small quantities. Producers should consult local agricultural product suppliers for exact price of each product in their area.

Product	Formulation	Active Ingredients	Cost/Unit
Achieve	40DG	tralkoxydim	20.00 oz
Ally	60DF	metsulfuron	
Amber	75DF	triasulfuron	8.50 oz
Assert	2.5S	imazamethabenz	118.00 gal
	67SG		2.00 oz
Avenge	2S	difenzoquat	44.50 gal
B-4	2+2E	Bronate + AGSCO 400	32.00 gal
Banvel	4S	dicamba	80.00 gal
Banvel SGF	2S	bromoxynil + MCPAe	40.50 gal
Bison	2 + 2E	bromoxynil	46.00 gal
Broclean	2E	bromoxynil + MCPAe	49.00 gal
Bromac	2 + 2E		45.00 gal

Bronate	2 + 2E	bromoxynil + MCPAe	48.00 gal
Buckle	10 + 3G	triallate + trifluralin	1.13 lb
Buctril	2E	bromoxynil	50.00 gal
	4GEL		100.00 gal
Canvas	71.25DF	thifensulfuron + tribenuron + metsulfurn	13.50 oz
Cheyenne	fenoxaprop-P + MCPA + thifensulfuron + tribenuron 0.467 + 2.16e + 50DF + 25DF		750.00 case
Clarity	4S	dicamba	82.50 gal
Curtail	0.38 + 2S	clopyralid + 2,4-D	36.00 gal
Curtail M	0.42 + 2.35S	clopyralid + MCPAe	40.50 gal
Dakota	0.234 + 2.84E	fenoxaprop + MCPAe	52.50 gal
Express	75DF	tribenuron	15.50 oz
Fallow Master	1.1 + 0.5S	glyphosate + dicamba	17.00 gal
Far-Go	4E	triallate	40.00 gal
	10G		0.90 lb
Finesse	62.5 + 12.5DF	metsulfuron + chlorsulfuron	12.00 oz
Glyphos	3S	glyphosate	45.00 gal
Gramoxone Extra	2.5S	paraquat	34.50 gal
Harmony Extra	50 + 25DF	thifensulfuron + tribenuron	11.00 oz
Hoelon	3E	diclofop	58.50 gal
Landmaster BW	0.9 + 1.5S	glyphosate + 2,4-D	21.00 gal
Liberty	1.67S	glufosinate	0.75 oz
MCPA amine	4S	MCPA	17.00 gal
MCPA ester	4E		15.00 gal
Moxy	2E	bromoxynil	53.00 gal
Peak	57DF	prosulfuron	10.00 oz
Puma	1EC	fenoxaprop-P	200 gal
Roundup Ultra	3S		50.00 gal
Roundup Ultra	3S		40.00 gal
RT			30.00 gal
Stampede	80EDF	propanil	4.50 lb
Stinger	3S	clopyralid	455.00 gal
Sword	5.2EC	MCPA	27.00 gal
Tiller	0.37+0.58+1.75E	fenoxaprop-P +	81.00 gal

		MCPA+2,4-D	
Tordon 22K	2S	picloram	80.00 gal
Touchdown	5E	glyphosate - tms salt	62.00 gal
Treflan MTF	4EC	trifluralin	32.00 gal
Treflan Pro-5	5EC		40.50 gal
Treflan	5G		0.92 lb
Treflan	TR10		0.98 lb
Trific	60DF	trifluralin	4.25 lb
Trilin	10G		0.90 lb
Tri-4	4EC		34.00 gal
Trifluralin/Trust	4EC		28.00 gal
2,4-D amine	3.8S	2,4-D	12.00 gal
2,4-D ester	3.8E		14.00 gal
LV ester	5.7E		19.00 gal
AGSCO 400	4E		17.90 gal
Formula 40	4S		14.25 gal
Hi-Dep	4S		18.00 gal
Class 80A	80WSP		3.20 lb
WSP	4EC		
Saber	5EC		27.00 gal
Salvo	79DS		3.45 lb
Savage			

1997 North Dakota herbicide price list. (continued)

	Product/A			**Cost/A** ($)		
Product	**Low**	**Med**	**High**	**Low**	**Med**	**High**
Achieve	7.5 oz	0.1 oz	7.5 oz	1.00	2.00	6.00
Ally	0.05 oz		0.3 oz			
Amber	0.14 oz	0.28 oz	0.56 oz	1.19	2.38	4.76
Assert	0.6 pt	1 pt	1.2 pt	8.85	14.75	17.70

	4.5 oz	7.5 oz	9 oz	9.00	15.00	18.00
Avenge	2.5 pt	3 pt	4 pt	13.90	16.70	22.25
B-4	1.5 pt	1.75 pt	2 pt	6.00	7.00	8.00
Banvel	2 fl oz	1 pt	4 pt	1.25	10.00	40.00
Banvel SGF	4 fl oz	2 pt	8 pt	1.25	10.00	40.00
Bison	0.75 pt	1 pt	1.5 pt	4.30	5.75	8.63
Broclean	1 pt	1.5 pt	2 pt	6.13	9.40	12.50
Bromac	0.75 pt	1 pt	1.5 pt	4.20	5.60	8.45
Bronate	0.75 pt	1 pt	1.5 pt	4.50	6.00	9.00
Buckle	10 lb	11 lb	12.7 lb	11.30	12.45	14.35
Buctril	1 pt	1.5 pt	2 pt	6.25	9.40	12.50
	0.5 pt	0.75 pt	1 pt	6.25	9.40	12.50
Canvas	10 A/pk	—	5 A/pk	2.70	—	5.40
Cheyenne	Each case treats 40 acres			18.75	—	18.75
Clarity	0.5 pt	0.75 pt	1 pt	5.15	7.75	10.30
Curtail	2 pt	4 pt	8 pt	9.00	18.00	36.00
Curtail M	1.75 pt	2 pt	2.33 pt	8.85	10.15	11.80
Dakota	16 fl oz	—	21.3 fl oz	6.55	—	8.75
Express	0.08 oz	0.25 oz	0.33 oz	1.24	3.90	5.10
Fallow Master	22 fl oz	33 fl oz	44 fl oz	2.90	4.40	5.85
Far-Go	1 qt	1.25 qt	1.5 qt	10.00	12.50	15.00
	10 lb	12.5 lb	15 lb	9.00	11.25	13.50
Finesse	0.2 oz	0.25 oz	0.3 oz	2.40	3.00	3.60
Glyphos	0.5 pt	2 pt	4 pt	2.80	11.25	22.50
Gramoxone Extra	0.8 pt	2 pt	3 pt	3.45	8.65	13.00
Harmony Extra	0.15 oz	0.3 oz	0.6 oz	1.65	3.30	6.60
Hoelon	2 pt	2.5 pt	2.7 pt	14.65	18.30	19.75
Landmaster BW	27 fl oz	40 fl oz	54 fl oz	4.45	6.55	8.85
Liberty	16 fl oz	20 fl oz	28 fl oz	12.00	15.00	21.00
MCPA amine	0.4 pt	1 pt	2 pt	0.85	2.15	4.25
MCPA ester	0.5 pt	1 pt	2 pt	0.94	1.90	3.75
Moxy	1 pt	1.5 pt	2 pt	6.65	9.95	13.25
Peak	0.25 oz	0.38 oz	0.5 oz	2.50	3.80	5.00
Puma	0.33 pt	0.4 pt	0.67 pt	8.25	10.00	16.75
Roundup Ultra	0.5 pt	2 pt	4 pt	3.15	12.50	25.00
Roundup Ultra	0.5 pt	2 pt	4 pt	2.50	10.00	20.00
RT	0.5 pt	2 pt	4 pt	1.88	7.50	15.00

Stampede	1.25 lb	1.3 lb	1.4 lb	5.65	5.85	6.30
Stinger	0.25 pt	0.5 pt	0.67 pt	14.20	28.40	38.10
Sword	3 fl oz	1 pt	2 pt	0.63	3.40	6.75
Tiller	1 pt	1.2 pt	1.7 pt	10.10	12.15	17.20
Tordon 22K	1 oz	—	1.5 oz	0.63	—	0.94
	1 pt	2 pt	8 pt	10.00	20.00	80.00
Touchdown	1 pt	2 pt	3 pt	7.60	15.50	23.25
Treflan MTF	1 pt	2 pt	4 pt	4.00	8.00	16.00
Treflan Pro-5	0.8 pt	2 pt	3.2 pt	4.10	10.15	20.25
Treflan	10 lb	25 lb	40 lb	9.20	23.00	36.80
Treflan	5 lb	10 lb	20 lb	4.90	9.80	19.60
Trific	.80 lb	2 lb	3.33 lb	3.55	3.80	14.15
Trilin	10 lb	25 lb	40 lb	9.00	22.50	36.00
Tri-4	1 pt	2 pt	4 pt	4.25	8.50	17.00
Trifluralin/Trust	1 pt	2 pt	4 pt	3.50	7.00	14.00
2,4-D amine	0.5 pt	2 pt	4 pt	0.75	3.00	6.00
2,4-D ester	0.4 pt	2 pt	4 pt	0.70	3.50	7.00
LV ester	0.33 pt	2 pt	4 pt	0.78	4.75	9.50
AGSCO 400	0.125 pt	2 pt	4 pt	0.30	1.10	2.25
Formula 40	0.5 pt	2 pt	4 pt	0.89	3.55	7.15
Hi-Dep	0.25 pt	2 pt	4 pt	0.56	4.50	9.00
Class 80A	4.5 oz	1 lb	2 lb	0.90	3.20	6.40
WSP	0.2 pt	1 pt	2.25 pt	0.68	3.90	7.60
Saber	0.5 pt	2 pt	4 pt			
Salvo	0.5 lb	0.75 lb	1.5 lb	1.75	2.60	5.20
Savage						

Disease Management in HRS and Durum Wheat

Seedling diseases, seed treatment – Shriveled, low test weight, diseased, or weathered seed benefits from seed treatment that provides protection from soil-borne fungi or seed-borne fungi. Cold, moist soils slow the growth of seedlings and favor growth of certain disease organisms. Prolonged exposure to dry soils which hinder germination also may result in fungal decay. Seed

treatment stops these organisms from causing decay, rot, and blight. Different fungicides may be used for different purposes. Select the fungicide correctly for the job to be done (see Fungicide Tables). Some products are a combination of fungicide and insecticide. Always avoid over-application with seed treatment products.

Loose smut – Loose smut of wheat can be controlled with seed treatment fungicides containing carboxin, difenoconazole, or triadimenol (see Fungicide Tables). All currently grown wheat varieties are susceptible to loose smut, but the disease generally is not a severe problem in most wheat or durum cultivars. The embryo test to detect loose smut in barley seed can't be used to accurately determine loose smut in wheat seed. Suspected seed lots should be treated.

Root rots – **Common root rot** is a potential problem on wheat every year in North Dakota. Damage often is more severe under heat and moisture stress. Root rot shows as a seedling blight or as mature plant root and crown rot, with brown discoloration of the roots and crown. Heads on diseased plants have fewer seeds and shriveled seeds. Some plants turn white and die prematurely. The fungus that causes common root rot of wheat (and barley) survives in the soil and crop debris. Crop rotation away from wheat and barley, to crops such as flax, sugarbeets, corn, or beans, as well as fallow, helps reduce the disease. Difenoconazole, imazalil and triadimenol fungicides are registered for use as seed treatments to suppress common root rot.

Take-all is another serious root rot that can completely destroy a crop. It is recognized by a black shiny discoloration of the base of the plant. Take-all is found primarily in fields of continuous wheat cropping and very high soil moisture. When take-all occurs in a field, no wheat or barley should be grown in that field for at least three seasons. Oats is a good rotation crop, being much less susceptible to take-all. Difenoconazole and triadimenol seed treatments are registered for suppression of take-all of wheat.

Rusts – Stem and leaf rust fungi attack hard red spring and durum wheat. However, many varieties are resistant to both stem and leaf rust (See variety lists). Spores of the rust fungi overwinter in southern states and then are carried to North Dakota by winds. New races of rust appear periodically, making rust research and the release of new varieties necessary. Leaf rust can be controlled with fungicide sprays (See Fungicide Tables) when susceptible varieties are grown. Use of fungicides may be economic if yield potentials are 45-50 bu/A or more, and the price received for the wheat is $3.00 or greater.

Leaf diseases – Fungi such as the tan spot organism and several Septoria species may cause leaf diseases. If enough leaf area is killed, especially the flag leaf, grain fill and seed set are reduced. The results are lower test weights and poorer yields (yield losses from 10%-40% possible). Leaf disease-causing fungi and bacteria survive in infected cereal debris and trash, in grassy weeds, and sometimes in seed. Most of these disease organisms require long periods of dew or high humidities for infection to occur. The tan spot fungus and the Septoria fungi produce tiny, black fruiting bodies on wheat residue from which spores are wind blown to leaves, from early May to September. Varieties differ in susceptibility to fungal leaf spots (see table). Other leaf diseases that may occur include spot blotch and powdery mildew.

Chemical control (see Fungicide Tables) of fungal leaf spots is possible and practical under certain conditions — high yield potential, disease organisms present, and persistent humid weather. Crop rotation with a non-cereal crop reduces the risk of leaf spot diseases. Burying crop residue and fallow also help reduce disease; this can be done in the spring before planting so stubble and straw can catch winter snow.

Wheat streak mosaic causes severe yield losses to occur on spring wheat and durum some years. The wheat streak virus is carried

by the tiny, wind-blown, wheat curl mite. The mite lives and reproduces on wheat and many other grass hosts. It survives the winter on seeded and volunteer winter wheat and on some perennial grasses.

Control wheat streak in spring wheat and durum by preventing its development in nearby winter wheat — destroy all volunteer wheat in the winter wheat field to be planted and in all nearby fields at least two weeks before planting. Control these volunteers plus grassy weeds with cultivation or knock-down herbicides. Avoid planting winter wheat near green corn fields, which also are reservoirs of the mite and the virus. Winter wheat should not be planted too early, preferably not before September 15. Planting earlier dramatically increases the danger of wheat streak infection and also root rot, which decreases winter survival. In the spring, destroy any volunteer winter wheat still standing or any obviously infected winter wheat crop, or they will be sources of infection for nearby spring wheats. Spring wheat and durum should be planted early to avoid severe infection.

Scab – A *Fusarium* fungus causes **Fusarium head blight** (scab) when extended periods of humid, rainy weather occurs at flowering and during grain-fill. Parts or all of the heads become infected and infected areas have a bleached or white appearance. Scabby kernels or glumes often show a salmon-pink color at their base. Scab severely reduces yields and test weight. Scabby seed may contain fungal toxins. Among livestock, swine are the most susceptible to the scab toxins. The NDSU Veterinary Diagnostic Laboratory can test scabby grain for toxins (a fee is charged).

Reduce scab with crop rotation, allowing at least a one year break in small grains, corn, or grass. The severest scab often occurs in wheat that has been planted on last year's corn ground. Spring tillage to bury crop residues also helps reduce scab potential. Varieties vary in susceptibility to scab (see Fungicide Table). If favorable weather occurs near flowering, some foliar fungicide may reduce scab severity. Scabby grain should not be used for seed. If seeding scabby grain is unavoidable, treat with a seed treatment fungicide such as carboxin plus thiram, maneb plus imazalil, or difenconazole, to minimize seedling blight due to the scab fungus.

Glume blotch – The glume blotch fungus, Stagonospora (*Septoria) nodorum*, has been endemic in wheat leaves in North Dakota, causing slight to moderate damage. In 1986 glume blotch was confirmed for the first time in North Dakota on wheat glumes, primarily in the northeast, and primarily on durum. This fungus, and other species of Septoria, have contributed to low yields and low test weights in recent years throughout the state. The glume blotch fungus survives on wheat residue. Infection of glumes is favored by wet, warm weather following heading. The disease is managed by crop rotation and tillage practices. Foliar fungicides (see Fungicide Tables) help protect against leaf infection and have been shown to reduce glume infection in research done in southern states.

Note:

The fungicide tables for disease control of wheat are based on the latest information available from the North Dakota Agricultural Experiment Station, United States Department of Agriculture, Environmental Protection Agency (EPA) and the agricultural chemical industry.

The information conformed to federal and state regulations at the time of printing. Always follow label directions, making certain to check instructions on how to apply, when to apply, waiting periods prior to harvest, whether treated crops can be fed to livestock, and important safety precautions.

Check NDSU Extension Circular PP-622 "Field Crop Fungicide Guide" for further information.

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