

FERTILIZER GRADES and RATES FOR SMALL GRAINS

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FERTILIZER RECOMMENDATIONS in North Dakota are in pounds per acre to apply of nitrogen (N), phosphate (P_2O_5) and potash (K_2O).

For small grains, the pounds of phosphate per acre are to be applied by drill row attachment at seeding time. If phosphate is applied broadcast, separate from seeding, use 2 or 3 times the drill row rate. Potash is not recommended for small grains.

Small grains on fallow usually are fertilized by applying the phosphate, and sometimes a little nitrogen, by drill attachment. For small grains on nonfallow, where 10 to 30 pounds of nitrogen are recommended along with phosphate, the two often are applied together by drill attachment as a mixed or combination fertilizer. Another common method, especially at high rates of nitrogen, is to broadcast most of the nitrogen in fall or spring before seeding, and then apply the phosphate and starter nitrogen at seeding time with drill attachment.

Phosphate as well as nitrogen for small grains can be broadcast separate from seeding -- with phosphate at rates 2 or 3 times that for row placement.

Suitable fertilizer grades and rates per acre to fit soil test needs and methods of application for wheat, oats, barley and rye are listed in tables in this circular. Without soil tests, use rates of phosphate materials as suggested for low phosphorus test levels.

Fertilizer grades and materials listed are those now in major use in North Dakota. Bulk blended and liquid materials are being made in a wide variety of grades which may not be listed here. Use fertilizers not listed by fitting them in at rates where materials of similar ratio are indicated.

Solid, liquid or gas forms are of similar value when the fertilizer is placed properly.

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EXTENSION SERVICE

NORTH DAKOTA STATE UNIVERSITY
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FERTILIZERS FOR SMALL GRAINS SOWN ON SUMMERFALLOW

Suitable Grades and Rates for Drill Attachment and Broadcast Methods

Phosphorus test level	Recommended lbs. per acre N + P ₂ O ₅ + K ₂ O	Suitable ratios	Suitable grades	Lbs. per acre of fertilizer	
				Drill attachment	Broadcast
HIGH	(0-10) + 0 + 0 by Drill attachment	no fertilizer 1:0:0 or 2:1:0	33-0-0 20-0-0 27-14-0	30 or less 50 or less 35 or less	
MEDIUM	(0-10) + (15-20) + 0 by Drill attachment or	0:1:0	0-42-0 0-45-0 0-48-0 0-50-0	36-48 34-44 32-42 30-40	72-144 66-132 65-125 60-120
		1:8:0	5-40-0	38-50	75-110
		1:4:0	11-48-0 10-40-0 9-36-0	32-42 38-50 42-60	65-100 75-110 85-125
			16-48-0 13-39-0	32-42 38-52	60-70 75-85
	(0-10) + (30-60) + 0 Broadcast	1:3:0	16-48-0 13-39-0	32-42 38-52	60-70 75-85
		2:5:0	18-46-0	35-45	
		1:2:0	18-36-0	42-55	
LOW	(0-10) + 25 + 0 by Drill attachment or	0:1:0	0-42-0 0-45-0 0-48-0 0-50-0	60 56 52 50	120-180 110-170 100-160 100-150
		1:8:0	5-40-0	62	120-190
		1:4:0	11-48-0 10-40-0 9-36-0	52 62 70	100-110 120 140
			16-48-0 13-39-0	52 64	
	(0-10) + (50-75) + 0 Broadcast	1:3:0	16-48-0 13-39-0	52 64	
		2:5:0	18-46-0	55	
VERY LOW	(0-10) + 35 + 0 by Drill attachment or	0:1:0	0-42-0 0-45-0 0-48-0 0-50-0	84 78 72 70	170-250 160-240 150-220 140-210
		1:8:0	5-40-0	88	170-200
		1:4:0	11-48-0 10-40-0 9-36-0	72 88 98	
			16-48-0 13-39-0	72 90	
	(0-10) + (70-110) + 0 Broadcast	1:3:0	16-48-0 13-39-0	72 90	

FERTILIZERS FOR SMALL GRAIN SOWN ON NONFALLOW

Suitable Grades and Rates for Broadcast Nitrogen and Phosphate

Phosphorus test level	Recommended lbs. per acre $N + P_2O_5 + K_2O$	Suitable ratios	Suitable grades	Lbs. per acre of fertilizer
HIGH	(20-60) + 0 + 0	1:0:0	Straight nitrogen fertilizer materials and rates listed on next page for use in split application.	
MEDIUM	(20-60) + (30-60) + 0	1:3:0 2:5:0 1:2:0 4:5:0 1:1:0	16-48-0 13-39-0 18-46-0 18-36-0 16-20-0 25-25-0 23-23-0 20-20-0	125 150 110-130 110-170 150-300 120-140 130-260 150-300
LOW	(20-60) + (50-75) + 0	1:3:0 2:5:0 1:2:0 4:5:0 1:1:0	16-48-0 13-39-0 18-46-0 18-36-0 16-20-0 25-25-0 23-23-0 20-20-0	125-166 150-200 110-165 140-200 250-375 200-240 220-260 250-300
VERY LOW	(20-60) + (70-105) + 0	1:4:0 1:3:0 2:5:0 1:2:0 4:5:0	11-48-0 10-40-0 9-36-0 16-48-0 13-39-0 18-46-0 18-36-0 16-20-0	190-220 200-265 220-300 150-220 180-270 150-230 200-300 350-375

Broadcast rates of plant nutrients can be met also by making separate application of straight nitrogen fertilizer materials and straight phosphate materials.

FERTILIZERS FOR SMALL GRAIN SOWN ON NONFALLOW

Suitable Grades and Rates for Drill Attachment Application

Phosphorus test level	Recommended lbs./A $N + P_2O_5 + K_2O$	Suitable ratios	Suitable grades	Lbs. per acre of fertilizer
HIGH	(10-30) + 0 + 0	1:0:0	33-0-0 20-0-0	30-90 50-150
		2:1:0	27-14-0	40-110
MEDIUM	(10-30) + (15-20) + 0	2:1:0	27-14-0	100-110
		6:5:0	24-20-0	80-100
		1:1:0	25-25-0 23-23-0	60-80 65-90
			20-20-0	75-100
LOW	(10-30) + 25 + 0	4:5:0	16-20-0	125-150
		1:1:0	25-25-0 23-23-0 20-20-0	100-120 110-130 125-150
			24-20-0	120-125
			24-20-0	120-125
VERY LOW	(10-30) + 35 + 0	1:3:0	16-48-0 13-39-0	70-85 90-100
		1:2:0	18-36-0	100-110
		4:5:0	16-20-0	175-190
		1:1:0	25-25-0 23-23-0 20-20-0	130 140 160

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FERTILIZERS FOR SMALL GRAIN SOWN ON NONFALLOW

Broadcast Nitrogen Plus Drill Attachment Phosphate and Starter Nitrogen

Nitrogen fertilizers for broadcast			Phosphate & starter nitrogen by drill			
Material	Grade	Pounds per acre	Phosphorus test level	Suitable ratios	Suitable grades	Lbs. per acre of fertilizer
<u>Gas</u>			HIGH	None	None	None
Anhydrous ammonia	82-0-0	40-60	MEDIUM	1:4:0	9-36-0 10-40-0 11-48-0	42-60 38-50 32-42
<u>Liquids</u>						
Low pressure	16-0-0 to 40-0-0	125-300 50-125		1:3:0 2:5:0	16-48-0 13-39-0 18-46-0	30-42 38-52 35-45
Non pressure	20-0-0 to 32-0-0	100-250 65-150	LOW	1:4:0 1:3:0	9-36-0 10-40-0 11-48-0 16-48-0 13-39-0	70 62 52 52 64
<u>Solids</u>						
Urea	42-0-0 to 45-0-0	50-125		2:5:0	18-46-0	55
Ammonium nitrate	33-0-0	60-150	VERY LOW	1:4:0	9-36-0 10-40-0 11-48-0	98 88 72
Ammonium sulfate	20-0-0	100-250		1:3:0 2:5:0	16-48-0 13-39-0 18-46-0	72 90 75

Broadcast one of the straight nitrogen materials at rate suggested, in fall or spring before seeding. In addition, on medium, low, or very low testing soils apply one of the fertilizer grades suggested for drill attachment at a rate appropriate to the soil phosphate test level.