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Light Weight Durum for Seed

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EXTENSION SERVICE

NORTH DAKOTA AGRICULTURAL COLLEGE AND U.S. DEPARTMENT OF
AGRICULTURE COOPERATING

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Light Weight Durum for Seed

As a result of increased durum allotments for 1954 to provide needed supplies of semolina and macaroni production there will not be sufficient good heavy durum seed for planting. Widespread rust injury occurred on durum and wheat in North Dakota during 1953 resulting in much low test weight grain.

Because of this widespread rust injury to wheat and durum throughout North Dakota in 1953 it will be necessary to plant some seed in 1954 that is below normal in test weight. This will apply to durum in particular due to the shortage of heavy seed and the increased acreage that is being urged. Very little heavy durum seed is available from areas outside of North Dakota and quite a lot of light weight seed will have to be used.

If proper precautions are taken light weight seed should give satisfactory results. That light weight seed cannot withstand unfavorable conditions as well as plump heavy seed has been proved by past experience. However, light weight seed produced in the rust year of 1935 provided quite satisfactory stands. When plump seed is not available wheat or durum with a test weight of about 50 pounds or above should prove to be satisfactory, if the germination is good.

GERMINATION TEST IS IMPORTANT

It is important to get a germination test on light weight seed. If the germination is even as low as 75 percent, light weight seed can be used if an allowance is made to offset the lower germination. However, the number of kernels in a measured bushel increases rapidly as the test weight goes down and may more than offset the lower germination.

If lower test weight seed has high germination the rate of seeding can be reduced to allow for the greater number of kernels. Kernel counts of some of the common varieties of wheat and durum show the effect of test weight on the number of kernels in a measured bushel as shown in the following table.

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**APPROXIMATE NUMBER OF KERNELS PER BUSHEL
AT DIFFERENT TEST WEIGHTS**

DURUM					
Variety	Test Wt.	Approx. No. Kernels in measured bu.	Variety	Test Wt.	Approx. No. Kernels in measured bu.
Mindum	61.8	708,000	Lee	58.5	976,000
Mindum	58.0	963,000	Lee	54.0	1,473,000
Mindum	51.5	1,176,000	Lee	42.3	1,640,000
Stewart	61.3	770,000	Lee	40.0	1,522,000
Stewart	58.0	970,000	Mida	61.0	759,000
Stewart	49.0	1,336,000	Mida	57.8	1,039,000
Nugget	59.7	784,000	Mida	56.3	1,108,000
Nugget	57.5	864,000	Mida	52.2	1,275,000
Nugget	49.3	1,022,000	Mida	47.0	1,410,000
Vernum	62.2	707,000	Mida	35.0	1,830,000
Vernum	57.7	1,009,000	Thatcher	59.0	1,025,000
Ld 356	63.5	693,000	Thatcher	56.5	1,288,000
Ld 356	56.7	974,000	Thatcher	53.5	1,529,000
HARD WHEAT			Thatcher	49.5	1,748,000
Lee	61.0	847,000	Rushmore	58.3	1,028,000
Lee	60.2	1,000,000	Selkirk	58.3	912,000
Lee	58.7	1,125,000			

Durum varieties vary in size of kernels but appear to average around 750,000 kernels per bushel at 60-pound test weight. The kernels per bushel increase by about 1/3 to about 1 million per measured bushel at test weights of 56 to 57 pounds. When test weight is down to around 50 pounds per bushel the kernels per measured bushel may be nearly double that of durum which weighs 60 pounds or more.

Wheat varieties vary in size of kernel from about 800,000 to one million kernels per measured bushel at a 60-pound test weight. The number of kernels per bushel increase rapidly as the test weight decreases until the number is nearly double at the 50-pound test weight.

TEST WEIGHT AFFECTS RATE OF SEEDING

When 60-pound durum is seeded at the rate of 4 pecks per acre by measure in 6-inch rows it drops about 9 seeds per foot of drill row. Sixty-pound common wheat at 4 pecks per acre will seed about 10 to 12 kernels per foot of drill row. Many of the durum growers allow an extra peck in the seeding rate to equalize this difference. Fifty-pound test weight seed increases the
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number of seeds per foot of row to about 14 to 16 for durum and to 16 to 20 seeds per foot of drill row for wheat.

IT IS IMPORTANT TO TREAT LIGHT WEIGHT SEED

A study of light weight seed produced in 1935 as a result of rust injury was reported in a special Extension Service Circular "Shriveled Light Weight Wheat, Is It Suitable For Seed", by Stoa, Brentzel and Higgins. They found no significant correlation between plumpness of seed and germination but there was a decided positive correlation between plumpness of the seed and the size and vigor of the young plants produced.

Seed treatment improved the emergence of the plants and their early vigor. So it is even more important than usual to treat light weight seed to aid in carrying the small plants through a critical period when they are most likely to be attacked by rootrots and other seedling troubles.

1953 DURUM GERMINATES QUITE WELL

A check of germination tests of durum samples from the 1953 crop sent in to the State Seed Department indicates that much of the light weight durum will make satisfactory seed. Irvin Hagen, Deputy State Seed Commissioner, reports that the germination of 300 samples of durum from all parts of the durum area were as follows:

<u>Percent of 300 Samples Checked</u>	<u>Germination</u>
7%	90 to 100
43%	80 to 89
33%	70 to 79
14%	60 to 69
3%	below 60

As only normal sprouts are counted in determining germination in these tests this study indicates that a lot of the light weight durum should make satisfactory seed. Fifty percent of these samples tested 80 percent germination or above. Eighty three percent germinated 70 percent or above. However, 17 percent were below 70 percent which indicates the importance of securing germination tests of light weight seed.

WHAT IS THE BEST SEEDING RATE FOR WHEAT?

Is 3, 4, or 5 pecks of wheat per acre the best seeding rate? This is a question that is often argued by farmers. The
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difference of opinion is illustrated by a brief survey of office callers made in the winter of 1953-54 by County Extension Agents in Morton, McLean and Kidder counties. The first 97 office callers were asked what rate of seeding they used for wheat. A summary of the 97 answers is as follows:

<u>Pecks of Wheat Sown per Acre</u>	<u>Number Of Replies</u>
3	4
4	36
5	51
4 to 5	2
6	2
7	1
8	1

A frequent answer in the above survey as to why a farmer used a certain seeding rate was because it was the rate used by his father. What affect does seeding rate have on yield? It is not possible to select any one seeding rate as best. Many other factors beside the seeding rate usually determine the stand obtained.

HOW DOES RATE OF SEEDING AFFECT WHEAT YIELDS?

Relatively cool, moist conditions after emergence of the crop are favorable for stooling which results in a thicker stand even from lower rates of seeding. Even with higher rates of seeding thin stands may occur as a result of one or more of the following: Poor germination, insect damage, weediness, root-rot and seedling blights, drouth and high temperatures which before or right after emergence may thin out the stand or which may later destroy stools or tillers. However, nature quite often seems to balance the stand through heavier stooling of thin stands or in killing off plants or stools in a stand that is too heavy for the available moisture and fertility.

Yields obtained often will not be an accurate measurement of the proper rate of seeding. Aside from factors affecting the stand obtained, conditions during the growing season have an important effect on the yield. Moisture and temperatures, fertility available, weed competition, rust injury or injury from other diseases or insects will often be more important than the stand in determining the final yield.

Experiment Station trials in several states show that rate of seeding has much less effect on yields than is generally believed.

RATE OF SEEDING TRIALS, REPORTED IN "CROP PRODUCTION"

By Hughes and Henson

Station	No. of yrs.	Crop	Rate of Seeding in Pecks Per Acre and Yield Per Bu.							
			2	3	4	5	6	7	8	12
Williston	7a/	Wheat		26.7	31.5	31.0				
Edgeley	7a/	Wheat	8.4	9.5	11.3	11.6	11.6	11.7	11.8	10.7
S. Dakota	4a/	Wheat	11.5	11.6	14.5	12.2				
Oregon	7a/	Wheat	15.6	15.6	16.1	16.9	16.8	15.4	16.7	
Edgeley	7a/	Durum	8.2	9.7	9.9	10.3	10.2	10.5	9.7	9.6
S. Dakota	7	Durum			16.3	15.5	18.5	19.4	18.4	
S. Dakota	5a/	Durum		18.5	18.0	18.1	15.4	16.9		
Colorado	8a/	Durum	15.1	15.5	15.9	15.1	15.0			

a/- Net yields, amount of seed sown deducted from yield

So the best seeding rate will vary from year to year as affected by the conditions that occur. The size of seed varies in different varieties and this should be considered. The plumpness or test weight of the seed makes a great difference as to the number of seeds in a measured bushel which is the basis of the rate of seeding commonly used by farmers. The trials listed above indicate that a seeding rate of about 4 to 5 pecks per acre of wheat or durum has produced maximum yields.

SUGGESTIONS FOR LIGHT WEIGHT SEED

If light weight seed is to be planted the following suggestions can help reduce the hazards involved:

1. Use the plumpest and heaviest seed that can be obtained of the desired variety. Wheat or durum of about 50 pounds per bushel or above, which germinates well, is preferred.
2. Clean the seed severely to remove the lighter and smaller kernels.
3. Get a germination test.
4. Treat the seed.
5. Sow in good season at a moderate depth and adjust the seeding rate to the test weight and germination.
6. Provide a good seedbed to help the plants get off to a better start.

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