

TREATING SEED WHEAT INCREASES YIELDS

by
W. E. Brentzel, Plant Pathologist

A good disinfectant applied to seed wheat usually increases the germination and stand of plants, prevents covered or stinking smut in the subsequent crop, and reduces seedling blight due to fungus. In many cases the yield may be increased considerably by treating the seed.

Some varieties of wheat have resistance to covered or stinking smut, but most of the durumms and many varieties of hard wheat grown in this region are susceptible. Although the variety may be resistant the treatment still will be beneficial by preventing some of the seedling diseases and by increasing the germination of the seed. This Experiment Station has made extensive tests of many different kinds of seed treatments on wheat.

One test included samples from 102 farm bins in all counties of North Dakota. Included in the lot were 51 samples of amber durum and 51 of hard wheat. A portion of each sample was treated with New Improved Ceresan ($\frac{1}{2}$ oz. per bushel) and the remaining portion was planted without treating. Four hundred treated seeds and the same number of non-treated seeds from each sample were planted in the Pathology Greenhouse.

Counts of plants which were made 10 days later follow:

Class of wheat	Total Number of Plants Emerged	
	Treated seed	Non-treated seed
51 Hard Wheat Samples	18021 (88.3%)	16561 (81.1%)
51 Amber, Durum Samples	17040 (83.5%)	15736 (77.1%)

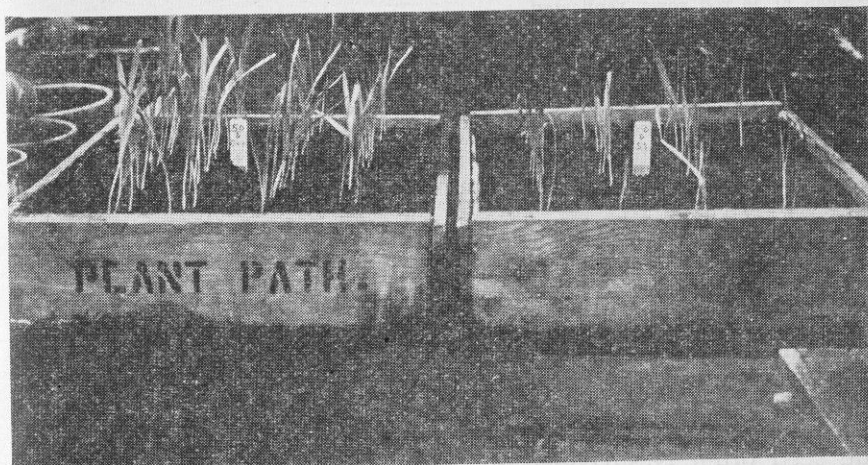


Figure 1.—Showing the effect of seed treatment on emergence and early vigor of plants. Left, plants from treated seed. Right, plants from non-treated seed.

The average increase in the number of hard wheat plants due to treating the seed was 7 per cent. The increase in amber durum plants was about the same. Some samples showed a much larger increase and some less than 7 per cent. A few had an increase of 20 per cent or more while some of the best lots, of course, showed little or no benefit.

Most of the treated samples emerged a day or two earlier than non-treated lots and the plants appeared to have more vigor and uniformity of size, due to treating. (Fig. 1).

Covered Smut Control

A good seed treatment is the best insurance against losses from covered smut.

A few new fungicides were tested in 1948 to compare with Ceresan (Table 1).

Table 1.—Showing the effects of seed treatments on emergence of wheat plants and on the subsequent development of covered smut at Fargo in 1948

Treatment	Per cent Emergence*	Per cent Covered Smut*	Yield** (grams)
New Improved Ceresan ½ ounce per bushel	86	1.15	2790
Ceresan M ½ ounce per bushel	85	0.78	2755
Panogen Slurry 1½ ounces per bushel	89	0.17	3055
Control non-treated	85	19.04	2470

*Mean of 10 rod rows, replicated.

**Total of 6 rod rows, replicated.

The seed used in this test was black with smut spores. Such seed requires a heavier dose of fungicide than generally used, and more than was used in this test. All the treatments listed in Table 1 appeared satisfactory, under the conditions of this test. This is the first year we have used Panogen in field tests.

Seedling Blight Control

Seedling blight, or early root rot, of plants often is caused by one or more kinds of fungi in the seed. Some kinds of fungus infections in the seed cannot be detected except by a careful laboratory examination, but one kind, which is common and destructive, may show as dark colored tips of the seeds (black point). When black points are caused by the root rotting fungus, *Helminthosporium*, the seed often is shriveled somewhat and the germination poor. Durum wheats are quite susceptible to this disease and it may also appear in some of the hard wheat varieties. Treating seed infected by the black point disease often gives considerable improvement

of the germination and subsequent yield of grain. In one series of tests at this Station treating infected red durum seed raised the germination from 58 per cent to 91 per cent. Also the yield of grain was increased about 20 per cent. These large increases from treating may not be obtained from every lot of seed but our experience with the seedling blight diseases has demonstrated that it pays to treat the seed.

Recommendations

Seed treatment often improves the stand and insures against losses from covered smut and other diseases.

Seed with black points or tips, if used at all, should be treated. Such seed sometimes is infected by the root rot fungus (*Helminthosporium*). Other types of fungi may cause black point, but if black point seed is shriveled and gives a low germination it may be infected with root rot and should not be used for seed. When the germination of black point seed shows a high germination, above 90 per cent, it probably would be safe to plant, if treated.

A new treatment may be good but it is wise to use one that has proved its value and one that is generally accepted as the best.

A safe practice is to treat all seed wheat every year.