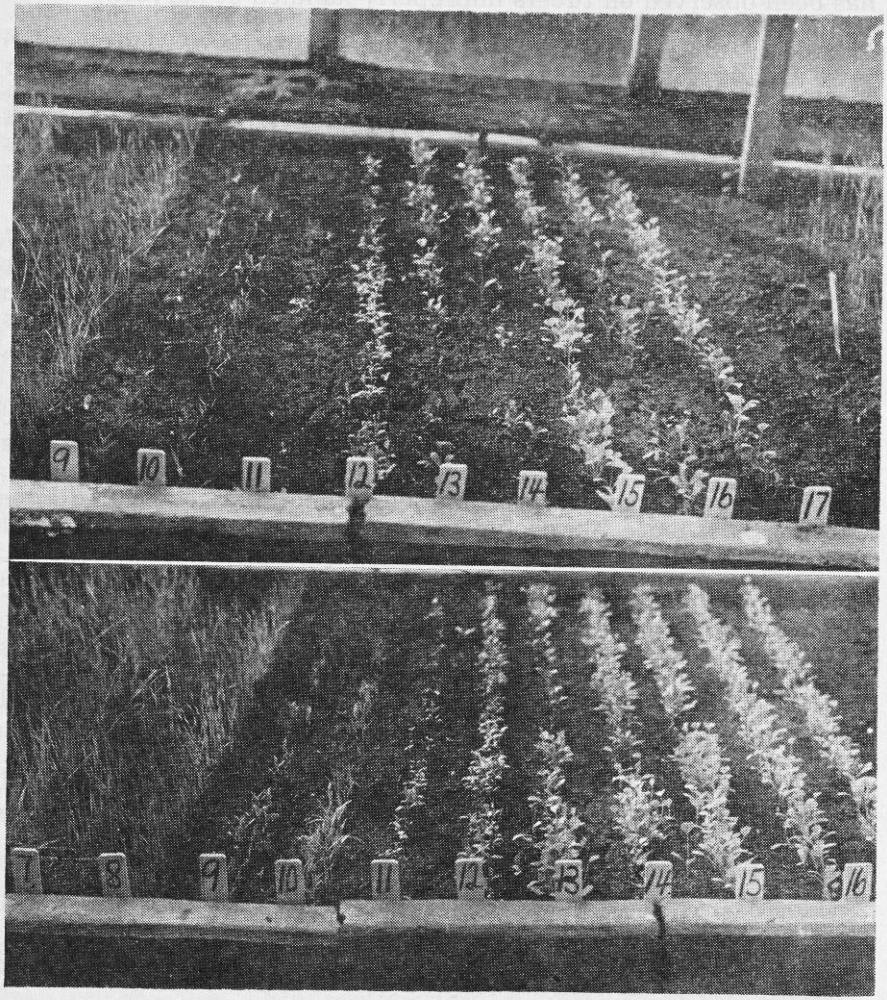

Showing the effects of seed treatment on emergence and early vigor of grass and legume seeds. Above, seed not treated. Below, seed treated.

9. Big bluestem
10. Switchgrass
11. Sweet clover, Madrid
12. Sweet clover, Evergreen
13. Alfalfa, Ranger
14. Alfalfa, Ladak
15. Alfalfa, Ranger
16. Alfalfa, 61% hard seeds
17. Alfalfa, 65% hard seeds

New Seed Treatments for Grass and Legume Seeds

By W. E. Brentzel[1]

Grass and legume seeds have not been treated very extensively with fungicides in this region. For some time after grass became one of the important crops in this region it was believed by many that treating the seed was of little value.

Perhaps this was because the matter was not given serious thought. Since the last world war a number of new seed disinfectants have come out and some of these have proved valuable as treatments for grass and legume seeds. Tests at the North Dakota Agricultural Experiment Station were begun last year. While the results are still in the preliminary stage, indications are that much benefit may be derived from treating these seeds. The value noticed was in the form of improved stands and vigor in the early stages of growth. The first tests were conducted in the greenhouse and marked improvements were observed in some cases as shown in the picture on opposite page.

The tests were subsequently carried to field plots. Small lots of treated seed were sowed in rows that could be carefully observed during germination and early growth. It is not easy to show, in figures, how much the early growth was improved but there was a marked difference in the stand determined by counting the plants that emerged (Table 1.)

Table 1. SHOWING EFFECTS OF SEED TREATMENTS ON THE EMERGENCE OF GRASS, SWEET CLOVER, AND ALFALFA PLANTS. (Field Sowing, 1950) Fargo, N. Dak.

Variety (one lot of each)	Emergence*		Treatment
	Treated	Non-Treated	
Green stipa	93	52	Arasan
Intermediate wheat grass	355	215	Phygon
Slender wheat grass	435	315	Phygon
Pubescent wheat grass	785	670	Phygon
Standard crested wheat grass	740	720	Phygon
Mandan wild rye	320	170	Panogen
Russian wild rye	575	530	Spergon
Big bluestem	130	73	Arasan
Switchgrass	310	77	Arasan
Sweet clover, Madrid	51	6	Spergon
Sweet clover, Evergreen	635	205	Arasan
Alfalfa, Ranger	380	68	Arasan
Alfalfa, Ranger	455	190	Phygon
Alfalfa, variety unknown	96	62	Spergon
Alfalfa, variety unknown	315	208	Phygon
Alfalfa, Ladak	480	136	Arasan

*Number of plants from equal weights of seed.

[1]Plant Pathologist.

The fungicides used in these tests included Arasan, Spergon, Phygon, and Panogen. With the exception of Panogen these fungicides contained no organic mercury. The mercury treatments such as Ceresan, Ceresan M, and Semesan have caused some injury of seed in certain cases and it is believed it would be risky to use them on many kinds of grasses.

The other fungicides are less active and a slight overdose will not as a rule cause damage. In these preliminary tests marked improvement in stands was obtained from one or more of the fungicides although no effort was made to determine which fungicide would be the best for any given kind of grass and legume. This will require considerable experimentation and time. It is probable that one kind of seed will respond better to a certain treatment than to another. These facts we hope to determine from future experiments. In Table I the fungicide which gave the best results in this one test on each particular kind of seed is shown in the right hand column.

In general, Arasan was very satisfactory, probably because it is not only a good fungicide but also is not critical to use. An overdose caused no apparent injury of the seed. Phygon in some cases gave good results but is somewhat more critical in respect to seed injury than Arasan. Spergon improved the stand from some lots of alfalfa and from Russian Wild Rye. One lot of sweet clover, too, seemed to be greatly improved from treating with Spergon. Panogen gave marked stimulation in germination in some tests but is more or less critical in respect to seed injury.

Naturally the best results were obtained from those lots of seed which were lacking in quality. In many cases seeds may be injured in threshing, when cracked seed coats or chipped seeds are a common occurrence. Such seeds are readily attacked by soil organisms. If the season is backward and germination has been delayed, many of these seeds fail to germinate, or if they do germinate, the seedlings may be destroyed by fungi before they can emerge from the soil. Treating the seeds seems to ward off fungus decays in the early stages.

Inoculating legume seeds, particularly alfalfa, with nitrogen-fixing nodule-forming bacteria, sometimes is desirable. It may be asked whether such inoculated seed may be treated for disease control. Experiments have shown that Arasan or Spergon may be applied even though the seed is to be inoculated. We have no information as to the effects of Phygon and Panogen on nitrogen-fixing bacteria. If inoculation is to be used it is recommended that the seed first be treated—anytime from 24 hours to 3 months before sowing— and then inoculated with the bacteria immediately before sowing. Inoculation should be applied not more than an hour before the seed is sown. In this way Arasan or Spergon will not interfere with the development of nitrogen-fixing bacteria.

Treating cereal crops is a general practice and there are many treating machines for this purpose. Some 500 or more are owned

by elevator and seed dealers in this state. In addition individual growers have many hundreds of small machines of different types. In some cases these machines may be used for treating grass and legumes but the job is somewhat more difficult and will require special attention. For the most part the treating of grass and legume seeds is done by the seed dealer.

Alfalfa often contains hard seeds which appear to be of good quality but because of the hardness will not germinate readily. Often these seeds germinate much better when treated. Some of the grass seeds have been scarce and all seeds of grass, alfalfa, and sweet clover have been high priced during the last several years. If treating the seed will improve the stand by 10 to 50 per cent it seems a good practice and one that will pay dividends on the cost. Treating is inexpensive in comparison with the high cost of seed, and is a practice which should be encouraged.

HYBRID CORN ACREAGE

A total of 702,000 acres, or 53.5 per cent of the entire corn acreage in North Dakota, was planted with hybrid seed in 1950. This compares with 650,000 acres or 52.5 per cent of the 1949 acreage planted with hybrids. The use of hybrid seed has increased each year since its introduction more than a decade ago, but the rate of increase the past five years was slower than from 1940 to 1945.

Hybrid seed corn in North Dakota is planted most extensively in the southeastern part of the state where most of the grain corn is grown, and where nearly 80 per cent of the 1950 acreage was planted with hybrids. Richland county is North Dakota's leading corn county and the only county where corn is as important as wheat. In 1949, most recent year for which county acreage is available, Richland county had 134,000 acres of corn, 129,000 acres of wheat.

For the United States as a whole, 65 million acres of corn, or 77.1 per cent of the 1950 acreage, was planted with hybrid seed in 1950—from report of the Office of Agricultural Statistician, USDA Bureau of Agricultural Economics, C. J. Heltemes, Agricultural Statistician in Charge, Fargo, N. D.

GRASS SEED PRODUCTION UP IN 1950

Production of range and pasture grass seeds in North Dakota in 1950 was considerably larger than in 1949, reports C. J. Heltemes, federal agricultural statistician at Fargo. Combined production of the six principal grass seeds grown in the state is estimated at 3,207,000 pounds (clean seed basis) compared with 1,228,000 pounds in 1949.

Most important is smooth bromegrass—2,500,000 pounds in 1950 compared with 990,000 pounds in 1949. Crested wheatgrass at 480,000 pounds in 1950 was more than three times the 140,000 pounds for the previous year. Slender wheatgrass seed yield was 120,000 pounds up from 32,000 in 1949; Canada wildrye—44,000, an increase over 36,000 in 1949; and Russian wildrye—30,000 pounds in 1950, the same amount as reported for the previous year. Western wheatgrass seed is estimated at 33,000 pounds with no reported production for the previous year.

Grass seed production for these six varieties utilized exactly 19,250,000 acres in 1950 compared to 11,600,000 acres in 1949.