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CHEMICAL SEED TREATMENT FOR FORAGE CROPS

Good seed germination is, and always will be, desirable; but, once the tiny grass and legume seeds are planted, they are on their own. Thousands of hostile organisms exist on the seed and in the soil, ready to attack the seedling plants as soon as they start to grow. These organisms cause seed rot, seedling blight, and damping off.

Chemical treatment of seed has become a recognized practice in the production of many major crops, such as corn, cotton, peanuts, and small grains. However, the treatment of seed of forage crops is relatively new.

For years, it has been known that grasses and small-seeded legumes are subject to seed rot and damping off the same as corn, cotton, and small grains. Most progress on the chemical treatment of forage crops seeds has been made since World War II. Perhaps the greatest reason for this is because of the great increase in grassland farming. Then too, there have been several new fungicides developed that are much safer to use than the old ones. Another reason for the hesitance in accepting legume seed treatment has been the fear that the chemicals would be harmful to nodule-forming bacteria. However, repeated tests by several state experiment stations have shown that some of the seed treatment materials are satisfactory when properly used as a seed disinfectant and the seed later inoculated according to directions just prior to planting.

In most cases, increased stand counts were used as the measure for evaluating the effectiveness of seed treatment. However, this is only a part of the story since stronger, more vigorous plants will make a more rapid recovery and regrowth after mowing. There is some indication that treated seed frequently produces more vigorous plants and more extensive root systems than untreated seed.

In using stand counts as a measure of evaluating the effectiveness of seed treatment, it must be borne in mind that many factors, other than soil organisms, may affect the stand of any particular seeding. Seed treatment offers protection only against seed-forne or soil-borne organisms. If these organisms are not present, or are not active, treated seed cannot be expected to behave any differently from untreated seed.

Laboratory tests under controlled conditions have demonstrated that proper seed treatment neither increases nor depresses the inherent germinability, viability, or natural vigor of common varieties of pasture and forage crop seeds. It merely protects the seed against certain organisms. Furthermore, stands from identical seed may differ in different parts of the same field whether the seed is treated or not. Good seed treatment substantially improves the chances of survival for each seedling. As a result, there should be fewer failures to get a good stand of grasses or legumes and fewer cases in which stands are irregular. On the other hand, seed treatment is not a fertilizer or nutrient. Seed-treating chemicals do not stimulate or speed up germination or growth.

Seed treatment improves germination by enabling seeds to make the best of their potentialities. It cannot restore life to dead seeds, but it does keep parasitic organisms from reducing germination. Furthermore, when seed germination is low, it is nearly always accompanied by a rather high percentage of weak seeds. Very often the protection given these weak seeds by chemical treatment will enable them to germinate and produce seedlings which they could not do without seed treatment.

Drs. Lefebvre and Hollowell of the United States Department of Agriculture have very aptly summed up the research work conducted by many state experiment stations and the United States Department of Agriculture. They state that field tests are not consistent, that the increase in stand amounted all the way from zero to several hundred per cent, that the greatest value occurred when damaged seed was treated and planted on infested soils, and where scarified seed was used. Adverse growing conditions, also, are a factor.

Certain of the earlier fungicides containing mercury were injurious when used at excessive rates. However, the newer chemical materials, such as Arasan and Spergon, are very effective and apparently cause no injury to the seeds. The Oklahoma Experiment Station reported good results in alfalfa seed treatment. They used Spergon, Arasan, Phygon, and Dow 9B. Nodulation was not retarted by the fungicides, and there was some evidence that these four actually improved nodule formations.

In Canada, experiments with alfalfa indicate that Semesan, Arasan, and Spergon were quite effective in checking the black stem fungus. Ceresan and Arasan were especially effective. Arasan used in excess is usually not injurious to seed even when stored, but Ceresan compounds frequently reduce seed germination, especially if used in amounts greater than those recommended by the manufacturer.

Although significant increases in stands are not always obtained from treated seed, it is apparent that, when a large number of tests are averaged, more plants are usually produced from treated seed. The benefit derived from seed treatment depends to a great extent on the thoroughness with which the fungicides are applied. Most farmers lack the equipment necessary for effectively treating seed. On the other hand, agencies that handle large quantities of seed, such as elevators and seed houses, are usually equipped with the necessary machinery for the thorough treatment of seed. Seed treatment costs very little, especially if it is done with the proper machinery on a large scale. The cost is usually around one cent per pound.

In general, where the seed is infected with seed-borne diseases, or damaged by mechanical injury and seeded under adverse growing conditions, seed treatment will prove beneficial.

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