

CHEMICALLY TREATED SEED SHOWS PROMISE IN FOREST NURSERY WORK

Joseph E. Ibberson

Chief, Division of Research, Pennsylvania Dept. of Forest & Waters
Harrisburg, Pennsylvania

Treatment of various seeds with commercial fungicides to prevent decay, damping-off, seedling blights and root rots is becoming standard practice in the growing of many agricultural products.

Each year new chemicals appear on the market, and the number of species which can be successfully treated is increased due to research efforts.

The science of treating seeds is at least three centuries old but seed treatment of grains, sugar beets and cotton has become standard procedure only since World War I. Peanuts, sorghum, rice and other vegetables are also commonly treated, and recent treatment of grass seeds and the seeds of small legumes have been successful.

Since small seeds carry very little food reserve they can be easily killed during the interval between germination and until seedling establishment.

Therefore, when the treated seed is planted a sterile area is developed in the soil surrounding it. This makes attacks by destructive soil organisms highly unlikely. Many seeds carry fungus spores that later develop and attack the plants after they become established. These diseases such as smut on grains can be controlled to some extent by treating the seed with a fungicide before planting.

Treatment of cottonseed, for example, is known to reduce seedling blight. Treated Dutch clover seed gave a 50% better stand than untreated seed. Improved stands of lima beans and peas are commonly obtained by coating the seeds with a fungicide.

These and many other similarly marked successes indicate that desirable results perhaps could be obtained by treating forest tree seeds with fungicides. Like seeds of other plants, tree seeds also have many fungi and bacterial enemies that inhabit the earth. These destructive agencies commonly destroy a considerable portion of the planted seeds. Successful measures to combat these losses would save considerable quantities of high priced seed.

During 1951 and 1952 a small pilot experiment was carried out to determine the results of using one of the many seed fungicides on forest tree seeds. The results after one growing season are quite encouraging, as shown in the table below.

To conduct this experiment sixteen pounds of hemlock seed were treated during the fall of 1951 and sowed at that time. Twenty-four pounds of Norway spruce and eight pounds of red pine were treated during the spring of 1952 and planted at that time. Except for using untreated seed all check beds were identical to the beds in which treated seed was planted. The number of seedlings per square foot were counted September 18, 1952, after all seedlings had nearly completed one growing season.

One -half teaspoon of a commercial product (Tetramethylthiuram disulphide) was used to treat each pound of seed. Successful uses of numerous other seed treating chemicals have been reported and are no doubt commonly experienced. The chemical, in powder form, was placed in a container with the seed and the two were thoroughly mixed. Applying the chemical as a slurry would, no doubt, give even better results. Expanded research will give the answers to the difference between powder mixing and the slurry method of treatment.

This experiment indicates that large quantities of high priced and sometimes scarce forest tree seed could be saved by properly using relatively inexpensive seed treating chemicals. Costly failures due to damping-off and the destruction of the seeds by soil-inhabiting organisms before they germinate can possibly be avoided.

Before forest tree seeds can be treated in the most efficient way considerable research remains to be carried out. Approximately fifty chemicals that are currently being used to treat seed should be tried on the seeds of species commonly grown in forest tree nurseries.

**NUMBER OF SEEDLINGS SURVIVING AFTER ONE GROWING SEASON
FROM TREATED AND UNTREATED SEEDS**

Species	No. of seedlings per sq. ft. in		Per cent increase in favor of Treated Seed
	Untreated Beds	Treated beds	
Hemlock	240	344	43%
Norway Spruce	228	336	47%
Red Pine	120	140	17%

Note: All field work necessary for this experiment, incidentally, was carried out by Harry E. Staley, the principal nurseryman at the Mont Alto State Forest Nursery.