

SEED TREATMENT *for* PEANUTS¹

COYT WILSON, Plant Pathologist

POOOR stands of peanuts, which cut growers' profits, may be caused by one of several conditions. Seed rot, however, is one of the most common causes of poor stands.

Much of the seed rot can be prevented by treating seed with the proper disinfectant (chemical compound). The results given here are from 5 years' work at the Alabama Agricultural Experiment Station. They are similar to results obtained by other investigators working on the same problem.

VALUE of SEED TREATMENT

High yields of peanuts are dependent on good stands (Figure 1). Soil fertility, growing conditions, insect and disease damage, and weather conditions during

1. Original printing 3M, January 1947.
Revision 5M, January 1948.

harvest time influence total yields. However, high yields cannot be expected from fields of poor stands. Treating the seed with a chemical seed disinfectant may mean the difference between good and poor stands of peanuts.

WHAT IT DOES

Seed treatment serves two purposes. The disinfectant kills the organisms present on the seed surface that cause seed-rotting and seedling disease. It also protects the seed against similar organisms that are present in the soil.

This latter protection is especially important on machine-shelled seed, because seed coats are broken frequently by the machine. Unless the seed are covered by a disinfectant, broken skins are ideal places for entrance of seed-rotting organisms.



FIGURE 1. High peanut yields never result from poor stands. Note the difference in stands from untreated seed at the left and treated seed at the right.

AGRICULTURAL EXPERIMENT STATION
of the ALABAMA POLYTECHNIC INSTITUTE

M. J. Funchess, Director

Auburn, Alabama

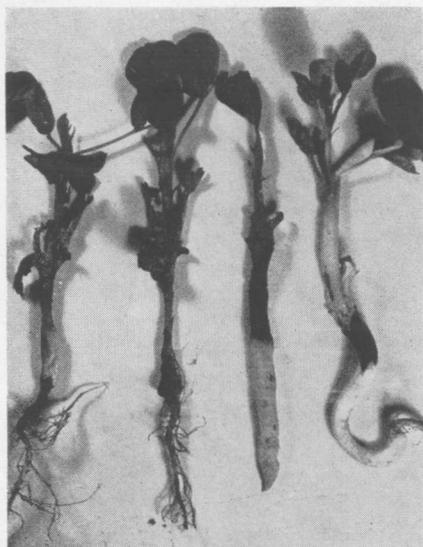


FIGURE 2. Seed treatments do not prevent seedling blights and root rots of peanuts, as shown above. However, seed treatments do result in more seedlings. Thus, damages from seedling blights and root rots are reduced.

This protection during germination also gives the young seedling a better chance to become established before disease organisms attack and produce stem and root rots similar to those shown in Figure 2. Since seed treatment usually results in more plants, the loss of a few from seedling blights is not as serious in stands from treated seed as in those where untreated seed are planted and stands are weak.

MACHINE vs. HAND-SHELLING

Treatment is more important on machine-shelled seed than on either hand-

shelled or unshelled seed. Good stands usually can be obtained from hand-shelled seed without treatment. Treating such seed results in only 5 to 10 per cent more seedlings. Treatment of machine-shelled seed usually increases the number of plants from 30 to 50 per cent.

Unshelled seed generally yield poor stands, and treatment causes very little improvement. These facts are shown in Table 1.

MATERIALS USED

A number of different seed-treating materials have been tested on both Spanish and runner peanuts. All of the materials have improved the stands, but some have given better results than others. The response to seed treatment of Spanish and runners is about the same. Table 2 summarizes the results obtained at the Main Station, Auburn, over a period of 5 years.

Two per cent Ceresan and DuBay 1452-F have been two of the best treatments throughout the tests. However, these materials contain mercury and are poisonous. They must be handled with caution, and seed treated with either of these should be planted or destroyed. In addition to the danger to people and livestock, there is the hazard of using too much of these materials on the seed. Overdosage with any mercury compound causes abnormal germination. The first root becomes greatly enlarged, root branching is retarded, and the young leaves develop very slowly. Quite frequently these seedlings die. Such symptoms are shown by the plants in Figure 3.

TABLE 1. EFFECT OF METHOD OF SHELLING AND SEED TREATMENT ON EMERGENCE OF SPANISH PEANUTS, AUBURN, ALABAMA, 1943-44

Method of shelling	Disinfectant	Average number of plants from 100 seeds
Not shelled	None	58
Not shelled	2% Ceresan	60
Hand-shelled	None	72
Hand-shelled	2% Ceresan	84
Machine-shelled	None	50
Machine-shelled	2% Ceresan	79

TABLE 2. EFFECT OF VARIOUS SEED DISINFECTANTS UPON EMERGENCE OF MACHINE-SHELLED SPANISH AND RUNNER PEANUTS AT MAIN STATION, AUBURN, ALABAMA

Disinfectant	Rate of application per 100 pounds of shelled seed	Average number of plants from 100 seeds	
		Spanish	Runners
	Ounces	Per cent	Per cent
None	---	48	58
Merc-O-Dust	3	69	67
Dow 9B	3	---	71
Yellow Cuprocide	4	65	73
Spergon	4	66	79
Arasan	3	71	83
Phygon	2	62	80
Ceresan, 2%	4	78	87
DuBay 1452-F	1½	86	85

New improved Ceresan should never be used, because it contains 5 per cent of the mercury compound. Injuries to the seed are almost certain to result from use of this compound.

DuBay 1452-F is now on the market under the name of Ceresan M. When used at 1½ ounces per 100 pounds of seed, it has been very satisfactory, but it should be used with caution. Overdosage may cause mercury injury. Spergon and Arasan are reliable materials that are not dangerous to handle. They do not cause injuries to the germinating seed, even when used in excess. The two materials appear to be about equally effective under Alabama conditions.

Spergon is not dusty and is not irritating to the eyes or nasal passages. Arasan is more disagreeable to handle, but is less expensive than Spergon. Phygon is easily handled and is quite effective. The dangers of overtreatment with this material have not been investigated. Dow 9B was not as effective on runner peanuts as other tested materials. It has a disagreeable odor, but it is not as dangerous to handle as the mercurial treatments.

WHEN to TREAT

Seed may be shelled and treated during the winter months when labor is more abundant. In tests conducted at the Main



FIGURE 3. Shown here is mercury injury to germinating peanuts. The six seedlings at the right were treated with an overdose of Ceresan. Note the enlarged first roots. The two at the left are from seed treated at the recommended rate.

Station,² seed shelled and treated 9 weeks before planting have produced stands as good as those shelled and treated one day before planting. These tests have been in progress for 3 years. In no instance has there been any significant difference in the stands obtained from seeds shelled on the different dates. The results given in Table 3 were obtained in 1946; they are in agreement with those obtained in earlier years in other tests.

After the seed are shelled and treated, they should be stored in a dry place. Under such conditions they will keep for several months. Seed shelled, treated, and stored in screened cages at Auburn have germinated as well 15 months after shelling as they did at the time they were shelled. Usually, though, it is impractical to carry treated seed over from one year to another because of the webworms that get into seed.

HOW TO TREAT

The method used to apply the disinfectant will depend upon the volume of seed

2. All machine-shelled seed used in these experiments were shelled by the USDA Tillage Machinery Laboratory, Auburn, Ala., on a portable sheller designed and built by that laboratory.

to be treated. Whatever method is used, it should insure uniform distribution of the disinfectant over every seed. For greatest efficiency each seed should be coated with a film of the chemical dust. Some disinfectants will evaporate, and the vapors that enter the sack of seed will kill the disease-producing organisms on the seed. However, the seed will be re-infected as soon as they are placed in the ground, unless covered with the disinfectant. Thorough coverage is especially important on machine-shelled seed.

Most commercial peanut shellers are equipped to treat seed. If the grower has access to a reliable sheller, it is usually more practical to buy treated seed or to have the sheller treat the seed at the time they are shelled.

For the grower who wishes to shell and treat his own seed, the rotary seed treater or one of the gravity seed treaters is satisfactory.³

Always *plainly label* treated seed and use them only for planting. Treated seed *should not be used for human food, livestock feed, or sold to oil mills.*

3. Details for construction of these seed treaters may be obtained from the Agricultural Experiment Station, Auburn, Alabama.

TABLE 3. EFFECT OF TIME OF SHELLING AND SEED TREATMENT ON THE EMERGENCE OF HAND-SHELLED AND MACHINE-SHELLED RUNNER PEANUTS

Method of shelling	Seed treatment	Time elapsing between shelling and planting			
		Nine weeks	Six weeks	Three weeks	One day
		<i>Per cent</i>	<i>Per cent</i>	<i>Per cent</i>	<i>Per cent</i>
Hand.....	None	71	80	80	80
Hand.....	2% Ceresan	85	86	82	86
Machine.....	None	64	64	51	44
Machine.....	2% Ceresan	80	79	83	80