

PEANUT SEED TREATMENT TESTS IN TEXAS

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SUMMARY

Results of tests of peanut seed protectants conducted at Stephenville, Yoakum, Stockdale and College Station justify recommending the following materials at the rates indicated (ounces per 100 pounds of shelled seed) as satisfactory and effective seed protectant fungicides for peanuts: Arasan (50 or 75 percent active), 2 oz. per cwt.; Delsan, 3 oz. per cwt.; compounds containing 50 percent captan, such as Captan 50W, Orthocide 406 or Orthocide 50, 12 oz. per cwt.; compounds containing 75 percent captan, such as Orthocide 75 Seed Protectant, 6 oz. per cwt.; Manzate, a 65 percent wettable maneb powder, 6 oz. per cwt.

Promise is indicated for liquid organic mercury seed protectants and other new materials in preliminary tests, which will be continued.

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Seed treatment tests with peanuts have been conducted annually at the West Cross Timbers Experiment Station, Stephenville, since 1940, at the Plant Disease Laboratory, Yoakum, since 1949, at Stockdale since 1949 and at College Station since 1951. The same treatments have been tested at all four locations since 1953, and a single lot of machine-shelled seed was used throughout. A quantity of non-treated No. 1 machine-shelled seed was subdivided into the number of batches required for the treatments to be tested that year. Treatments were applied by one operator and the treated batches were further subdivided into packet-size quantities to be sent to the four locations for planting in field tests.

Results of tests in the first decade and practical recommendations developed therefrom were published (1,2,3). The tests continue to be held open annually to new seed protectant fungicides submitted by manufacturers. Until 1957, only materials suitable for application as dusts were admitted to the tests, because under ordinary conditions the wetting of the fragile peanut seed coat is damaging. The recent advent of a new type of liquid organic mercury seed protectant, with which adequate coverage or distribution is said to be realized without appreciably wetting the seed, has permitted this class of materials to be considered. Liquid mercury seed protectants were emphasized in the 1957 tests.

Peanuts ordinarily are planted in thoroughly warm, well-drained soil. Seedlings emerge rapidly and vigorously. Pre and post-emergence damping-off appear to be generally much less important with peanuts than with many other crops. The principal loss in potential stands of peanuts comes from outright decay of un-sprouted seed in the ground, a process that is greatly abetted by the often inconspicuous abrasions and breaks made in the seed coat during machine shelling. Thus

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the effectiveness of each protectant was measured in terms of how much average increase in stand of established peanut plants could be associated with its use, compared with stands in similar plots planted with nontreated seed.

In the earlier reports cited (1,2,3), three protectants were recommended as satisfactory: 2 percent Ceresan, 3 oz. per cwt.; Arasan (50 percent active), 2 oz. per cwt.; and Spergon, 3 oz. per cwt. Since 1950, a considerable number of materials not then available have been tested.

This report summarizes the trend of results since 1951, adding several materials to the list of recommended peanut seed protectants, and to present samples of representative data in the tables.

Results

The largest test in the series was in 1953. Results are summarized in Table 1, in which the 40 treatments are arrayed in order of average stands for all locations.

The tests continued on the same basis during 1954-56, retaining for emphasis those materials that had shown superior effectiveness in earlier years and adding new compounds as they appeared. Table 2 represents average stands in the 1956 tests at College Station, Yoakum and Stephenville, which were typical of the tests of that period. With only minor variations, there was very close agreement among locations and from year to year during this 3-year period. As shown in Table 2, all test compounds were significantly better than the nontreated checks.

The new liquid organic mercury seed protectants were introduced into the tests in 1957. The type of test reported gives a reasonable assessment of the value of such materials as seed protectant fungicides. Excellent distribution of the liquids over seed surfaces was obtained by the small-scale laboratory procedures used, and dosages were administered accurately. Such tests do not, however, answer the important questions relating to moistening of seed surfaces and possible resulting slippage of seed coats during movement of heavy weights of peanuts in commercial machinery.

Table 3 presents data from the 1957 College Station, Stockdale, Yoakum and Stephenville tests. Stands in nontreated check plots were abnormally high in all locations, suggesting that the lot of shelled seed purchased was unusually free from surface abrasions and breaks. The three liquid mercury compounds tested, Chipman BB-67, DuPont Ceresan 100 and Panogen 15, were shown to be in the same class of fungicidal effectiveness as the older material, Arasan, as were the new non-mercurial experimental materials, Chemagro B-1843 and D-113.

Discussion

Continuing annual tests of seed protectant fungicides since the last report in 1950 (3) have further confirmed the value of 2 percent Ceresan and Arasan for use with peanuts. In the same category of effectiveness are 50 percent formulations of captan, such as Orthocide 406 and Captan 50W, at 12 oz. per cwt. of shelled seed; 75 percent formulations of captan, such as Orthocide 75 Seed Protectant, at 6 oz. per cwt.; Arasan 75, similar to the older 50 percent Arasan, except with 75 percent active ingredient (thiram), at 2 oz. per cwt.; Delsan, a thiram formulation having also an insecticide, at 3 oz. per cwt.; Manzate, a 65 percent wettable maneb powder, at 6 oz. per cwt. All are available commercially, except

Table 1. Summary of average peanut stand counts at College Station, Stockdale, Yoakum and Stephenville, 1953

Name of compound	Rate, oz. per cwt.	Average percent stands				Com- bined
		College Station	Stock- dale	Yoakum	Stephen- ville	
Puratized C12-2525	8	70	84	80	94	82
Orthocide 406	12	74	76	84	90	81
Vancide F995W	6	73	77	82	90	80
2% Ceresan	3	68	78	83	92	80
Vancide 51ZW	6	65	79	84	92	80
Manzate	4	72	75	82	88	79
Manzate	6	70	76	85	87	79
CCC 224	6	71	68	87	91	79
Orthocide 75 Seed Protectant	6	70	77	76	93	79
Puratized C12-2525	4	71	73	78	93	79
Orthocide 75 Seed Protectant	9	68	72	80	94	78
Vancide F995W	3	66	72	82	92	78
Ortho Seed Guard	12	78	66	79	89	78
Orthocide 75 Seed Protectant	3	69	71	80	89	77
Puratized C15-127	4	67	69	79	93	77
CCC 5400	8	61	73	83	89	76
Aagrano 350	3	62	73	84	86	76
CCC 224	4	61	68	84	91	76
Puratized C15-1212	4	65	70	77	92	76
Vancide 51ZW	3	62	73	75	91	75
Arasan 50%	2	56	75	82	87	75
Puratized C15-127	2	52	73	78	92	74
Puratized C13-1212	2	62	74	74	84	73
Puratized C15-1212	2	48	73	76	95	73
Thiram 50	2	61	61	78	91	73
Puratized C13-1212	1	54	69	77	91	73
Arasan SF-X (75%)	2	54	68	79	89	72
CCC 5400	4	58	63	80	87	72
Puratized C4-10	4	54	71	68	94	72
Puratized C15-1212	1	47	72	74	92	71
DuPont I. & D.	2	53	62	75	82	68
Pentachloronitrobenzene 75%	4	37	69	84	77	67
CCC 224	2	51	56	69	88	66
Sperton	3	56	56	71	73	64
Pentachloronitrobenzene 75%	8	31	62	73	86	63
Puratized C2-12	5	43	58	71	78	62
Phygon	3	48	59	73	66	61
Puratized C4-10	6	62	47	29	91	57
Puratized C2-12	4	39	49	66	75	57
Check (no treatment)		21	37	54	54	41

Table 2. Summary of average peanut stand counts in 1956 at College Station, Yoakum and Stephenville with seed protectants selected on the basis of tests ending in 1953

Name of compound	Rate, oz. per cwt.	Average percent stands			
		College Station	Yoakum	Stephenville	Com- bined
Delsan A-D	3	58	88	50	65
Orthocide 75 Seed Protectant	6	54	86	54	65
Ortho Seed Guard	12	54	86	54	65
Captan 50W	12	57	84	55	65
Manzate	6	60	86	47	64
Puratized C12-2525	4	56	85	52	64
Chemagro B-1843	6	51	82	52	64
Arasan 50	2	57	86	47	63
Chemagro B-1843	8	56	83	49	63
Arasan 75	2	54	87	44	62
2% Ceresan	3	55	82	49	62
Arasan SF-X	2	50	84	46	60
Phygon	3	49	79	51	60
Chemagro B-1843	4	54	69	53	59
Sperguson	3	49	71	35	52
Check (no treatment)		36	62	35	44

Table 3. Summary of average peanut stands in 1957 at College Station, Stockdale, Yoakum and Stephenville with new seed protectants

Name of compound	Rate, oz. per cwt.	Average percent stands				
		College Station	Stockdale	Yoakum	Stephenville	Com- bined
Panogen 15	1	88	89	92	63	83
Chipman BB-67	1/2	88	90	92	61	83
Arasan SF-X	2	85	91	92	62	82
Panogen 15	1/2	81	89	90	69	82
Chipman BB-67	2	86	93	89	57	81
Chipman BB-67	1	86	91	91	58	81
Ceresan 100	1/2	85	92	90	57	81
Ceresan 100	2/3	88	84	88	61	80
Panogen 15	2	84	87	88	61	80
Chemagro B-1843	4	83	92	89	56	80
Ceresan 100	1	81	82	90	60	78
Chemagro D-113	1-1/2	81	83	87	56	77
Chemagro D-113	3/4	83	82	88	53	76
Chemagro D-113	1/4	73	89	86	49	74
Check (no treatment)		74	79	82	50	71

2 percent Ceresan, which has been discontinued by the manufacturer. They have been tested sufficiently that they can be recommended as equally effective and satisfactory as peanut seed protectant fungicides. The experimental organic mercury compound, Puratized Cl2-2525, has been satisfactory consistently in numerous tests when applied as a dust at 4 oz. per cwt. It is not known to be available commercially.

Results from 1 year of testing indicate that the three liquid mercury protectants, Ceresan 100, Chipman BB-67 and Panogen 15, as well as the two new Chemagro materials, B-1843 and D-113, have promise of utility and effectiveness for use with peanuts. Testing of these and other new seed protectants will be continued as they appear.

Publications Cited

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