

## § 201.52

- (2) Other crop seed.
- (3) Inert matter.
- (4) Weed seed.

(f) The de-coated seed shall be separated into four components in accordance with §§ 201.48 through 201.51. §§ 201.51a (a) and (b) shall not be followed. The weight of the coating material is determined by subtracting the sum of the weights of the other four components from the original weight of the working sample. The percentage of coating material shall be included with the inert matter percentage. Calculate percentages of all components based on the original weight of the working sample (see paragraph (a) of this section).

[59 FR 64499, Dec. 14, 1994]

### § 201.52 Noxious-weed seeds.

(a) The determination of the number of seeds, bulblets, or tubers of individual noxious weeds present per unit weight should be made on at least the minimum quantities listed in § 201.46 Table 1: *Provided*, That if the following indicated numbers of a single kind of seed, bulblet, or tuber are found in the pure seed analysis (or noxious-weed seed examination of a like amount) the occurrence of that kind in the remainder of the bulk examined for noxious-weed seeds need not be noted: ½-gram purity working sample, 16 or more seeds; 1-gram purity working sample, 23 or more seeds; 2-gram purity working sample or larger, 30 or more seeds. The seeds per unit weight shall be based on the number of single seeds. The number of individual seeds shall be determined in burs of sandbur (*Cenchrus* spp.) and cocklebur (*Xanthium* spp.); in capsules of dodder (*Cuscuta* spp.); in berries of groundcherry, horsenettle, and nightshade (Solanaceae); and in the fruits of other noxious weeds that contain more than one seed. Refer to §§ 201.50 and 201.51(b)(4) for the classification of weed seeds and inert matter, respectively.

(b) A noxious-weed seed examination of coated seed samples shall be made by examining approximately 25,000 units obtained in accordance with § 201.46(d) and which have been de-coat-

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ed by the method described in § 201.51b(c).

[59 FR 64499, Dec. 14, 1994]

### GERMINATION TESTS IN THE ADMINISTRATION OF THE ACT

### § 201.53 Source of seeds for germination.

(a) When both purity and germination tests are required, seeds for germination shall be taken from the separation of the kind, variety, or type considered pure seed and shall be counted without discrimination as to size or appearance.

(b) When only a germination test is required and the pure seed is estimated or determined to be at least 98 percent, the pure seed for the germination test may be taken indiscriminately from a representative portion of the bulk.

(c) When only a germination test is required and the pure seed is found to be less than 98 percent, the seed for the test shall be obtained by separating the sample into two components as follows: (1) Pure seed and (2) other crop seed, weed seed, and inert matter. In making this separation at least ¼ of the quantity required for a regular purity analysis shall be used. The whole sample must be well mixed and divided in such a manner as to get a completely representative subsample.

[10 FR 9952, Aug. 11, 1945, as amended at 20 FR 7931, Oct. 21, 1955]

### § 201.54 Number of seeds for germination.

At least 400 seeds shall be tested for germination; except that in mixtures, 200 seeds of each of those kinds present to the extent of 15 percent or less may be used in lieu of 400, in which case an additional 2 percent is to be added to the regular germination tolerances. The seeds shall be tested in replicate tests of 100 seeds or less.

[59 FR 64500, Dec. 14, 1994]

### § 201.55 Retests.

Retests shall be made as follows:

(a) When the range of 100-seed replicates of a given test exceeds the maximum tolerated range in the table appearing in this section.

TABLE OF MAXIMUM TOLERATED RANGES BETWEEN 100-SEED REPLICATES FOR USE IN CONNECTION WITH § 201.55(A)

| Average percent germinations | Maximum allowed between replicates |              |
|------------------------------|------------------------------------|--------------|
|                              | 4 replicates                       | 2 replicates |
| 99 .....                     | 2                                  | 5            |
| 98 .....                     | 3                                  | 6            |
| 97 .....                     | 4                                  | 7            |
| 96 .....                     | 5                                  | 8            |
| 95 .....                     | 6                                  | 9            |
| 94 .....                     | 7                                  | 10           |
| 93 .....                     | 8                                  | 10           |
| 92 .....                     | 9                                  | 11           |
| 91 .....                     | 10                                 | 11           |
| 90 .....                     | 11                                 | 12           |
| 89 .....                     | 12                                 | 12           |
| 88 .....                     | 13                                 | 13           |
| 87 .....                     | 14                                 | 13           |
| 86 .....                     | 15                                 | 14           |
| 85 .....                     | 16                                 | 14           |
| 84 .....                     | 17                                 | 14           |
| 83 .....                     | 18                                 | 15           |
| 82 .....                     | 19                                 | 15           |
| 81 .....                     | 20                                 | 15           |
| 80 .....                     | 21                                 | 16           |
| 79 .....                     | 22                                 | 16           |
| 78 .....                     | 23                                 | 16           |
| 77 .....                     | 24                                 | 17           |
| 76 .....                     | 25                                 | 17           |
| 75 .....                     | 26                                 | 17           |
| 74 .....                     | 27                                 | 17           |
| 73 .....                     | 28                                 | 17           |
| 72 .....                     | 29                                 | 18           |
| 71 .....                     | 30                                 | 18           |
| 70 .....                     | 31                                 | 18           |
| 69 .....                     | 32                                 | 18           |
| 68 .....                     | 33                                 | 18           |
| 67 .....                     | 34                                 | 18           |
| 66 .....                     | 35                                 | 19           |
| 65 .....                     | 36                                 | 19           |
| 64 .....                     | 37                                 | 19           |
| 63 .....                     | 38                                 | 19           |
| 62 .....                     | 38                                 | 19           |
| 61 .....                     | 40                                 | 19           |
| 60 .....                     | 41                                 | 19           |
| 59 .....                     | 42                                 | 19           |
| 58 .....                     | 43                                 | 19           |
| 57 .....                     | 44                                 | 19           |
| 56 .....                     | 45                                 | 19           |
| 55 .....                     | 46                                 | 20           |
| 54 .....                     | 47                                 | 20           |
| 53 .....                     | 48                                 | 20           |
| 52 .....                     | 48                                 | 20           |
| 51 .....                     | 50                                 | 20           |

(b) When at the time of the prescribed final count there are indications, such as presence of firm ungerminated seeds, that a satisfactory germination has not been obtained;

(c) When there is evidence that the results may not be reliable due to improper test conditions, errors in seedling evaluation, the presence of fungi

or bacteria, or inaccuracies in counting or recording results;

(d) When a sample shows seedling injury or abnormality as a result of chemical treatment, of exposure to chemicals, or of toxicity from any source. (Retest shall be made in soil or a mixture of soil and sand);

(e) When no two satisfactory tests are within tolerance.

## § 201.55a

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NOTE TO § 201.55: To find the maximum tolerated range, compute the average percentage of all 100 seed replicates of a given test, rounding off the result to the nearest whole number. The germination is found in the first two columns of the table. When the differences between highest and lowest replicates do not exceed the corresponding values found in the "4 replicates" column, no additional testing is required. However, if the differences exceed the values in the "4 replicates" column, retesting is necessary.

[25 FR 8771, Sept. 13, 1960, as amended at 65 FR 1707, Jan. 11, 2000]

### § 201.55a Moisture and aeration of substratum.

(a) The substratum must be moist enough to supply the needed moisture to the seeds at all times. Excessive moisture which will restrict aeration of the seeds should be avoided. Except as provided for those kinds of seeds requiring high moisture levels of the germination media, the substrata should never be so wet that a film of water is formed around the seeds. For most kinds of seeds blotters or other paper substrata should not be so wet that by pressing, a film of water forms around the finger.

(b) The following formula may be used as a guide in the preparation of sand for germination tests:

[118.3 CC. (1 GILL) SAND/ITS WEIGHT IN GRAMS]×20.2-8.0=THE NUMBER OF CC. OF WATER TO ADD TO EACH 100 GRAMS OF AIR-DRY SAND.

(c) The amount of water provided by this formula is satisfactory for seeds the size of clovers and will have to be modified slightly, depending on the kind of seed being tested and the kind of sand used. For example, slightly more moisture should be added when the larger seeds are to be tested.

(d) In preparing soil tests water should be added to the soil until it can be formed into a ball when squeezed in the palm of the hand but will break freely when pressed between two fingers. After the soil has been moistened it should be rubbed through a sieve and put in the seed containers without packing.

(e) The addition of water subsequent to placing the seed in test will depend on the evaporation from the substrata in the germination chambers. Since the

rate of evaporation will depend upon the relative humidity of the air, it is desirable to keep water in the germination chambers or to provide other means of supplying a relative humidity of approximately 95 percent. Germination tests should be observed at frequent intervals to insure an adequate moisture supply of the substrata at all times.

[20 FR 7931, Oct. 21, 1955]

### § 201.56 Interpretation.

(a) A seed shall be considered to have germinated when it has developed those essential structures which, for the kind of seed under consideration, are indicative of its ability to produce a normal plant under favorable conditions. In general, the following are considered to be essential structures necessary for the continued development of the seedling (although some structures may not be visible in all kinds at the time of seedling evaluation). Seedlings possessing these essential structures are referred to as normal seedlings: Root system (consisting of primary, secondary, seminal, or adventitious roots); hypocotyl; epicotyl; cotyledon(s); terminal bud; primary leaves; and coleoptile and mesocotyl (in the grass family). Abnormal seedlings consist of those with defects to these structures, as described in the abnormal seedling descriptions, and are judged to be incapable of continued growth. The seedling descriptions assume that test conditions were adequate to allow proper assessment of the essential seedling structures.

(b) Sand and/or soil tests may be used as a guide in determining the classification of questionable seedlings and the evaluation of germination tests made on approved artificial media. This is intended to provide a method of checking the reliability of tests made on artificial substrata when there may be doubt as to the proper evaluation of such tests.

(c) Seedlings infected with fungi or bacteria should be regarded as normal if all essential structures are present. A seedling that has been seriously damaged by bacteria or fungi from any source other than the specific seed should be regarded as normal if it is determined that all essential structures