

April 2021

Procedure for Cold Test for Cotton

C. C. Baskin

Follow this and additional works at: <https://scholarsjunction.msstate.edu/seedtechpapers>

Recommended Citation

Baskin, C. C., "Procedure for Cold Test for Cotton" (2021). *Seed Technology Papers*. 135.
<https://scholarsjunction.msstate.edu/seedtechpapers/135>

This Text is brought to you for free and open access by Scholars Junction. It has been accepted for inclusion in Seed Technology Papers by an authorized administrator of Scholars Junction. For more information, please contact jshedd@library.msstate.edu.

Procedure for Cold Test for Cotton $\frac{1}{2}$

by

Charles C. Baskin
Assistant Agronomist

1. Soil Selection and Screening

Soil from a field that has been previously planted to cotton is screened through a series of grain dockage sieves, the smallest of which is a $\frac{1}{12}$ round hole screen, to remove crop residue, lumps of soil, etc.

2. Soil Mixing

This screened soil is then mixed with builders sand, $\frac{1}{2}$ soil $\frac{1}{2}$ sand by volume. (Mixing may be done with any equipment as long as sand and soil are well mixed).

3. Planting

Plastic crispers $7 \frac{9}{16}$ " X $10 \frac{3}{8}$ " X $3 \frac{3}{4}$ " are used for planting seed, 1500 grams of soil are placed in each container. The soil is leveled, then seed are placed on top of the soil-sand mixture, 2 replications of 50 seed each per container. The seed are then covered with an additional 1000 grams of soil-sand mixture. The soil is then firmed by pressing. A specified amount of water is added to each container. (This type and size container was selected for ease of handling and convenience. Any type container may be used as long as it can be covered during the cold period.

4. Cold Period

The container is covered and placed at 50° to 52° F. for 72 hours.

$\frac{1}{2}$ Developed by Mississippi State University Seed Technology Laboratory. Principal development by Dr. J. D. Helmer, Ph. D. resigned.

5. Emergence

After Chilling the containers are moved to a greenhouse for emergence. In cold weather the temperature is maintained at a sufficiently high temperature for seedling growth. In the spring and summer no attempt is made to regulate temperature (from April 15 to October 1).

6. Evaluation

After 7 to 10 days the emerged seedlings are counted and classified normal, damped-off or abnormal. When calculating the percent normal seedlings, normal + damped seedlings is compared to a standard germination test for a vigor rating.

7. Determining amount of water to add

To determine the amount of water to add to each container, the percent moisture of the soil-and mix at saturation is determined. This is done by filling two, containers about the size of number 2 metal cans approximately 1/2 full of the soil-san mixture. Water is slowly added to each container until it drips from the cans through the perforated bottom. A small amount of wet soil is taken from each can, weighed and dried at 130° C. for 24 hours, then weighed again. The percent moisture is calculated on a dry soil weight basis. This percentage is considered to be the saturation percentage.

The soil-sand mixture in which the seed are planted is adjusted to 60 percent of saturation before placing the seed in the cold room.

The moisture of the soil-sand mixture is determined by drying a soil sample for 24 hours at 130° C. and calculating the percent moisture on a dry soil basis.

Attached is an example of how the calculations are made to determine the amount of water to add to each container.

Saturation determined to be

25.6%
60%

15.4 % moisture soil will be adjusted to

2500 grams of soil used

Initial moisture determined to be 3.7% (.037)

Final % moisture = $\frac{\text{Water}}{\text{dry weight}}$

Dry weight = 2500 - W

$$.037 = \frac{W}{2500 - W}$$

$$W = .037 (2500 - W)$$

$$W = 92.5 - .037W$$

$$1.037W = 92.5$$

$$W = \frac{92.5}{1.037}$$

W = 89.2 grams or ml. of moisture initially in soil-sand mix.

2500.0 grams of soil used

89.2 grams of water in mix

2410.8 grams of dry soil

Final % moisture = $\frac{\text{water}}{\text{dry weight}}$

$$.154 = \frac{\text{water}}{2410.8}$$

Water = 371.3 grams (ml)

89.2 grams water in soil

282.1 grams (ml) to add to each container

Prepared by Seed Technology Laboratory
Mississippi State University and
Mississippi Agricultural Experiment Station
State College, Mississippi