THE EFFECT OF INERT COATINGS ON THE GERMINATION AND SEEDLING GROWTH OF COTTON

One of the major problems in cotton production is obtaining uniform stands of healthy seedlings. A contributing factor to unsatisfactory stands is the use of fuzzy cottonseed which, as they come from the ginning process, are covered with a certain amount of short fibers. These fibers cause the seed to mat together; hence, when dropped from the planter box they fall in irregular clusters rather than as a single seed. This causes erratic stands and the planting of many times the number of seeds actually needed for an adequate stand.

The coating of fuzzy cottonseed with inert materials to obtain seeds which have smooth surfaces and which disperse easily may be one means of getting more uniform stands of cotton. The purpose of this study was to determine the effects of two such coatings upon the germination and seedling growth of cotton.

Many materials have been used as artificial coating for seeds to produce a desired shape and size; Rudolf lists some 15 such compounds ranging from clay to ground glass. Vogelsang et al. have more recently developed a satisfactory coating of feldspar and flyash (a product from the burning of powdered coal in boiler installations) for sugar beets for the purpose of obtaining a smooth pellet, making precision planting possible. Burgesser found a volcanic montmorillonite clay to be a satisfactory material for coating certain vegetable, flower, and cotton seed. Methyl cellulose was selected as the most suitable binding material by both Vogelsang and Burgesser.

In the study reported here, fuzzy cottonseed of the variety, Stormmaster, were coated with: (a) lot 1, a montmorillonite clay from California, (b) lot 2, a mixture of 65% ground feldspar and 35% flyash, (c) lot 3, the original seed, uncoated. All seeds were treated with a suitable fungicide prior to initiation of the study. Germination tests were made in the Texas State Seed Laboratory, Lubbock, Texas, in accordance with the Texas Seed Law and Regulations; in the greenhouse in flats of Amarillo fine sandy loam; and with the same soil in the field in duplicate 100-foot rows. Four replications and complete randomization were used in all studies.

Seedling growth rate was measured by growing 10 plants to an age of 18 days in 4-gallon glazed pots of quartz sand, after which the roots and tops were removed, oven-dried, and weighed separately.

Data in Table 1 show that the use of coatings changed the rate of germination of cottonseed in the germinator and in flats of soil in the greenhouse but under field conditions no significant differences were obtained.

When compared to the germination of the fuzzy seed (standard), the feldspar-flyash-coated cottonseed gave no significant differences in germination in the field or greenhouse. A highly significant increase in percentage germination resulted in the laboratory germinator. This difference was due in part to the better control of mold and damping-off organisms with this coating material.

Cottonseed coated with the "montmorillonite clay" showed no significant difference from uncoated seed in percentage germination in the field, however, in the laboratory germinator a significant increase was obtained and in the greenhouse a significant decrease was obtained. In tests made after a 1-year storage period this treatment showed a 7% drop in germination percentage while the feldspar-flyash and the standard fuzzy seed showed 3% and 7% increases, respectively.

The speed of germination was unchanged by the feldspar-flyash coatings but the montmorillonite clay coatings delayed germination from 3 to 7 days under all conditions. When grown in washed quartz sand, seedlings from all coated seeds averaged 30% more dry weight than seedlings from standard fuzzy seed at the end of 2 weeks of growth. However, under field conditions seedlings from fuzzy seed appeared to be healthier and more uniform than those from coated seed.---COLEMAN Y. WARD and A. W. YOUNG, Formerly Instructor of Agronomy (now Assistant Agronomist, Virginia Agr. Exp. Sta.) and Professor and Head of Department of Agronomy, Texas Technological College, Lubbock, respectively.

### Table 1—Influence of two inert coatings on the germination of fuzzy cottonseed.

<table>
<thead>
<tr>
<th>Coating materials</th>
<th>In germinator</th>
<th>In greenhouse</th>
<th>In field</th>
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<tbody>
<tr>
<td>Montmorillonite clay†</td>
<td>80**</td>
<td>71</td>
<td>36</td>
</tr>
<tr>
<td>Fieldspary-flyash‡</td>
<td>85**</td>
<td>77</td>
<td>36</td>
</tr>
<tr>
<td>Fuzzy seed (check)</td>
<td>71</td>
<td>76</td>
<td>42</td>
</tr>
</tbody>
</table>

1 Supplied by the Filtrol Corp., Vernon, Calif., from a California deposit.
2 65% feldspar and 35% flyash, supplied by Processed Seeds, Inc., Midland, Mich.
3 Difference from check value is highly significant.

A SIMPLE and effective mounting for a cone-type nursery planter was recently devised in connection with the barley project at the University of Minnesota. The planter is mounted on an Allis Chalmers 'G' tractor, as shown in figure 1. The cone mechanism was custom-made, but otherwise standard equipment was used. With 2-, 3-, or 4-row plots the tractor wheels served as a guide marker for the following rows. A uniform planting depth was maintained by the hydraulic lift despite irregularities in the soil; and the standard cultivating equipment for this tractor eliminated practically all hand hoeing.

The machine may be operated by one man if necessary, but operation by two men facilitates progress. A man sitting on the seat at the front of the tractor pours the seed into the boxes, while the other man drives the tractor. The box containing the seed packets is held within easy reach by a bracket mounted on the bar that holds the planter boxes, and the empty envelopes are put into a cloth bag that is hooked on to the tractor.

The main source of trouble with the cone-type planter is the removal of the seeds from the base of the cone.

1 Published as paper No. 4169, Scientific Journal Series, Minnesota Agricultural Experiment Station, in cooperation with the Crops Research Division, ARS, USDA. Received Sept. 17, 1959.
3 The details of construction are similar to those of a machine in use at North Dakota State University and were kindly furnished to us by Robert Bothun, Agronomy Department, North Dakota State University, Fargo, North Dakota.

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