

In attempting to germinate their spores, several kinds of nutrient media were tried. None gave better results than a sterilized decoction of virgin prairie soil, maintained at a temperature of about 60° Fahrenheit, and this medium was used throughout.

The problem in hand has been attacked from several standpoints, an outline of which, with some results, is as follows :—

### I. TO DETERMINE THE EFFICIENCY OF VARIOUS SOLUTIONS IN KILLING SPORES IN UNBROKEN SMUT BALLS.

Upwards of one hundred tests were made with solutions of copper sulphate varying in strength from one pound in one gallon of water to one pound in twenty-five gallons, and for periods varying from one minute to twenty-four hours; and seventy-five tests with formalin for periods varying from one hour to four hours. In every case the smut balls were immersed in the solutions.

The following is an extract from the record of data obtained.

Strength of Solution.	Length of Treatment.	Per cent. of Smut Balls containing living spores after treatment.
<i>Copper Sulphate :</i>		
1 lb.—1 gal. ....	20 minutes.	60
1 lb.—2½ gal. ....	1 hour.	33.
1 lb.—5 gal. ....	1 hour.	80
1 lb.—10 gal. ....	1 hour.	100
1 lb.—20 gal. ....	12 hours.	33
<i>Formalin :</i>		
1 lb.—50 gal. ....	3½ hours.	100.
1 lb.—60 gal. ....	3½ hours.	100.
1 lb.—40 gal. ....	4 hours.	33.

In all of the formalin and a few of the copper sulphate tests, the spores were taken from directly under the covering of the smut ball, proving that the smut ball is very impervious to penetration by a liquid.

From the foregoing table it will be seen that the vitality of all the spores contained in smut balls cannot be destroyed by practicable methods of treatment. Since smut balls that are left in the seed wheat are apt to become broken when passing through the seeder, recontaminating treated seed, it is therefore always advisable to get rid of them before sowing. This may be done by immersing the seed in barrels or tanks, made for the purpose, to such a depth that all the smut balls may be floated, skimmed off, and destroyed.