

## Rule Change Proposal No. 11

### PURPOSE

To add a substratum method to the germination testing method for *Zea mays* subsp. *mays* (field corn, popcorn, sweet corn, and ornamental corn).

### PRESENT RULE

<u>Kind of Seed</u>	<u>Substrata</u>	<u>Temp. C°</u>	<u>First Count Days</u>	<u>Final Count Days</u>	<u>Additional Directions</u>
<i>Zea mays</i> subsp. <i>mays</i> field corn, popcorn, sweet corn, and ornamental corn	B, T, S, TC	20-30; 25	4	7	See footnotes a and b for ornamental varieties.

### PROPOSED RULE

<u>Kind of Seed</u>	<u>Substrata</u>	<u>Temp. C°</u>	<u>First Count Days</u>	<u>Final Count Days</u>	<u>Additional Directions</u>
<i>Zea mays</i> subsp. <i>mays</i> field corn, popcorn, sweet corn, and ornamental corn	B, T, S, TC, <u>TCS</u>	20-30; 25	4	7	See footnotes a and b for ornamental varieties. Sweet corn root develop- ment maybe be inhibited by excess moisture.

### SUPPORTING EVIDENCE

The proposed substrate method of TCS (top of creped cellulose paper without a blotter and covered with ½ to ¾ inch of sand) was compared to TC (top of creped cellulose paper) and S (sand) as an alternative method for corn.

The proposed TCS method has been in use at the Iowa State Seed Science Center and Mid-West Seed Services, Inc. (MWSS) for twenty-three and nine years, respectively. In practice this test is called a “Sand Test” by both laboratories, so we are documenting the “Sand Test” method. The test is conducted at MWSS by placing a sheet of creped cellulose paper on a tray and applying a standard amount of water, seeds are placed on the moistened paper and then dry sand (no moisture) is used to cover the seeds, the moisture migrates upward wetting the sand. This method is very reproducible since the moisture content of the sand is standardized. These studies were only conducted on field corn (yellow dent), however this method is also commonly used on sweet corn, popcorn and ornamental corn. We have found that sweet corn requires less moisture than field corn in the TC, S and TCS methods.

Testing was conducted at Iowa State Seed Testing Laboratory and Mid-West Seed Services, Inc. on four seed lots of field corn (yellow dent) utilizing germination temperatures of both 20-30°C and 25°C. Each laboratory tested eight replicates of 100 seeds for each seed lot and substrate method. Germination of the four seed lots varied between 85% and 96% (Table 1.) The two laboratories participating in this study produced identical mean germination averages of 92% (Table 2). Significant differences were found between substrate types with TC, TCS and S producing germinations of 94, 92 and 90%, respectively (Table 3). Germination temperatures produced the same mean germination percentage of 92% (Table 4).

**Table 1.** Mean germination of four seed lots averaged across two laboratories, three substrata methods and two temperatures.

Corn (N=384)	
<b>Lot</b>	<b>% Germ</b>
1	96 C
2	96 C
3	90 B
4	85 A
LSD(0.05)	0.7725

**Table 2.** Mean germination of two laboratories averaged across four seed lots, three substrata methods and two temperatures.

Corn (N=384)	
<b>Lab</b>	<b>% Germ</b>
Iowa State Seed Laboratory	92 B
Mid-west Seed Services, Inc	92 A
LSD(0.05)	0.5463

**Table 3.** Mean germination of three substrata methods averaged across four seed lots, two laboratories and two temperatures.

Corn (N=384)	
<b>Method</b>	<b>% Germ</b>
Top of creped cellulose paper without a blotter (TC)	94 C
Sand (S)	90 A
Top of creped cellulose paper without a blotter with sand (TCS)	92 B
LSD(0.05)	0.6690

**Table 4.** Mean germination of two temperatures averaged across two laboratories, three substrata methods and four seed lots.

Corn (N=384)	
<b>Temperature ° C</b>	<b>% Germ</b>
20-30	92 A
25	92 A
LSD(0.05)	0.5463

**SUBMITTED BY**

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**DATE OF PROPOSAL**

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