

# **Germination of Six Onion Seed Lots Using Paper Towels and Pleated Paper Substrata**

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# Rationale

- **Pleated paper is used in onion seed industry to conduct standard germination tests.**
- **It is thought that it may enhance germination compared to paper towel or blotter, therefore should be included in the AOSA Rules.**
- **This study was designed to verify this claim.**
- **If the results showed that using pleated paper help improving germination or give similar results to the paper towel/blotter, then it may be recommended to add pleated paper as an alternative media in the AOSA Rules for germinating onion.**

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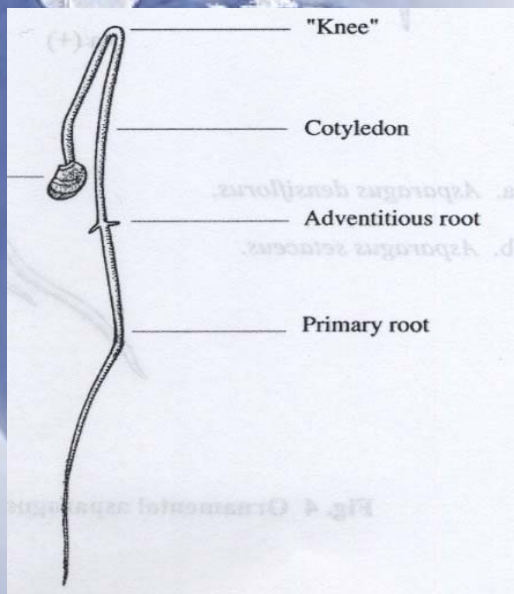
## Slide 2

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, 5/26/2009

# Objective

To compare germination of six onion seed lots using paper towel/blotter and pleated paper.



# Materials and Methods

- **A national Referee was conducted in 2008 to compare the germination test results using two substrate.**

## **Substrate**

- 1) **Choice of paper towels (T) or between blotters (B), according to the AOSA Rules, and**
- 2) **Pleated paper - “paper strips”, placed beneath the pleated paper (PP).**

## ➤ **Seed Lots**

**Six onion seed lots from the 2007 with different initial qualities (96-84% germination), two raw seed, two film coated seed and two pelleted seed were used.**

## ➤ **Participating Laboratories**

**Sixteen laboratories participated in the referee, out of which two labs submitted incomplete data.**

# Materials and Methods

- **Temperature:** 20C
- **Replicates:** 4 replications of 100 seeds each were used for each treatment.
- **Counts:**
  - first count after 6 days
  - final count after 10 days
- **Evaluation:** Normal seedlings with hypocotyle and radicle length of 0.5'' from knee or more were removed at the first count to minimize secondary fungal infection.

**Tolerance Table 13J (AOSA, 2008)** was used to determine the actual difference in final germination results between the two media.

## Results

- **The analysis of variance (ANOVA) showed no significant difference in the final germination results whether media paper towel/blotter or pleated paper was used.**
- **The ANOVA also indicated significant differences in germination results among seed lots and laboratories at  $P=0.05$ . (Table 1).**
- **Significant difference in the final germination results was detected among laboratories when they used the same substratum (Table 2; Figs 1-6).**
- **Variation in germination results can be attributed to two main sources: random sampling variation, and systematic variation among laboratories.**

## Results

**Table 1. Analysis of variance of six onion seeds lots germinated at fourteen laboratories using paper towel and pleated paper.**

<b>Source</b>	<b>df</b>	<b>SS</b>	<b>MS</b>	<b>F value</b>	<b>P</b>
<b>Rep</b>	<b>3</b>	<b>55.7</b>	<b>18.57</b>	<b>1.58</b>	<b>ns</b>
<b>Med</b>	<b>1</b>	<b>2.88</b>	<b>2.88</b>	<b>0.25</b>	<b>ns</b>
<b>Lots</b>	<b>5</b>	<b>15277.35</b>	<b>3055.6</b>	<b>260.8</b>	<b>***</b>
<b>Labs</b>	<b>13</b>	<b>2791.69</b>	<b>214.75</b>	<b>18.33</b>	<b>***</b>



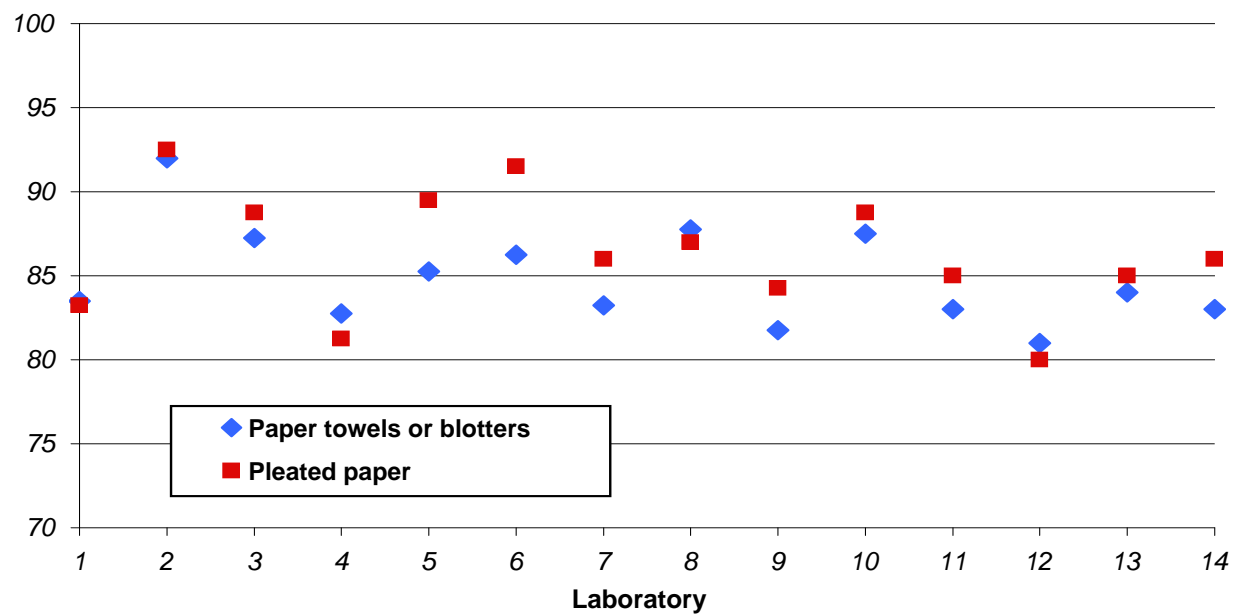
# Results

**Table 2. Mean Germination percentage of six onion seed lots germinated on blotters/paper towels and pleated paper tested in 14 laboratories.**

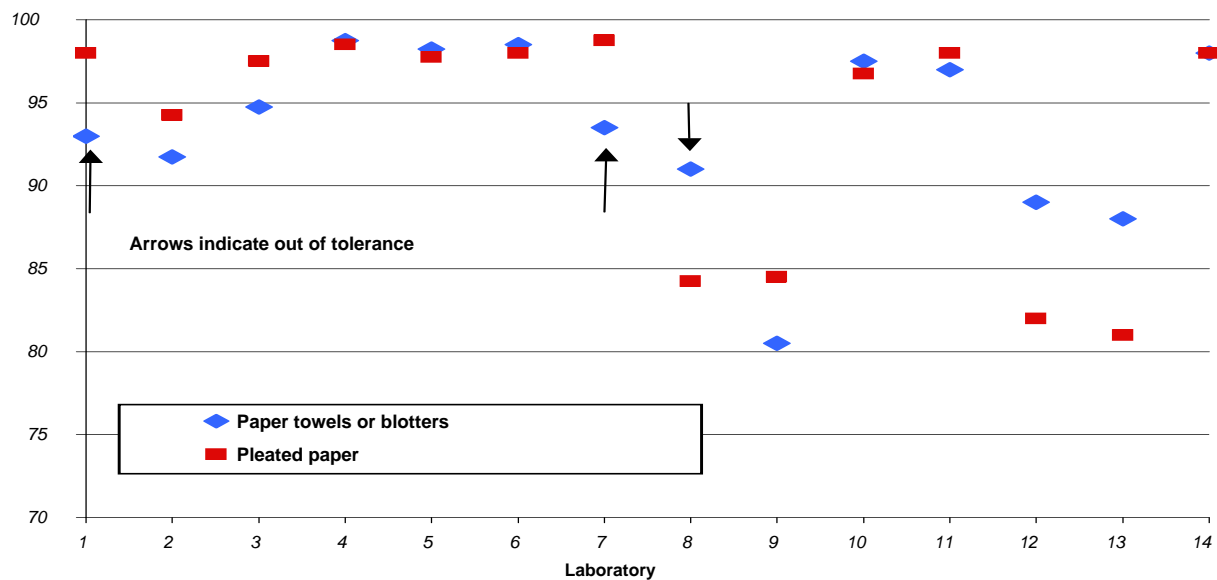
Seed Lots	Germination %	
	Blotters/towels	Pleated paper
1	85	86
2	94	93
3	96	96
4	84	85
5	85	84
6	90	92

# Results

## Lot 1

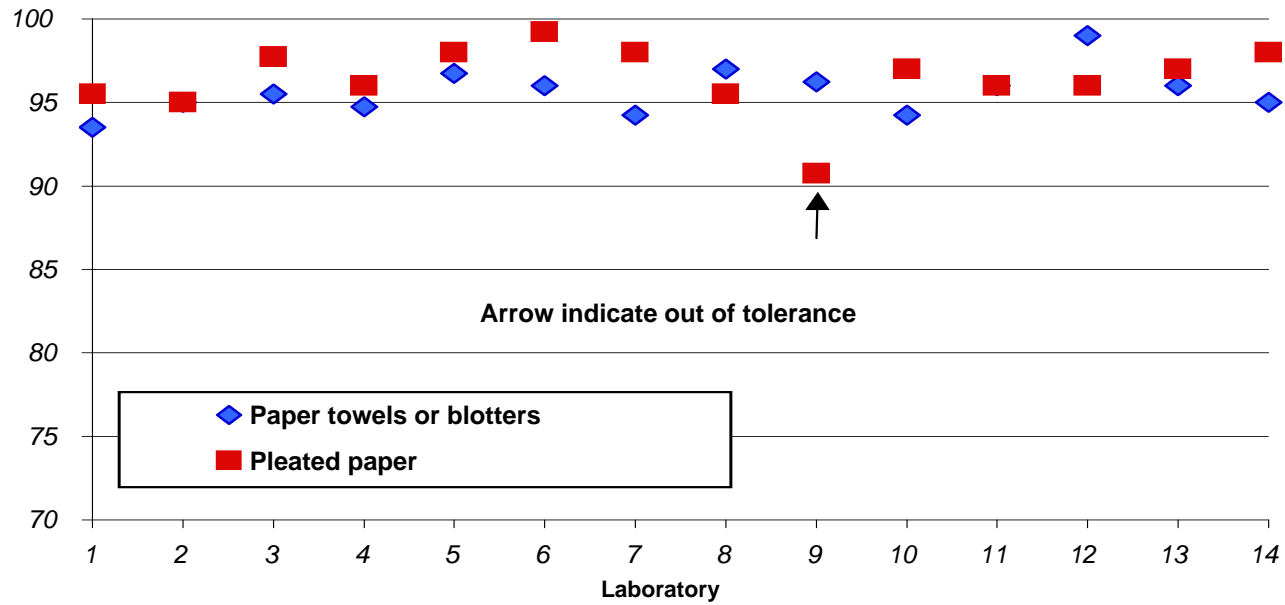


## Lot 2



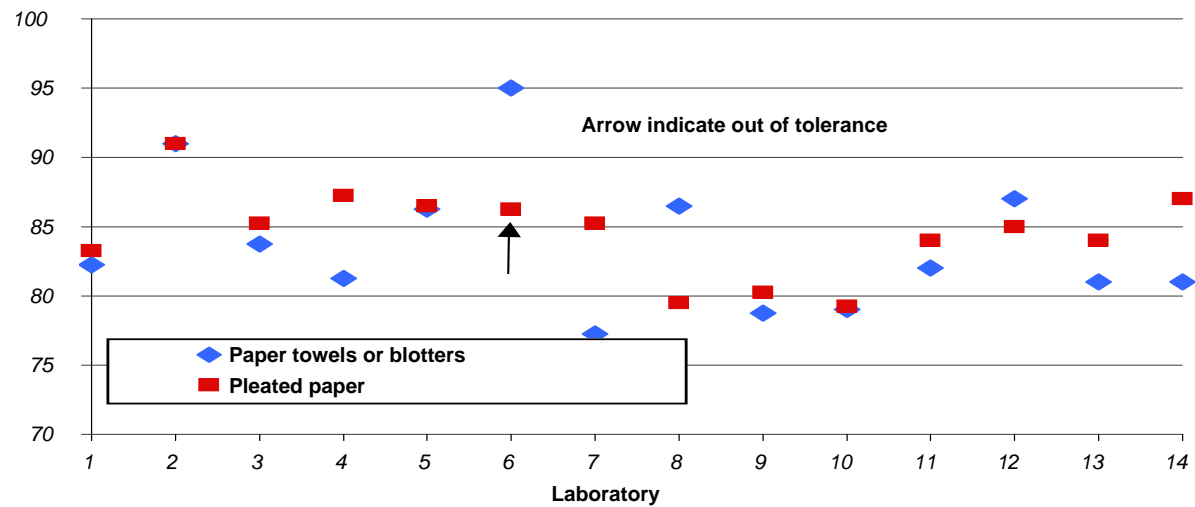
# Results

## Lot 3



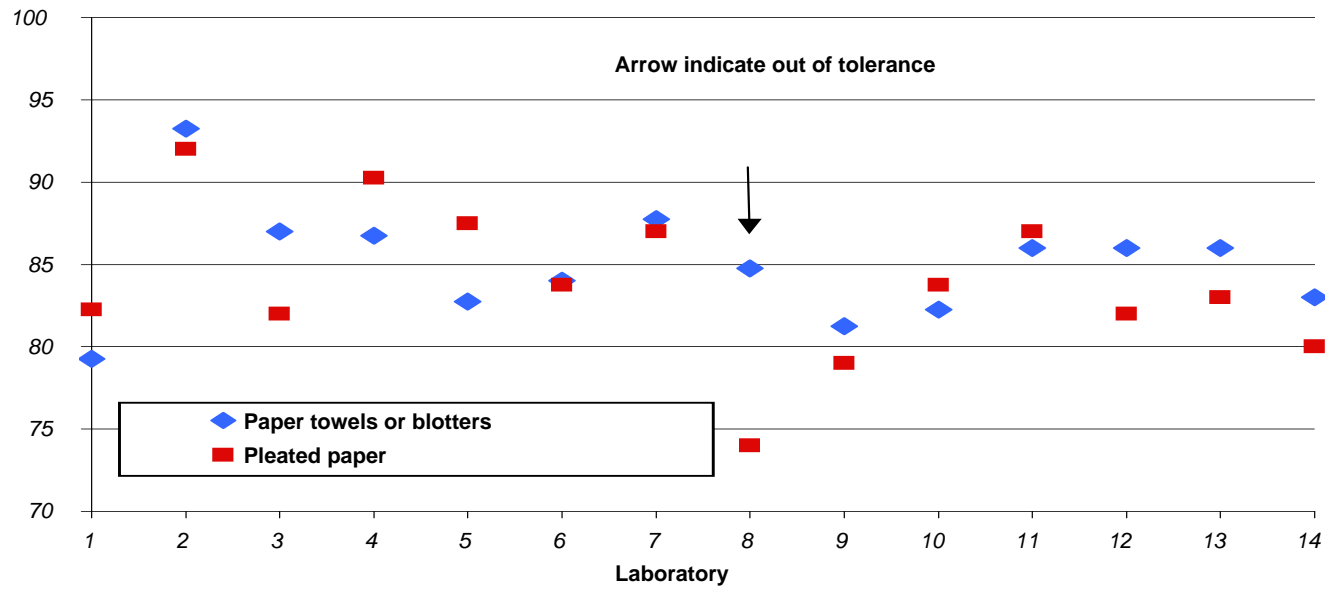
Arrows indicate out of tolerance

## Lot 4

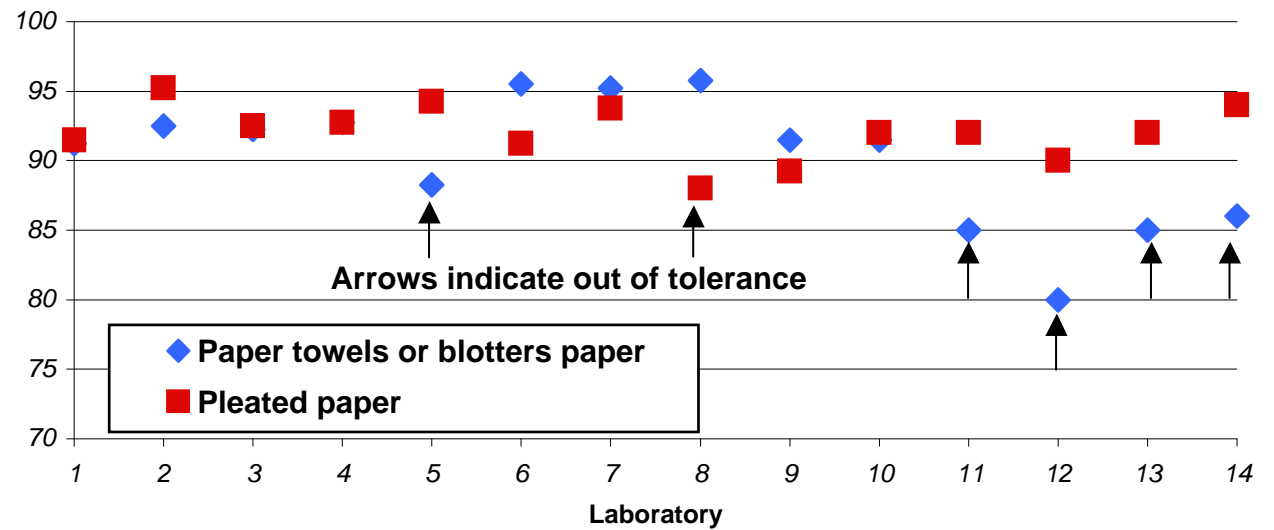


# Results

## Lot 5



## Lot 6



## Results

- **The results did not show a superior pattern for using the towel paper over the pleated paper or vice versa.**
- **This suggests that either the towel paper/blotters or the pleated paper can be used alternatively without expecting significant difference in germination results of onion seed.**
- **The preference of using one medium over the other will depend on the availability of media, convenience, and economy.**
- **The difference in germination results detected among laboratories was greater than those due to difference in the media regardless of the quality of onion seeds used.**

## Conclusions

- **Paper towels and blotters perform similar to pleated paper when used as media in the standard germination tests of onion seeds regardless of the quality of the seeds.**
- **The results suggest that adding pleated paper to the current media in the AOSA Rules is an option that will not affect the germination test results.**