

**AOSA/SCST Region 2**  
**Virtual Soybean Seedling**  
**Evaluation Referee**  
**2008-2009**



# Background

- The referee was available on the AOSA and SCST web pages.
- Participants were asked to classify 21 virtual soybean seedlings as normal or abnormal.
- Space was given to explain answers and/or comment on the images.
- Participants were asked to complete a brief survey at the end of the referee.



# Participant Information

- 77 participants\*
- Substrates typically used:  
TC: 16, Towels: 60, TCS: 1

Experience:

Less than one year : 9

1-5 years: 17

More than five years: 39

\* 12 participants did not indicate experience.



# SCST Organizations Represented

- Seminis                    Michigan Crop Improvement
- Illinois Foundation Seed
- Ag Reliant                Eurofins (STA Labs)
- South Valley Seed Testing
- SGS (Mid-West Seed Services)
- Illinois Crop Improvement
- Garrison & Townsend
- Syngenta
- Pioneer Hi-Bred International

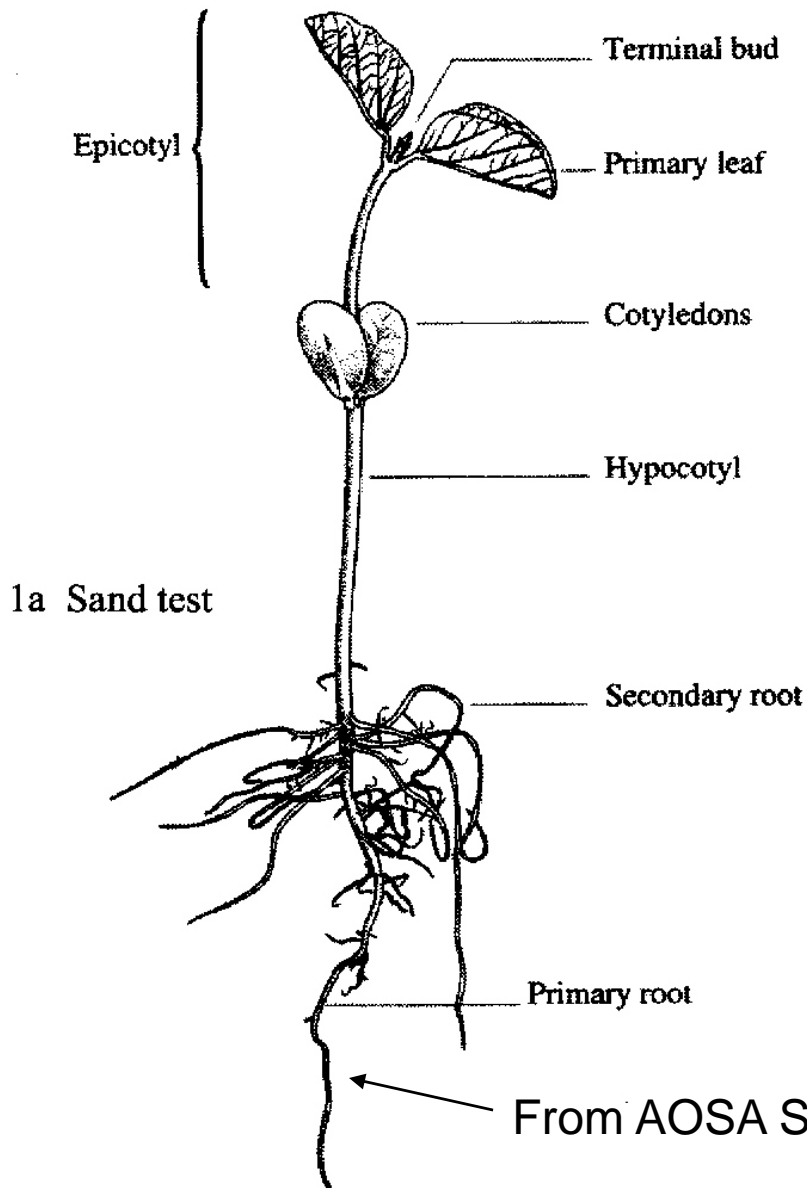


# AOSA Labs Represented

- Arizona
  - Virginia
  - USDA
- Florida  
Georgia  
Iowa
- Mississippi  
South Carolina  
North Carolina



# Normal Seedling



Roots: vigorous primary or two or more secondary roots.

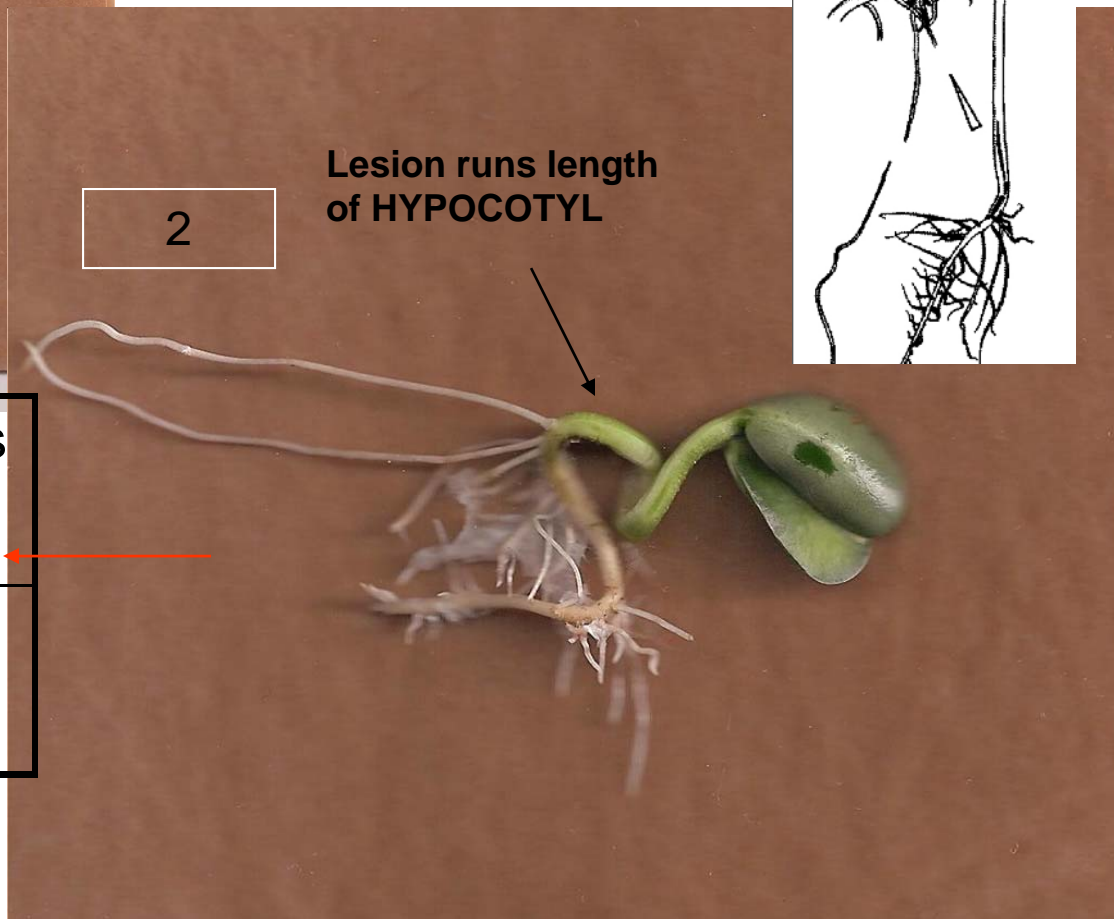
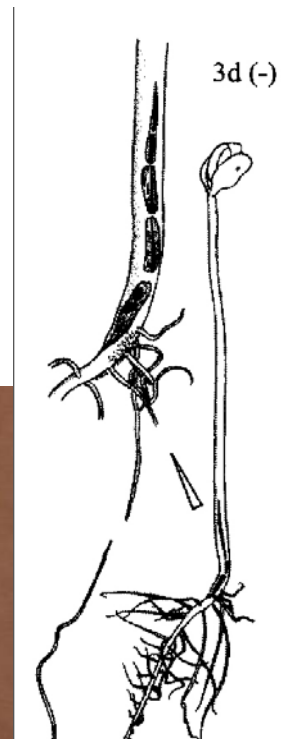
Hypocotyl: not markedly shortened or thickened

Cotyledons: one intact or two halves (50%)

Epicotyl: at least one primary leaf; terminal bud present.



|        |         |        |
|--------|---------|--------|
| Total  | CCP     | Towels |
| 99%    | 94      | 100    |
| < 1 yr | 1-5 yrs | >5 yrs |
| 89     | 100     | > 100  |



Lesion runs length of HYPOCOTYL

|        |         |        |
|--------|---------|--------|
| Total  | CCP     | Towels |
| 49%    | 7%      | 60%    |
| < 1 yr | 1-5 yrs | >5 yrs |
| 44%    | 41%     | 64%    |



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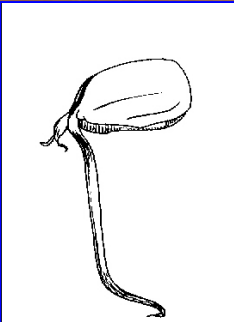
Ignore minor damage

Decay only on this cotyledon



|       |         |         |
|-------|---------|---------|
| Total | CCP     | Towels  |
| 55%   | 63%     | 52%     |
| <1 yr | 1-5 yrs | > 5 yrs |
| 44%   | 53%     | 44%     |

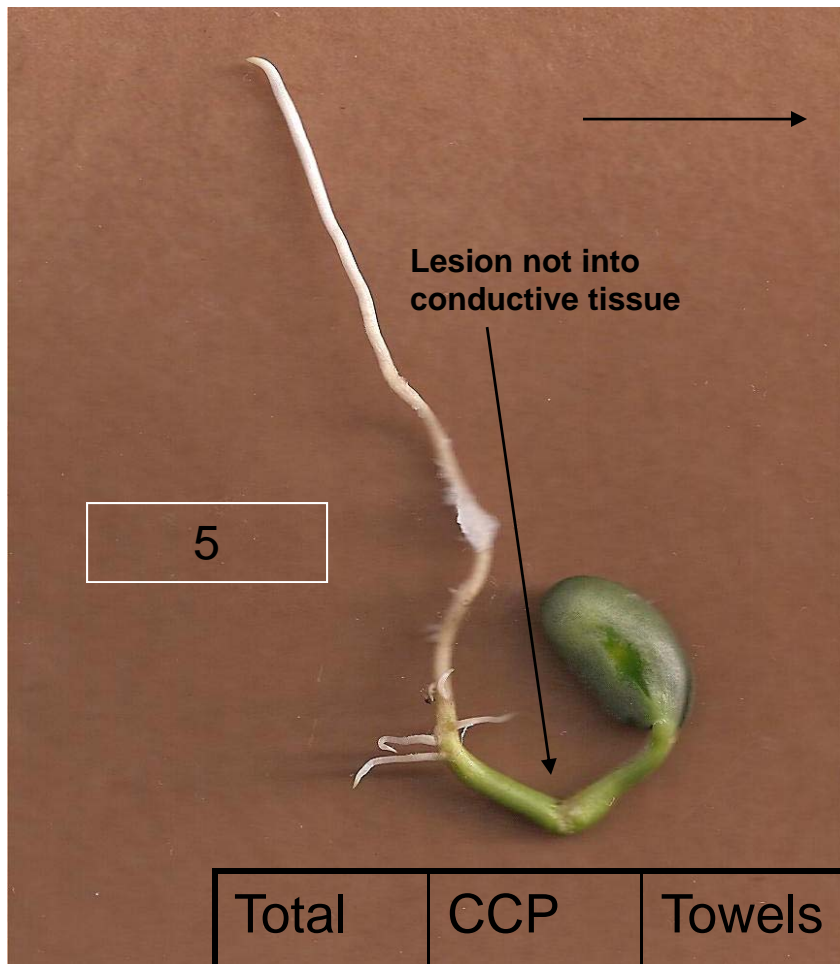
4



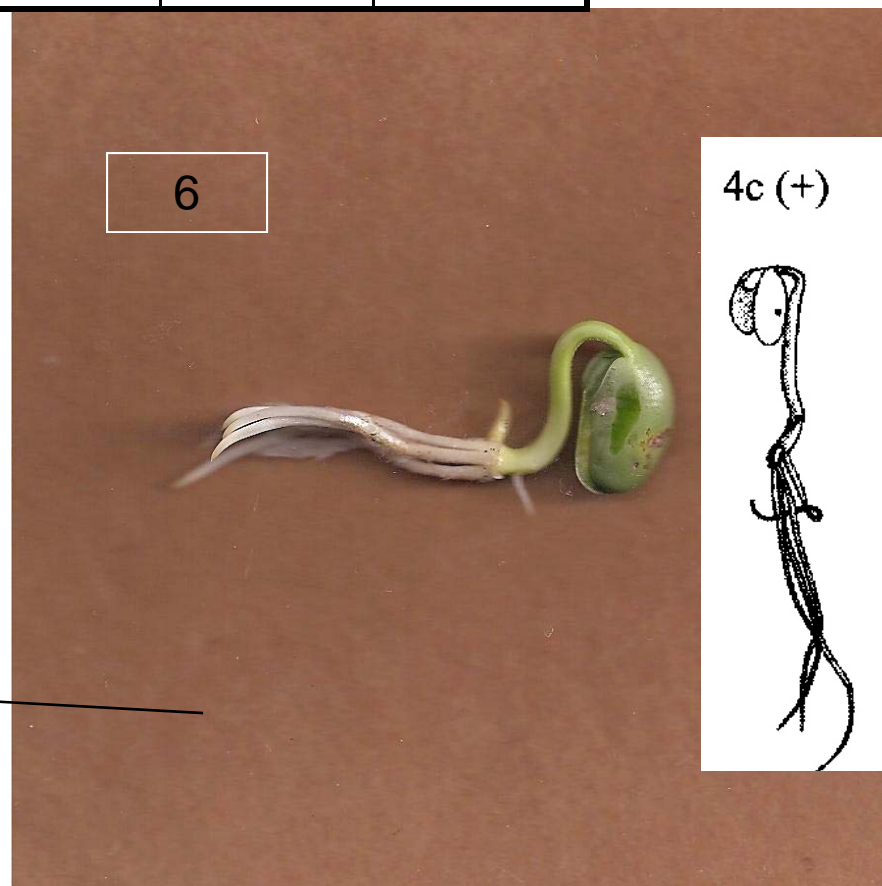
|       |         |        |
|-------|---------|--------|
| Total | CCP     | Towels |
| 14%   | 0%      | 19%    |
| <1 yr | 1-5 yrs | >5 yrs |
| 11%   | 18%     | 10%    |



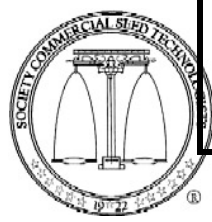




|       |         |        |
|-------|---------|--------|
| Total | CCP     | Towels |
| 100%  | 100%    | 100%   |
| <1 yr | 1-5 yrs | >5 yrs |
| 100%  | 100%    | 100%   |



|       |         |        |
|-------|---------|--------|
| Total | CCP     | Towels |
| 84%   | 88%     | 83%    |
| <1 yr | 1-5 yrs | >5 yrs |
| 67%   | 82%     | 87%    |



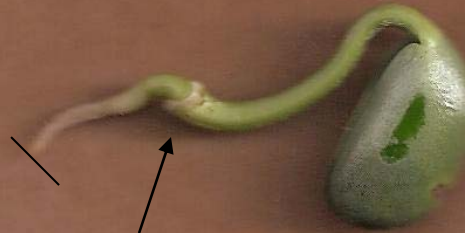
7



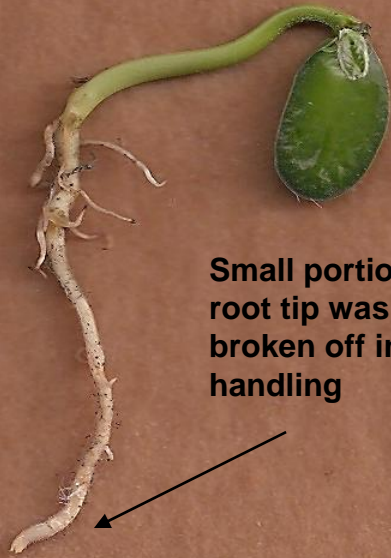
|       |         |        |
|-------|---------|--------|
| Total | CCP     | Towels |
| 25%   | 19%     | 27%    |
| <1 yr | 1-5 yrs | >5 yrs |
| 33%   | 29%     | 23%    |

|       |         |        |
|-------|---------|--------|
| Total | CCP     | Towels |
| 7%    | 0%      | 8%     |
| <1 yr | 1-5 yrs | >5 yrs |
| 78%   | 6%      | 5%     |

8



9



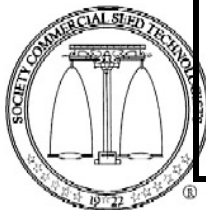
Small portion of root tip was broken off in handling

|       |         |        |
|-------|---------|--------|
| Total | CCP     | Towels |
| 82%   | 81%     | 82%    |
| <1 yr | 1-5 yrs | >5 yrs |
| 89%   | 71%     | 80%    |

10



|       |         |         |
|-------|---------|---------|
| Total | CCP     | Towels  |
| 7%    | 13%     | 5%      |
| <1 yr | 1-5 yrs | > 5 yrs |
| 78%   | 6%      | 10%     |



11



|       |         |        |
|-------|---------|--------|
| Total | CCP     | Towels |
| 83%   | 81%     | 83%    |
| <1 yr | 1-5 yrs | >5 yrs |
| 78%   | 77%     | 69%    |

12



|       |         |         |
|-------|---------|---------|
| Total | CCP     | Towels  |
| 57%   | 44%     | 60%     |
| <1 yr | 1-5 yrs | > 5 yrs |
| 33%   | 41%     | 62%     |



13



|       |         |        |
|-------|---------|--------|
| Total | CCP     | Towels |
| 60%   | 50%     | 62%    |
| <1 yr | 1-5 yrs | >5 yrs |
| 67%   | 53%     | 31%    |



14



|       |         |        |
|-------|---------|--------|
| Total | CCP     | Towels |
| 52%   | 69%     | 48%    |
| <1 yr | 1-5 yrs | >5 yrs |
| 44%   | 41%     | 62%    |

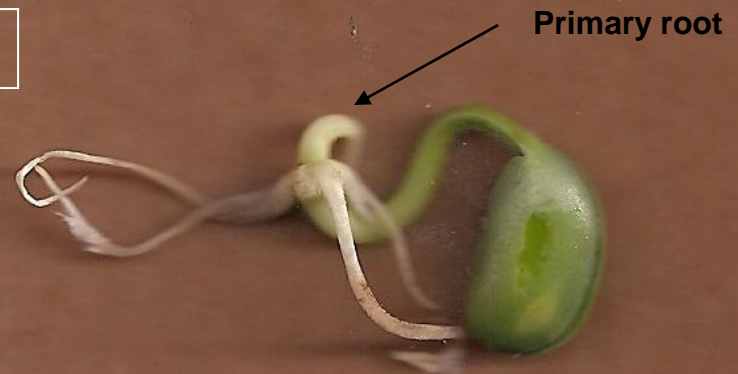


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|       |         |        |
|-------|---------|--------|
| Total | CCP     | Towels |
| 35%   | 50%     | 30%    |
| <1 yr | 1-5 yrs | >5 yrs |
| 11%   | 18%     | 41%    |

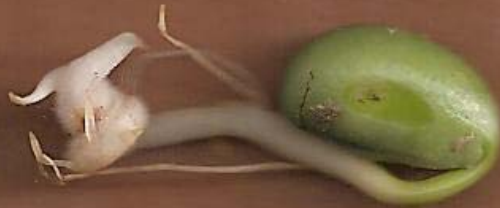
16



|       |         |        |
|-------|---------|--------|
| Total | CCP     | Towels |
| 73%   | 75%     | 72%    |
| <1 yr | 1-5 yrs | >5 yrs |
| 56%   | 76%     | 74%    |

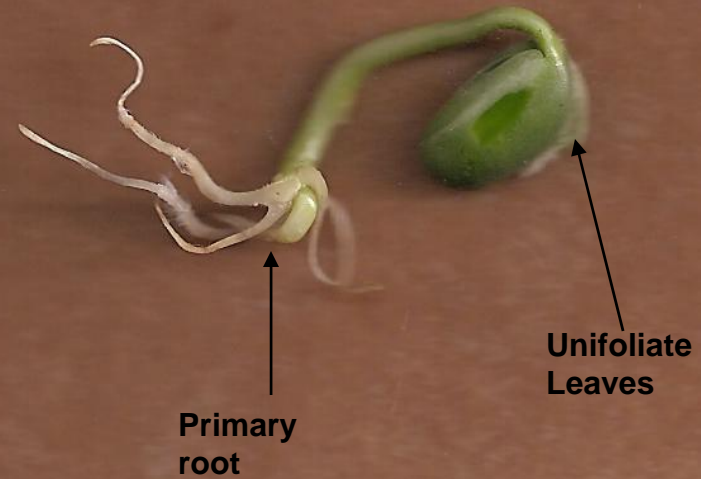


17



|       |         |        |
|-------|---------|--------|
| Total | CCP     | Towels |
| 14%   | 6%      | 18%    |
| <1 yr | 1-5 yrs | >5 yrs |
| 11%   | 18%     | 13%    |

18



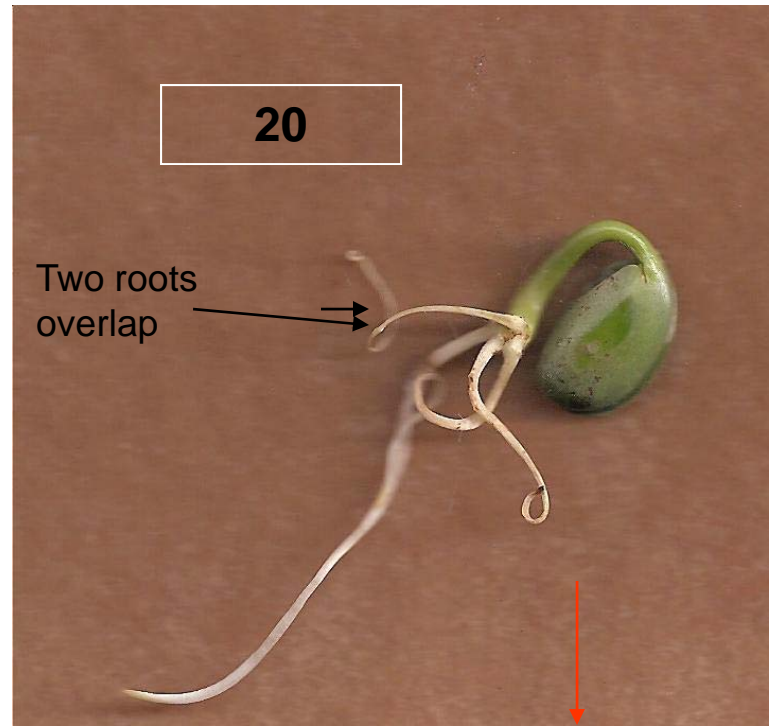
|       |         |        |
|-------|---------|--------|
| Total | CCP     | Towels |
| 77%   | 75%     | 77%    |
| <1 yr | 1-5 yrs | >5 yrs |
| 67%   | 71%     | 77%    |





19

|       |         |        |
|-------|---------|--------|
| Total | CCP     | Towels |
| 3%    | 0%      | 3%     |
| <1 yr | 1-5 yrs | >5 yrs |
| 11%   | 0%      | 3%     |



20

Two roots overlap

|       |         |        |
|-------|---------|--------|
| Total | CCP     | Towels |
| 79%   | 63%     | 83%    |
| <1 yr | 1-5 yrs | >5 yrs |
| 67%   | 82%     | 77%    |





|       |         |        |
|-------|---------|--------|
| Total | CCP     | Towels |
| 3%    | 0%      | 3%     |
| <1 yr | 1-5 yrs | >5 yrs |
| 11%   | 0%      | 3%     |



# Findings

- 5 out of the 21 seedlings (24%) were close to being a toss up (50/50) for the overall group.
- 14 of 20 seedlings had higher percentages of normal seedlings for those using towels than TC (VersaPak™).
- Four seedlings that had 0% normal ratings for TC users, had ratings of 3%, 8% or 19% for towels.
- The three groupings of experience level pretty much evenly split having classified the most of the 21 seedlings as normal.
- Most of the seedlings had root problems and this is likely the area that most needs to be looked at in future referees and in adding to drawings in the Seedling Evaluation HB.



# **THANKS** to all those of participated in this referee.

Please contact Mike Stahr with questions and comments about this year's referee.

Also please give suggestions for future virtual referees and for changes to the AOSA Seedling Evaluation Handbook

[mgstahr@iastate.edu](mailto:mgstahr@iastate.edu), 515-294-6826

