RB Rule Proposal #7

**Purpose of the Rule:** The purpose of this rule proposal is to remove raised blotters (RB) as a media option from the AOSA Rules for Testing Seeds*.*

**Present Rule:**

Section 6.9.a

**Substrata.** — Any medium listed for a particular species in the substrata column of Table 6A may be used. The order listed does not indicate preference. Symbols for substrata in column 2, Table 6A are:

**A:** top of agar, polysaccharide powder solidifier made from red algae (without any additional nutrients, vitamins or hormones). Agar powder should be approximately 99% pure. Agar media must be free of extra salts that may inhibit plant growth.

**B**: between blotters

**C**: creped cellulose paper wadding (0.3-inch thick Kimpak or equivalent) covered with a single thickness of blotter through which holes are punched for the seed that are pressed for about one-half their thickness into the paper wadding

**O:** organic growing media

**OT:** organic growing media covering seed planted on top of paper toweling (T)

**P**: covered petri dishes or other rigid transparent containers, with appropriate layers of blotters, filter paper, paper toweling, creped cellulose paper, pleated paper or sand that provide adequate moisture to the seeds during the test period

**PP**: pleated filter paper (see footnote a in Table 6A)

**PT**: substrata listed for P with the following substrata also allowed: sponge rok, vermiculite, terralite, or a mixture of 50 percent sand and vermiculite, sand and perlite, etc.

**RB:** blotters and raised covers, prepared by folding up the edges of the blotter to form a good support for the upper fold which serves as a cover, preventing the top from making direct contact with the seeds

**S:** sand

**T:** paper toweling, used either as folded towel tests or as rolled towel tests in horizontal or vertical position

**TB:** top of blotters

**TS:** top of sand

**TC:** on top of creped cellulose paper without a blotter

**TCS:** on top of creped cellulose paper without a blotter and covered with ½ to ¾ inch layer of sand.

Table 6A

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Kind of Seed** | **Substratea** | **Temperature (C°)** | **First Count (days)** | **Final Count (days)** | **Specific requirements** | **Fresh and Dormant** |
|  |  |  |  |  |  |  |
| *Capsicum chinense Jacq.*  habanero pepper | T, B, TB,  RB, P | 20-30 | 10 | 21 |  | Light and  GA3(500ppm) |
| *Solanum lycopersicum var. lycopersicum*  tomato | T, B, P,  RB, A | 20-30 | 5 | 14 |  | Light; KNO3 |
| *Capsicum spp.*  vegetable and ornamental pepper | T, B, TB,  RB, P | 20-30 | 10 | 14 |  | Light and KNO3.  See footnotes b and  c for ornamental  varieties |
| *Solanum melongena*  eggplant | P, TB,  RB, T | 20-30 | 7 | 14 |  | Light; KNO3 |

**Proposed Rule:**

Section 6.9.a

**Substrata.** — Any medium listed for a particular species in the substrata column of Table 6A may be used. The order listed does not indicate preference. Symbols for substrata in column 2, Table 6A are:

**A:** top of agar, polysaccharide powder solidifier made from red algae (without any additional nutrients, vitamins or hormones). Agar powder should be approximately 99% pure. Agar media must be free of extra salts that may inhibit plant growth.

**B**: between blotters

**C**: creped cellulose paper wadding (0.3-inch thick Kimpak or equivalent) covered with a single thickness of blotter through which holes are punched for the seed that are pressed for about one-half their thickness into the paper wadding

**O:** organic growing media

**OT:** organic growing media covering seed planted on top of paper toweling (T)

**P**: covered petri dishes or other rigid transparent containers, with appropriate layers of blotters, filter paper, paper toweling, creped cellulose paper, pleated paper or sand that provide adequate moisture to the seeds during the test period

**PP**: pleated filter paper (see footnote a in Table 6A)

**PT**: substrata listed for P with the following substrata also allowed: sponge rok, vermiculite, terralite, or a mixture of 50 percent sand and vermiculite, sand and perlite, etc.

**~~RB:~~** ~~blotters and raised covers, prepared by folding up the edges of the blotter to form a good support for the upper fold which serves as a cover, preventing the top from making direct contact with the seeds~~

**S:** sand

**T:** paper toweling, used either as folded towel tests or as rolled towel tests in horizontal or vertical position

**TB:** top of blotters

**TS:** top of sand

**TC:** on top of creped cellulose paper without a blotter

**TCS:** on top of creped cellulose paper without a blotter and covered with ½ to ¾ inch layer of sand.

Table 6A

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Kind of Seed** | **Substratea** | **Temperature (C°)** | **First Count (days)** | **Final Count (days)** | **Specific requirements** | **Fresh and Dormant** |
| *Capsicum chinense Jacq.*  habanero pepper | T, B, TB,  ~~RB~~, P | 20-30 | 10 | 21 |  | Light and  GA3(500ppm) |
| *Capsicum spp.*  vegetable and ornamental pepper | T, B, TB,  ~~RB~~, P | 20-30 | 10 | 14 |  | Light and KNO3.  See footnotes b and  c for ornamental  varieties |
| *Solanum lycopersicum var. lycopersicum*  tomato | T, B, P,  ~~RB~~, A | 20-30 | 5 | 14 |  | Light; KNO3 |
| *Solanum melongena*  eggplant | P, TB,  ~~RB~~, T | 20-30 | 7 | 14 |  | Light; KNO3 |

**Harmonization and Impact Statement:** This rule proposal would not affect harmonization with ISTA as raised blotter is not a media option for eggplant, peppers, or tomato.

This proposal would not harmonize with FSA or Canada M&P because raised blotter is a recognized media option in both sets of germination methods.

**Supporting Evidence:** In April of 2021, the germination working group submitted a survey to the AOSA and SCST membership for 33 crop species that have either multiple temperatures and/or multiple media options. The survey listed all the current temperature and substrate options that are currently listed in Table 6A along with the option to list “other” if the laboratory uses a temperature and/or substrate that is not listed in the AOSA Rules. The goal of this survey was to clean up Table 6A and increase uniformity among laboratories by removing any media or temperature options that are not being used by any laboratories.

There are approximately 100 AOSA and SCST labs. The survey had a respondent rate of 68 individuals.

Of the 68 respondents, 32 laboratories test eggplant with 95% testing less than 250 samples per year.

The media options listed in Table 6A for pepper are covered petri dish (P), top of blotter (TB), raised blotter (RB), and paper towelling (T). 35% of laboratories use covered petri dish (P), 26% use top of blotter (TB), 0% use raised blotter (RB), and 48% use paper towelling (T). One laboratory uses top of creped cellulose with sand, which is not an approved method. These numbers add up to over 100% because some labs reported the use of multiple methods.

Of the 68 respondents, 36 laboratories test tomato with 84% testing 11 samples or more per year.

The media options listed in Table 6A for tomato are paper towelling (T), between blotters (B), covered petri dish (P), raised blotter (RB), and agar (A). 73% of labs use paper towelling (T), 5% use between blotters (B), 30% use covered petri dish (P), 0% use raised blotter (RB), and 0% use agar (A). One laboratory uses top of creped cellulose with sand and two laboratories use top of blotter, neither of which are approved methods. These numbers add up to over 100% because some labs reported the use of multiple methods.

Of the 68 respondents, 25 laboratories test habanero pepper with 62% testing 11 samples or more per year.

The media options listed in Table 6A for habanero pepper are paper towelling (T), between blotters (B), top of blotter (TB), raised blotter (RB), and covered petri dish (P). 58% of laboratories use paper towelling (T), 12% use between blotters (B), 23% use top of blotter (TB), 0% use raised blotter (RB), and 15% use covered petri dish (P). These numbers add up to over 100% because some labs reported the use of multiple methods.

Of the 68 respondents, 36 laboratories test pepper with 84% testing 11 samples or more per year.

The media options listed in Table 6A for pepper are paper towelling (T), between blotters (B), top of blotter (TB), raised blotter (RB), and covered petri dish (P). 73% of labs use paper towelling (T), 18% use between blotters (B), 16% use top of blotter (TB), 0% use raised blotter (RB), and 14% use covered petri dish (P). One laboratory uses top of creped cellulose with sand which is not an approved method. These numbers add up to over 100% because some of the labs reported the use of multiple methods.

In the 1937 AOSA Annual meeting proceedings it was discussed that raised blotters were recommended for small seeded species, those with a mucilaginous coat, or those that would not otherwise receive sufficient aeration. Almost twenty years prior to 1954, raised blotters were listed under remarks for eggplant, peppers, and tomatoes as an alternative method. In 1954, the raised blotters were moved into an approved media option for these four species. There is no documentation or scientific evidence that can be found as to why this decision was made. Raised blotters were also recommended for laboratories that used water jacket chambers to ensure adequate moisture be maintained. With the advances in technologies, very few labs, if any, still use the water jacketed germination chambers.

Raised blotter is a more time-consuming process for planting eggplant, pepper, and tomatoes. The average time for planting eggplant with raised blotters is 4.39 minutes versus 3.70 minutes for planting with towel or top of blotter (Table 1). The average time for planting peppers with raised blotters is 4.66 minutes versus 3.75 minutes for planting with towel or top of blotter (Table 2). The average time for planting tomato with raised blotters is 4.41 minutes versus 3.69 minutes for planting with towel or top of blotter (Table 3). These numbers may not seem like a significant time difference for one sample. However, if a lab were to be planting hundreds of samples, the time difference would be significant.

**Table 1. Time comparison of ten individuals** **(with varying experience levels) planting eggplant with raised blotter versus top of blotter or towel.**

|  |  |  |
| --- | --- | --- |
| **Person** | **RB** | **T/TB** |
| 1 | 3.62 | 2.85 |
| 2 | 4.48 | 3.73 |
| 3 | 3.97 | 3.28 |
| 4 | 3.65 | 3.14 |
| 5 | 4.87 | 4.02 |
| 6 | 4.68 | 4.20 |
| 7 | 5.13 | 4.38 |
| 8 | 5.00 | 4.29 |
| 9 | 4.46 | 4.13 |
| 10 | 4.01 | 2.97 |
| Average | 4.39 | 3.70 |

**Table 2. Time comparison of ten individuals (with varying experience levels) planting pepper with raised blotter versus top of blotter or towel.**

|  |  |  |
| --- | --- | --- |
| **Person** | **RB** | **T/TB** |
| 1 | 3.87 | 3.12 |
| 2 | 4.72 | 3.97 |
| 3 | 4.13 | 3.38 |
| 4 | 4.90 | 3.73 |
| 5 | 5.13 | 4.38 |
| 6 | 4.55 | 3.82 |
| 7 | 5.24 | 3.73 |
| 8 | 5.67 | 4.69 |
| 9 | 4.28 | 3.46 |
| 10 | 4.13 | 3.21 |
| Average | 4.66 | 3.75 |

**Table 3. Time comparison of ten individuals (with varying experience levels) planting tomato with raised blotter versus top of blotter or towel.**

|  |  |  |
| --- | --- | --- |
| **Person** | **RB** | **T/TB** |
| 1 | 3.62 | 2.90 |
| 2 | 4.57 | 3.82 |
| 3 | 4.38 | 3.41 |
| 4 | 3.43 | 2.97 |
| 5 | 4.40 | 3.75 |
| 6 | 4.50 | 3.80 |
| 7 | 5.00 | 4.47 |
| 8 | 5.38 | 4.70 |
| 9 | 4.57 | 3.85 |
| 10 | 4.25 | 3.20 |
| Average | 4.41 | 3.69 |

**Respectfully submitted**: Germination Uniformity Working Group: Sue Alvarez, Riad Baalbaki, Matthew Conway, Laura Donaldson, David Johnston, Sari Kopinksy, Kathy Mathiason, Raymond Shillito, Marija Topic, Bridget Westfall, and Heidi Jo Larson

**Date Submitted**: August 18, 2022