

AOSA RULES COMMITTEE  
Stephen J. Hurst, Chairman

All thirty-two rule proposals were adopted by the AOSA membership at the 1987 annual business meeting in Sacramento, California. Original proposals with supporting evidence for changes in, or additions to, the Rules appear in the AOSA Newsletter 61(1):37-72. Several of these proposals have been amended or slightly modified. Please note that all the adopted proposals that follow become official rules on October 1, 1987.

1. Addition to Table 1 of weights for working samples for 35 kinds of trees and shrubs listed only in Table 5, and revision of footnote a:

ADOPTED PROPOSAL

- 1) Include in Table 1 (Weights for working samples, TREE and SHRUB SEEDS) the following:

Kind of seed	Minimum weight for purity analysis <sup>a</sup>	Approximate number of seeds per gram	Approximate number of seeds per ounce
	Grams	Number	Number
<u>Aesculus pavia</u> L. red buckeye	4,500	--	3
<u>Carya illinoensis</u> (Wangenheim) K. Koch pecan	2,300	--	6
<u>Carya ovata</u> (Miller) K. Koch shagbark hickory	2,300	--	6
<u>Casuarina</u> spp. beefwood	3	1,030	29,300
<u>Cornus florida</u> L. flowering dogwood	300	10	280
<u>Cornus stolonifera</u> Michaux red-osier dogwood	75	40	1,150
<u>Crataegus mollis</u> Scheele downy hawthorn	110	24	653
<u>Eucalyptus deglupta</u> Blume Mindanao gum	½	10,000	280,000
<u>Eucalyptus grandis</u> Maiden rose gum	5	715	20,000
<u>Grevillea robusta</u> R. Brown silk-oak	40	66	1,875
<u>Libocedrus decurrens</u> Torrey incense-cedar	75	32	900
<u>Liriodendron tulipifera</u> L. yellow-poplar	80	31	875

<u>Magnolia grandiflora</u> L. southern magnolia	200	14	400
<u>Nyssa aquatica</u> L. water tupelo	500	1	30
<u>Pinus canariensis</u> C. Smith canary pine	275	9	260
<u>P. caribaea</u> Morelet caribbean pine	40	67	1,900
<u>P. clausa</u> (Chapman) Vasey sand pine	15	165	4,700
<u>P. glabra</u> Walters spruce pine	25	102	2,900
<u>P. kesiya</u> Gordon (Syn <u>P. khasya</u> ) khasia pine	50	51	1,440
<u>P. luchuensis</u> Mayr Formosa pine	30	80	2,260
<u>P. merkusii</u> Junghuhn & DeVriese merkus pine	65	39	1,100
<u>P. muricata</u> D. Don bishop pine	25	102	2,900
<u>P. patula</u> Schiede & Deppe Jelescote pine	20	116	3,300
<u>P. pinaster</u> Aiton cluster pine	110	22	625
<u>P. pinea</u> L. Italian stone pine	500	1	40
<u>P. radiata</u> D. Don monterey pine	80	30	830
<u>P. serotina</u> Michaux pond pine	20	120	3,400
<u>Platanus occidentalis</u> L. American sycamore	6	425	12,000
<u>Populus</u> spp. poplar	½	1,000 - 6,000	30,000 - 180,000
<u>Quercus</u> spp. red or black oak group	700	--	20
<u>Q. alba</u> L. white oak	1,750	--	8

<u>Q. muehlenbergii</u> Engelman chinkapin oak	560	--	25
<u>Q. virginiana</u> Miller live oak	630	--	22
<u>Rhododendron</u> spp. rhododendron	$\frac{1}{2}$	11,000	312,500
<u>Vitis vulpina</u> L. riverbank grape	80	32	900

2) Revise footnote a after Table 1 to read:

If it is necessary to conduct a noxious-weed seed examination, see section 2.3 to determine size of the working sample. For those kinds listed that show over 500 grams as the minimum weight for purity analysis, the actual amount given shall also be considered the minimum quantity to be examined for noxious-weed seeds. In no other cases does the amount examined for noxious-weed seeds need to exceed 500 grams.

2. Standardization of format for listing the scientific names and authorities for trees and shrubs in Table 5:

ADOPTED PROPOSAL

Delete the authority if present from the scientific names in Table 5.

3. Definition of prechill in 4.2f and the transfer of instructions for prechill from 4.2f to 4.9ℓ:

ADOPTED PROPOSAL

Adopted proposal as amended from original (4.9ℓ revised and some wording changed)--

- 1) 4.2f. Prechill.--A cold, moist treatment applied to seeds to overcome dormancy prior to the germination test. The prechill method varies among species, but is usually performed by holding imbibed seeds at a low temperature for a specified period of time. Refer to 4.9ℓ.
- 2) 4.9ℓ. Prechill.--
  - (1) Procedures for agricultural, vegetable, herb and flower seed prechill: Place seed on or in moist substratum at the indicated low temperature for the specified period of time. Refer to Tables 3 and 4.
  - (2) Procedures for tree and shrub seed prechill:
    - a. Place seed on the substratum in a closed dish; or
    - b. Place seed in a loosely woven bag or screen and insert in a moisture holding medium such as peat, sand, or vermiculite; or
    - c. Soak seed for 24 hours in tap water at room temperature (18-22°C), drain excess water and place in a suitable capped glass or plastic vial, or polyethylene bag; then
    - d. Place imbibed seed from a, b or c at 2-5°C for the length of time specified in Table 5 and maintain sufficient aeration and moisture to prevent seed from drying out.

4. Definition of paired tests in 4.2h, instructions for doing paired tests in 4.9l, and procedures for reporting paired tests in 4.7c:

ADOPTED PROPOSAL

Adopted proposal as amended from original (parentheses deleted in definition and sentences shifted in the instructions)--

- 1) 4.2h. Paired tests.--Test procedures used on seeds having an unknown degree of dormancy. Samples are tested both with and without prechill or other treatments prescribed for breaking dormancy. Refer to 4.9l(3) for trees and shrubs.
  - 2) 4.9l. Prechill and Paired tests.--  
(3) For paired tests, 400 seeds (four 100 seed replicates) shall be used for each test condition (with and without prechill). See Note under section 4.6. For some tree and shrub species in Table 5, dormancy may vary by geographic origin or year of collection. Paired tests (with and without prechill) are recommended for some species. These are designated in the "Additional Directions" column of Table 5 by the term "Paired tests." In cases where reliable information exists on variations in prechill requirements, this information is also supplied.
  - 3) 4.7c. When paired tests are made, percentage germination shall be reported for each test condition.
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5. Size of submitted sample for paired tests on tree and shrub seeds:

ADOPTED PROPOSAL

Revise the first sentence of 1.4a(6) to read as follows:

Tree and shrub seed samples shall consist of at least 600 seeds per sample for germination purposes (1,000 seeds for paired tests).

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6. Modification of light requirements in 4.9e for germination of tree and shrub seeds:

ADOPTED PROPOSAL

4.9e. Light.--Where light is prescribed in Tables 3 and 4, it should be provided by a cool white fluorescent source. The illuminance for dormant seed should be 75-125 ft-c (750-1250 lux). The seeds should be illuminated for at least 8 hours in every 24. Where the seeds are germinated at alternating temperatures, they should be illuminated during the high temperature period. Except for ryegrass fluorescence tests in rolled filter paper, seeds for which light is prescribed should be germinated on top of the substratum. Illuminance for non-dormant seed and during seedling development (to enable the essential structures to be evaluated with greater certainty) may be as low as 25 ft-c.

For tree and shrub seeds, light shall be provided as described above for all species in Table 5 with the following provisions: (a) Illuminance for non-dormant seed and during seedling development shall remain at 75-125 ft-c; (b) Up to 16 hours of light may be beneficial in some test conditions and for some lots, as noted in Table 5, but continuous light should not be used unless it is known that this does not inhibit germination of the species.

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7. Changes under Additional Directions in Table 5:

ADOPTED PROPOSAL

- 1) Under Additional Directions in Table 5 delete the word "Light" (when no time periods are also indicated) and delete prechill temperatures if present.
- 2) Under Additional Directions heading in Table 5, insert:  
(see Sec. 4.9e and 4.9l).

8. Designation of "Paired tests" and changes in the information for prechill, etc. under Additional Directions for some kinds listed in Table 5:

ADOPTED PROPOSAL

Adopted proposal as amended from original (incubation clarified with footnote and wording revised for some kinds)--

Under Additional Directions in Table 5, delete and add the information below for the following species:

Kind of seed	Additional Directions	Additional Directions
	Delete <u>Present Wording:</u>	Add <u>Adopted Wording:</u>
<u>Abies amabilis</u>	Light; prechill 0-5°C 14 days. Light; some sources may need prechill 21 days at 3-5°C.	Prechill 21 days.
<u>A. concolor</u>	Light; many lots complete in 14-21 days. A few sources from from the Pacific coast region may need prechill for 3 weeks at 3-5°C.	Paired tests. Pacific Coast sources may need 21 days prechill.
<u>A. grandis</u>	Light; prechill 14 days at 3-5°C. Vermiculite (P) is satisfactory. Dark; prechill 21 days at 3-5°C.	Prechill 14 days.
<u>A. lasiocarpa</u>	Light.	Prechill 21 days.
<u>A. procera</u>	Light; prechill 14 days at 3-5°C. Vermiculite is recommended if TB is not used. Dark; prechill 21 days at 3-5°C.	Prechill 14 days.
<u>Crataegus mollis</u>	2 hrs. H <sub>2</sub> SO <sub>4</sub> , followed by 90 days prechill at 20°C then 120 days at 3-5°C. TZ <sup>b</sup> may also be used.	Soak in conc. H <sub>2</sub> SO <sub>4</sub> for two hours, followed by 90 days incubation <sup>d</sup> at room temperature, then prechill 120 days. TZ <sup>b</sup> may also be used.
<u>Cupressus arizonica</u>	Light; some lots need 20 days prechill.	Paired tests. Some lots need 21 days prechill.

<u>Larix occidentalis</u>	Light; if dormant, prechill or use KNO <sub>3</sub> .	Paired tests. Prechill 21 days or use KNO <sub>3</sub> .
<u>Liriodendron tulipifera</u>	Prechill 60 days at 3-5°C; or use TZ or embryo excision.	Prechill 60-90 days.
<u>Nyssa sylvatica</u>	Prechill 21 days; very few lots dormant.	Prechill 28 days.
<u>Picea engelmannii</u>	Light; sensitive to excessive moisture; use KNO <sub>3</sub> if dormant.	Paired tests. Prechill 21 days or use KNO <sub>3</sub> .
<u>P. glauca</u>	Light; some Canadian seed sources require prechill for 14-21 days at 3-5°C.	Paired tests. Prechill 21 days.
<u>P. sitchensis</u>	Light; more than 8 hr light may be beneficial to some lots; if dormant add KNO <sub>3</sub> .	Paired tests. Prechill 21 days or use KNO <sub>3</sub> .
<u>Pinus canariensis</u>	Light; sensitive to warm temperatures; 1-day soak prior to test helpful.	Soak 1 day in water at room temperature prior to test.
<u>P. cembra</u>	Use embryo excision method <sup>a</sup> . TZ <sup>b</sup> may also be used. Prechill 6-9 months at 3-5°C.	Use embryo excision method <sup>a</sup> or TZ <sup>b</sup> . Prechill 180-270 days.
<u>P. cembroides</u>	Use embryo excision method <sup>a</sup> for dormant lots.	Paired tests. Prechill 21 days or use embryo excision method <sup>a</sup> .
<u>P. contorta</u> <u>var. latifolia</u>	Light; prechill 28 days at 3-5°C.	Paired tests. Prechill 21 days.
<u>P. coulteri</u>	Use embryo excision method <sup>a</sup> . Prechill for 8 or 12 weeks at 3-5°C.	Use embryo excision method <sup>a</sup> . Prechill 60-90 days.
<u>P. echinata</u>	Light; 8 hr light may be beneficial to some lots; sensitive to drying. No prechill and prechill 28 days at 3-5°C. 16 hrs. light (both methods each sample).	Paired tests. Prechill 14 days. Paired tests. Prechill 28 days. Use 16 hr light.
<u>P. elliotii</u>	Light; 8 hr light may be beneficial to some lots; sensitive to drying. Light; no prechill, and prechill 28 days at 3-5°C. 16 hr. light (both methods each sample).	(Delete remarks under this column)
<u>P. jeffreyi</u>	Light; embryo excision method applicable to dormant lots. Prechill for 4 or 8 weeks at 3-5°C.	Paired tests. Prechill 28 days or use embryo excision method <sup>a</sup> .

<u>P. lambertiana</u>	Use embryo excision method <sup>a</sup> . Prechill 8 or 12 weeks at 3-5°C.	Use embryo excision method <sup>a</sup> . Prechill 60-90 days.
<u>P. monticola</u>	Use embryo excision method <sup>a</sup> . Prechill 8 or 12 weeks at 3-5°C.	Use embryo excision method <sup>a</sup> . Prechill 60-90 days or incubated <sup>d</sup> 28 days at room temperature, then prechill 60 days.
<u>P. pinaster</u>	Light; sensitive to temperature and possibly moisture; some seed sources need prechill.	Paired tests. Prechill 28 days.
<u>P. pinea</u>	Light; soak 1 day prior to test; some lots sensitive to warm temperatures.	Soak 1 day in water at room temperature prior to test.
<u>P. ponderosa</u>	Light; prechill 28 days at 3-5°C.	Paired tests. Prechill 28-35 days.
<u>P. radiata</u>	Light; more than 8 hr may be beneficial; prefers good moisture supply; prechill 21 days at 3-5°C.	Prechill 21 days. More than 8 hr light may be beneficial.
<u>P. strobus</u>	Light; more than 8 hr light may be beneficial to some lots; sensitive to drying; prechill 28-42 days at 3-5°C.	Paired tests. Prechill 28-42 days. More than 8 hr light may be beneficial.
(Delete entire germination prescription for the second test method of <u>P. strobus</u> in the Rules)		
<u>P. sylvestris</u>	Light; seed from eastern Mediterranean (Turkey, Greece, Bulgaria) provinces may require prechill 21 days at 3-5°C.	Paired tests. Mediterranean sources may need 21 days prechill.
<u>P. taeda</u>	Light; more than 8 hr light may be beneficial to some lots; sensitive to drying. No prechill and prechill 28 days at 3-5°C. 16 hr light (both methods each sample).	Paired tests. Prechill 28 days.  Paired tests. Prechill 28 days. Use 16 hr light.
<u>P. virginiana</u>	16 hr light  Light; 8 hr light may be beneficial to some lots	(Delete remarks under this column)
<u>Pseudotsuga menziesii</u> var. <u>caesia</u>	Light; prechill 21 days at 3-5°C. Vermiculite recommended if TB not used.	Prechill 21 days.

<u>P. menziesii</u> var. <u>glauca</u>	Light; central and southern Rocky Mountain sources not sensitive to temperature. Vermiculite recommended if TB not used.	Paired tests. Prechill 21 days.
<u>P. menziesii</u> var. <u>menziesii</u>	Light; prechill 21 days at 3-5°C. Vermiculite or Perlite (sponge rock) recommended if TB not used.	Paired tests. Prechill 21 days.
<u>Sequoiadendron giganteum</u>	Light; sensitive to drying; may prechill 30 days.	Paired tests. Prechill 30 days.
<u>Thuja plicata</u>	Light; use KNO <sub>3</sub> if dormant.	(Delete remarks under this column)
<u>Tsuga heterophylla</u>	Light.	Paired tests. Prechill 21 days.

Add the following footnote to Table 5:

d For incubation use prechill procedures in 4.9ℓ(2) but substitute warmer temperature in place of 2-5°C.

9. Deletion of statements under Additional Directions for several species in Table 5:

ADOPTED PROPOSAL

Under Additional Directions in Table 5, delete the following:

"sensitive to drying in test" for Liquidambar styraciflua, "sensitive to excess moisture" for Pinus clausa, and "sensitive to warm temperature" for Pinus halepensis.

10. Change in germination prescriptions for Acer species in Table 5:

ADOPTED PROPOSAL

Adopted proposal as amended from original (length of test changed for silver maple)--

Kind of seed	Substrata	Temperature °C.	Test duration days	Additional Directions
<u>Acer rubrum</u> red maple	TB	20-30	21	Northern U.S. and Canadian sources need 45-60 days prechill. Southern U.S. sources need no prechill.
<u>Acer saccharinum</u> silver maple	TB	20-30	14	
<u>Acer spp.</u> (all other maples, boxelder-see Purity Table 1).	TB P	20-30 18-22	28 14	Prechill 45-130 days. Use embryo excision method <sup>a</sup> .



11. Change in germination prescriptions for Chamaecyparis species in Table 5:

ADOPTED PROPOSAL

Adopted proposal as amended from original (Additional Directions changed for Chamaecyparis lawsoniana)--

Kind of seed	Substrata	Temperature °C.	Test duration days	Additional Directions
<u>Chamaecyparis lawsoniana</u> Port Orford cedar	TB, P	20	28	Paired tests. Use KNO <sub>3</sub> .
<u>Chamaecyparis nootkatensis</u> Alaska cedar	TB, P	20	28	Incubated <sup>d</sup> 28 days at room temperature, then prechill 120 days.

12. Change in germination prescription for Cornus stolonifera in Table 5:

ADOPTED PROPOSAL

Kind of seed	Substrata	Temperature °C.	Test duration days	Additional Directions
<u>Cornus stolonifera</u> red-osier dogwood	TB, TC	20-30	28	Prechill 120-160 days. TZ <sup>b</sup> may also be used.

13. Change in germination prescriptions for Fraxinus species in Table 5:

ADOPTED PROPOSAL

Adopted proposal as amended from original (Additional Directions changed for several kinds)--

Kind of seed	Substrata	Temperature °C.	Test duration days	Additional Directions
<u>Fraxinus americana</u> white ash	P	18-22	10-14	Use embryo excision method <sup>a</sup> . TZ <sup>b</sup> may also be used.
	TB, TC	15-25	28	Northern sources more dormant than southern. Prechill 60-140 days.
<u>Fraxinus pennsylvanica</u> green ash	TB, TC	20-30	28	Prechill southern sources 60-90 days. Prechill northern sources up to 140 days (30-60 day incubation <sup>d</sup> at room temperature prior to prechill may be helpful).

<u>Fraxinus excelsior</u> European ash	P	18-22	10-14	Use embryo excision method <sup>a</sup> . TZ <sup>b</sup> may also be used.
	TB	20-30	28	Incubated <sup>d</sup> 60-90 days at room temperature, then prechill 90 days.
<u>Fraxinus latifolia</u> Oregon ash	P	18-22	10-14	Use embryo excision method <sup>a</sup> . TZ <sup>b</sup> may also be used.
	TB	20-30	28	Incubated <sup>d</sup> 60-90 days at room temperature, then prechill 90 days.
<u>Fraxinus nigra</u> black ash	P	18-22	10-14	Use embryo excision method <sup>a</sup> . TZ <sup>b</sup> may also be used.
	TB	20-30	28	Incubated <sup>d</sup> 60-90 days at room temperature, then prechill 90 days.

14. Change under Additional Directions for Betula spp. in Table 5:

ADOPTED PROPOSAL

Adopted proposal as amended from original (Additional Directions added for two species)---

Kind of seed

Additional Directions  
Adopted Wording:

Betula alleghaniensis

Paired tests.  
Prechill 21 days.

Betula papyrifera

Use 16 hr light.

Betula spp.  
(other birches)

More than 8 hr light  
may be beneficial.

15. Change in germination prescription for Begonia spp. in Table 4:

ADOPTED PROPOSAL

Substrata	Temperature °C.	First Count days	Final Count days	Additional Directions
P, TB	20	14	21	Light.

16. Change in germination prescription for Molucella laevis L. in Table 4:

ADOPTED PROPOSAL

Substrata	Temperature °C.	First Count days	Final Count days	Additional Directions
P, T, TB	10-30; 15-25; 20-30	7	21	Light; prechill 7 days at 5°C. Use embryo excision method <sup>d</sup> .

17. Change in genus name and germination prescription for geranium in Table 4:

ADOPTED PROPOSAL

Adopted proposal as amended from original (footnote c to Table 4 revised)---

Kind of seed	Substrata	Temperature °C.	First count days	Final count days
<u>Pelargonium</u> spp. geranium	B, T, TB	20	7	28 <sup>c</sup>
Alternate method (for clipped and scarified seeds)	B, T, TB	20	7	14 <sup>c</sup>

<sup>c</sup> Hard seeds often present. See sections 4.9k(6) and 4.2d.

18. Change in germination prescription for Petunia Table 4:

ADOPTED PROPOSAL

Adopted proposal as amended from original (Final Count changed)---

Kind of seed	Substrata	Temperature °C.	First count days	Final count days	Additional Directions
<u>Petunia</u> spp. petunia	P, TB	20-30; 20	7	14	Light; KNO <sub>3</sub> and prechilling may be necessary for certain cultivars. Seedling appearance varies with cultivar and the short-rooted types (dwarf compact, ruffled, and double flowered) may be more easily evaluated when tested at 20°C.

19. Change in germination prescription for Viola cornuta in Table 4:

ADOPTED PROPOSAL

Substrata	Temperature °C.	First Count days	Final Count days	Additional Directions
TB	20; 20-30	7	21	Prechill 7 days at 5°C with KNO <sub>3</sub> .

20. Change in germination prescription for Viola tricolor in Table 4:

ADOPTED PROPOSAL

Substrata	Temperature °C.	First Count days	Final Count days	Additional Directions
TB	20; 20-30	7	21	Prechill 7 days at 5°C with KNO <sub>3</sub> .

21. Addition of Elymus elymoides to the Rules:

ADOPTED PROPOSAL

Adopted proposal as amended from original (hyphen added between common name)--

1) Include in Table 1 (Weights for working samples, AGRICULTURAL SEEDS) the following:

Kind of seed	Minimum weight for purity analysis Grams	Minimum weight for noxious-weed seed examination Grams	Approximate number of seeds per gram Number	Approximate number of seeds per ounce Number
<u>Elymus elymoides</u> (Rafinesque) Swezey bottlebrush- squirreltail	9	90	190-520 (300)	5,400- 14,800

2) Add Elymus elymoides to the second sentence in section 2.6b (3) for seed unit classification.

3) Include in Table 3 (Methods of testing for laboratory germination, AGRICULTURAL SEEDS) the following:

Kind of seed	Substrata	Temperature °C	First count days	Final count days
<u>Elymus elymoides</u> bottlebrush- squirreltail	P, B	15; 20	10	14 <sup>d</sup>

<sup>d</sup>Determine viability of ungerminated seeds; see section 4.2e and 4.9k.

4) Section 6e (Other grasses of APPENDIX 1. Seedling Descriptions shall be used for normal and abnormal classification.

5) Add this species to Handbook No. 25 (Uniform Classification of Weed and Crop Seeds) and consider it as classification 3.

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22. Addition of Penstemon eatonii to the Rules:

ADOPTED PROPOSAL

Adopted proposal as amended from original (footnote c corrected to e)--

1) Include in Table 4 (Methods of testing for laboratory germination, FLOWER SEEDS) the following:

Kind of seed	Substrata	Temperature °C.	First count days	Final count days	Additional Directions
<u>Penstemon eatonii</u> A. Gray Firecracker penstemon	P	15	7	21	Prehill 60 days at 3-5°C; or use TZe.

2) Add the following footnote after Table 4:  
eT.Z. tetrazolium; see section 4.9k(2).

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23. Addition of Penstemon palmeri to the Rules:

ADOPTED PROPOSAL

Include in Table 4 (Methods of testing for laboratory germination, FLOWER SEEDS) the following:

Kind of seed	Substrata	Temperature °C.	First count days	Final count days	Additional Directions
<u>Penstemon palmeri</u> A. Gray Palmer penstemon	P	15	14	28	Light.

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24. Addition of Penstemon strictus to the Rules:

ADOPTED PROPOSAL

Include in Table 4 (Methods of testing of laboratory germination, FLOWER SEEDS) the following:

Kind of seed	Substrata	Temperature °C.	First count days	Final count days	Additional Directions
<u>Penstemon strictus</u> Bentham Rocky Mountain penstemon	P	15	7	21	Light.