

RULES PROPOSALS 1990

AOSA Rules Committee
David F. Svik, Chairman

The following proposals for changes in or additions to the AOSA Rules for Testing Seeds have reviewed and approved by the Rules Committee. Approval does not mean that the Committee or it's members endorse these proposals to the Rules.

Twenty-seven proposals are presented here as required by the Constitution so the membership can review them prior to voting on them at the 1990 June business meeting in Maryland. Please read and evaluate these proposals carefully so that you are able to cast a well informed vote on them. The name and address of the submitter(s) is given if you wish to contact them for additional information or have comments.

Comments concerning any of these proposals should be made in writing to the Rules Committee Chairman before the June meeting. These comments will be discussed at the open Rules Committee meeting at that time. Extensive adjustments to proposals are possible at the open meeting but are not encouraged by the Rules Committee.

Please note: Only a limited number of copies of the proposals will be available at the Open Rules meeting. Therefore, it is advisable that you bring a copy of the proposals or this Newsletter with you to the June meeting.

1. PROPOSAL

Addition of "dark" as a specific requirement in Additional Directions for western wheatgrass in Table 3.

PRESENT RULE

Kind	Subs.	Temp. C	First Count Days	Final Count Days	Specific require- ments	Fresh and dormant seed
<u>Elymus smithii</u> western wheatgrass	B,P,T	15-30	7	28 d		KNO3 or soil

PROPOSED RULE

<u>Elymus smithii</u> western wheatgrass	B,P,T	15-30	7	28 d	Dark	KNO3 or soil
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SUPPORTING EVIDENCE

Delouche and Bass (1954) found that presence of light during western wheatgrass germination tests reduced germination by 10% across 26 lots compared to germination with dark conditions .

LITERATURE CITED

Delouche, J.C. and L.N. Bass. 1954. Effect of light and darkness upon the germination of western wheatgrass, (Elymus smithii L.) Proc. Assoc. Off. Seed Anal. 44:105-113.

SUBMITTED BY

Tim Gutormson
SDSU Seed Testing Laboratory
Brookings, South Dakota 57007

2. PROPOSAL

Reduce final count to 14 days for blue grama in Table 3.

PRESENT RULE

Substrata	Temp C	First Count Days	Final Count Days	Additional Directions	
				Specific requirements	Fresh and dormant seed
P, TB	20-30	7	28 ^d	LIGHT	KNO ₃

PROPOSED RULE

Substrata	Temp C	First Count Days	Final Count Days	Additional Directions	
				Specific requirements	Fresh and dormant seed
P, TB	20-30	7	14 ^d	LIGHT	KNO ₃

SUPPORTING EVIDENCE

The proposed rule change would reduce the germination test length by 14 days. Data collected from laboratories on blue grama germination are presented in Table 1. Data presented in Table 1 represents 734 seed lots which received 0 days of prechill followed by germination testing up to 28 days. Germination in the first 14 days of testing equaled 65.1% and only 3.2% additional germination occurred in the last 14 days of testing. Data presented in Tables 1 indicates that the length of germination testing could be shortened by 14 days without substantially reducing germination percentages. Dormant seed percentages would increase from 3 to 4% based on these data. Implementation of this change would reduce laboratory testing time and possibly reduce the effect of saprophytic organisms on seed viability.

Table 1. Blue grama (*Boutelous gracilis*) viability data collected from 4 laboratories representing 734 seed samples tested from 1986-1989 which were prechilled for 0 days, germinated at 20/30 C with light and 0.2% KNO₃.

LAB	YEAR	PC	GERMINATION COUNTS					DORM-ANT	GERM + DORM	DAYS TESTED	SEED-LOTS	
			7	14	21	28	TOTAL					
TX-LUBB	87-88	0	46	21	-	-	67	3	70	14	76	
TX-LUBB	87-88	0	51	14	5	0	70	0	70	21	19	
TX-LUBB	86-88	0	33	21	4	5	63	2	65	28	275	
ARK	87-89	0	61	7	4	-	72	7	79	21	119	
NEW MEX	86-89	0	53	11	2	1	67	0	67	28	215	
AVS	87-88	0	67	6	1	0	74	1	75	28	30	
AVERAGE/TOTAL ¹			0	51.8	13.3	2.7	1	68.8	2.2	71	--	734

¹ Average/totals are not weighted based on sample number per laboratory.

SUBMITTED BY

Rangegrass Analysis Subcommittee
Tim Gutormson, Chairman

3. PROPOSAL

Reduce final count to 14 days for sideoats grama in Table 3.

PRESENT RULE

Substrata	Temp C	First Count Days	Final Count Days	Additional Directions	
				Specific requirements	Fresh and dormant seed
P	15-30	7	28 ^d	LIGHT, KNO ₃	

PROPOSED RULE

Substrata	Temp C	First Count Days	Final Count Days	Additional Directions	
				Specific requirements	Fresh and dormant seed
P	15-30	7	14 ^d	LIGHT, KNO ₃	

SUPPORTING EVIDENCE

The proposed rule change would reduce the germination test length by 14 days. Data collected from laboratories on sideoats grama germination are presented in Tables 1, 2, and 3.

Data presented in Table 1 represents 354 seed lots which received 14 days of prechill followed by germination testing for 28 days. Germination in the first 14 days of testing equaled 50.5% compared to 3% additional germination in the last 14 days of testing. These data indicate that the germination testing period could be shortened to 14 days without greatly increasing dormant seed percentages.

Data presented in Table 2 represents 76 seed lots which received 7 days of prechill followed by 28 days of germination testing. Germination in the first 14 days equaled 56% and 11% additional germination occurred in the last 14 days of testing. Shortening the germination test to 14 days on these seed lots would increase dormant seed percentages by 11%.

Table 3 data represents 899 seed lots which received 0 days of prechill followed by germination testing of 13 to 28 days. Germination in the first 14 days of testing equaled 49.8% with only 3.2% additional germination occurring with further testing. These data indicate that a germination testing period of 14 days would increase dormant seed only 3 to 4 percent.

Data presented in Tables 1 and 3 indicate that reducing germination testing time to 14 days would not substantially increase seed dormancy. Table 2 data shows

dormant seed percentages would increase by 11% if the germination test is reduced to 14 days. Data in Table 2 represents 76 seed lots compared to 1253 seed lots in Tables 1 and 3. Implementation of this change would reduce laboratory testing time and not significantly increase seed dormancy based on Table 1 and 3 data.

Table 1. Sideoats grama (*Bouteloua curtipendula*) viability data collected from 2 seed laboratories representing 354 seed samples tested from 1986-1989 which were prechilled for 14 days, germinated at 15/30 C with light and 0.2% KNO₃.

LAB	YEAR(s)	DAYS PC	GERMINATION COUNTS					DORM- ANT	GERM + DORM	DAYS TESTED	NO. OF SEED- LOTS
			days								
			7	14	21	28	TOTAL				
CO	86-89	14	33	9	2	1	45	11	56	42	256
NCIA	88-89	14	45	14	3	0	62	3	65	42	98
AVERAGE/TOTAL ¹			39	11.5	2.5	0.5	53.5	7	60.5	--	354

¹ Average/totals are not weighted based on sample number per laboratory.

Table 2. Sideoats grama (*Bouteloua curtipendula*) viability data collected from 2 seed laboratories representing 76 seed samples tested from 1986-1989 which were prechilled for 7 days, germinated at 15/30 C with light and 0.2% KNO₃.

LAB	YEAR(s)	DAYS PC	GERMINATION COUNTS					DORM- ANT	GERM + DORM	DAYS TESTED	NO. OF SEED- LOTS
			days								
			7	14	21	28	TOTAL				
TX-STEP	87-89	7	41	14	6	3	64	3	67	35	57
TX-GIDD	86-88	7	44	13	11	2	70	10	80	35	19
AVERAGE/TOTAL ¹			42.5	13.5	8.5	2.5	67	6.5	73.5	--	76

¹ Average/totals are not weighted based on sample number per laboratory.

Table 3. Sideoats grama (*Bouteloua curtipendula*) viability data collected from 7 seed laboratories representing 899 seed samples tested from 1985-1989 which were prechilled for 0 days, germinated at 15/30 C with light and 0.2% KNO₃.

LAB	YEAR(s)	DAYS PC	GERMINATION COUNTS					DORM- ANT	GERM + DORM	DAYS TESTED	NO. OF SEED- LOTS
			days								
			7	14	21	28	TOTAL				
TX-STEP	87-89	0	35	12	6	3	56	10	66	28	135
TX-GIDD	85-88	0	49	9	2	3	63	6	69	28	311
WYOM	87-88	0	49	13	2	1	65	4	69	28	6
ARKAN	87-88	0	37	6	1	0	44	10	54	28	32
TX-LUBB	86-89	0	19	13	2	3	37	7	44	28	221
NEW MEX	86-89	0	53	11	3	1	68	8	76	28	116
AVS	87-88	0	33	4	1	0	38	5	43	28	18
TX-LUBB	87-88	0	31	14	1	-	46	21	67	21	10
TX-LUBB	87-88	0	43	17	-	-	60	1	61	14	50
AVERAGE/TOTAL ¹			38.8	11	2	1.2	53	8	61	--	899

¹ Average/totals are not weighted based on sample number per laboratory.

SUBMITTED BY

Rangegrass Analysis Subcommittee
Tim Gutormson, Chairman

4. PROPOSAL

Reduce final count to 14 days for switchgrass in Table 3.

PRESENT RULE

Substrata	Temp C	First Count Days	Final Count Days	Additional Directions	
				Specific requirements	Fresh and dormant seed
P,TS	15-30	7	28 ^d	Light KNO ₃	Prechill at 5 C for 2 weeks

PROPOSED RULE

Substrata	Temp C	First Count Days	Final Count Days	Additional Directions	
				Specific requirements	Fresh and dormant seed
P,TS	15-30	7	14 ^d	Light, KNO ₃	Prechill at 5 C for 2 weeks

SUPPORTING EVIDENCE

The proposed rule change would reduce the germination test length by 14 days. Data collected from laboratories on switchgrass germination are presented in Tables 1, 2, and 3.

Data presented in Table 1 represents 861 seed lots which received a 14 day prechill followed by germination testing up to 28 days. Germination in the first 14 days of testing equaled 57.9% compared to 0.2% additional germination occurring during the remainder of the testing period. Data presented in Table 1 indicates that the germination test length could be reduced to 14 days without substantially decreasing germination percentages.

Table 2 data represents 23 seed lots which received a 7 day prechill followed by germination testing up to 21 days. Germination in the first 14 days of testing equaled 40.5% with only 3.5% additional germination occurring during the remainder of the testing period. These data also support a reduction in germination testing time.

Data presented in Table 3 represents 163 seed lots which received 0 days of prechill followed by germination testing for 28 days. Germination in the first 14 days of testing equaled 55.7% compared to 5.3% additional germination occurring during the last 14 days of testing. Reduction of the germination test length to 14 days would not significantly reduce germination and only increase dormant seed percentages by 5.3% based on Table 3 data.

Table 1, 2, and 3 data all indicate that germination testing time could be

reduced to 14 days without causing a substantial decrease in germination percentages. Dormant seed percentages would tend to increase from 0 to 6% based on these data. Implementation of this change would reduce laboratory testing time and possibly decrease the effect of saprophytic organisms on seed viability.

Table 1. Switchgrass (*Panicum virgatum*) viability data collected from 5 seed laboratories representing 861 seed samples tested from 1985 to 1989 which were prechilled for 14 days, germinated at 15/30 C with light and 0.2% KNO_3 .

LAB	YEAR(s)	DAYS PC	GERMINATION COUNTS					DORM- ANT	GERM + DORM	DAYS TESTED	NO. OF SEED- LOTS
			7	14	21	28	TOTAL				
CO	86-89	14	57	6	1	0	64	3	87	42	167
NEW MEX	88-89	14	58	19	0	0	77	1	78	42	2
MN	1988	14	55	5	0	-	60	0	60	35	31
NCLA	88-89	14	62	13	0	-	75	5	80	35	420
SDSU	85-87	14	48	11	-	-	59	7	66	28	270
TX-GIDD	86-87	14	0	17	0	0	18	0	18	42	1
AVERAGE/TOTAL ¹			46.7	11.8	0.2	0	58.7	2.7	61.4	--	861

¹ Average/totals are not weighted based on sample number per laboratory.

Table 2. Switchgrass (*Panicum virgatum*) viability data collected from 1 seed laboratory representing 23 seed samples tested from 1986 to 1989 which were prechilled for 7 days, germinated at 15/30 C with light and 0.2% KNO_3 .

LAB	YEAR(s)	DAYS PC	GERMINATION COUNTS					DORM- ANT	GERM + DORM	DAYS TESTED	NO. OF SEED- LOTS
			7	14	21	28	TOTAL				
TX-LUBB	87-88	7	43	9	0	0	52	2	54	21	8
TX-LUBB	86-89	7	34	15	3	4	56	11	67	35	15
AVERAGE/TOTAL ¹			38.5	12	1.5	2	54	6.5	60.5	--	23

¹ Average/totals are not weighted based on sample number per laboratory.

Table 3. Switchgrass (*Panicum virgatum*) viability data collected from 3 seed laboratories representing 163 seed samples tested from 1985 to 1989 which were prechilled for 0 days, germinated at 15/30 C with light and 0.2% KNO_3 .

LAB	YEAR(s)	DAYS PC	GERMINATION COUNTS					DORM- ANT	GERM + DORM	DAYS TESTED	NO. OF SEED- LOTS
			7	14	21	28	TOTAL				
TX-GIDD	85-89	0	35	29	4	1	69	2	71	28	133
WYOM	87-89	0	40	15	2	1	58	19	77	28	11
TX-LUBB	86-87	0	32	16	7	1	56	0	56	28	19
AVERAGE/TOTAL ¹			35.7	20	4.3	1	61	7	68	--	163

¹ Average/totals are not weighted based on sample number per laboratory.

SUBMITTED BY

Rangegrass Analysis Subcommittee
Tim Gutormson, Chairman

5. PROPOSAL

Reduce final count to 14 days for sand bluestem in Table 3.

PRESENT RULE

Substrata	Temp C	First Count Days	Final Count Days	Additional Directions	
				Specific requirements	Fresh and dormant seed
P,TS	20-30	7	28 ^d	Light;KNO ₃	Prechill at 5 C for 2 weeks

PROPOSED RULE

Substrata	Temp C	First Count Days	Final Count Days	Additional Directions	
				Specific requirements	Fresh and dormant seed
P,TS	20-30	7	14 ^d	Light;KNO ₃	Prechill at 5 C for 2 weeks

SUPPORTING EVIDENCE

The proposed rule change would reduce the germination test length by 14 days. Data collected from laboratories on sand bluestem germination are presented in Table 1. Data in Table 1 represents 116 seed lots which received a 14 day prechill followed by germination testing up to 28 days. Germination in the first 14 days of testing equaled 65% and only 1.3% additional germination occurred during the remaining testing time. These data indicated that the length of the germination test could be shortened by 14 days without substantially reducing germination percentages. Dormant seed percentages would increase by 1 to 2% based on these data. Implementation of this change would reduce laboratory testing time and possibly reduce the effect of saprophytic organisms on seed viability.

Table 1. Sand bluestem (*Andropogon halli*) viability data collected from 6 seed laboratories representing 116 seed samples tested from 1985 to 1989 which were prechilled for 14 days, germinated at 20/30 C and 0.2% KNO₃.

LAB	YEAR(s)	DAYS FC	GERMINATION COUNTS					DORM-ANT	GERM + DORM	DAYS TESTED	NO. OF SEED-LOTS
			7	14	21	28	TOTAL				
TX-GIDD	85-88	14	64	2	1	2	69	0	69	42	26
WYOM	87-89	14	29	21	3	0	53	2	55	42	5
TX-STEP	87-89	14	55	8	1	0	64	0	64	42	21
CO	86-89	14	61	10	1	0	72	1	73	42	24
NCIA	88-89	14	55	24	0	-	79	0	79	35	34
TX-LUBB	87	14	55	6	-	-	61	0	61	28	6
AVERAGE/TOTAL ¹			53.2	11.8	1	0.3	66.3	0.5	66.8	--	116

¹ Average/totals are not weighted based on sample number per laboratory.

SUBMITTED BY: Rangelass Analysis Subcommittee; Tim Gutormson, Chairman

6. PROPOSAL

Reduce final count to 14 days for Indiangrass in Table 3.

PRESENT RULE

Substrata	Temp C	First Count Days	Final Count Days	Additional Directions	
				Specific requirements	Fresh and dormant seed
P, TS	20-30	7	28 ^d	Light; KNO ₃	Prechill at 5 C for 2 weeks

PROPOSED RULE

Substrata	Temp C	First Count Days	Final Count Days	Additional Directions	
				Specific requirements	Fresh and dormant seed
P, TS	20-30	7	14 ^d	Light; KNO ₃	Prechill at 5 C for 2 weeks

SUPPORTING EVIDENCE

The proposed rule change would reduce the germination test length by 14 days. Data collected from laboratories on Indiangrass germination are presented in Table 1. Data in Table 1 represents 427 seed lots which received a 14 day prechill followed by germination testing up to 28 days. Germination in the first 14 days equaled 56.4% and only 2% additional germination occurred in the last 14 days of testing. The data presented in Table 1 indicates that the length of germination testing could be shortened by 14 days without substantially reducing germination percentages. Dormant seed percentages would increase approximately 2% based on these data. Implementation of this change would reduce laboratory testing time and possibly reduce the effect of saprophytic organisms on seed viability.

Table 1. Indiangrass (*Sorghastrum nutans*) viability data collected from eight seed laboratories representing 427 seed samples tested from 1985 to 1989 which were prechilled for 14 days, germinated at 20/30 C with light and 0.2% KNO₃

LAB	YEAR(s)	DAYS PC	GERMINATION COUNTS				DORM-ANT	GERM + DORM	DAYS TESTED	NO. OF SEED-LOTS	
			7	14	21	28					TOTAL
WYOM	87-89	14	21	14	3	7	45	12	57	42	9
TX-GIDD	85-88	14	64	2	1	1	68	1	69	42	80
CO	86-89	14	53	3	0	0	56	6	62	42	135
TX-STEP	87-89	14	65	5	1	0	71	0	71	42	20
NEW MEX	88-89	14	74	14	1	0	89	4	93	42	2
NCLIA	88-89	14	35	17	2	0	54	12	66	42	84
SDSU	86-87	14	28	9	-	-	37	22	59	28	89
MN	88	14	44	3	-	-	47	0	47	31	8
AVERAGE/TOTAL ¹			48	8.4	1	1	58.4	7.1	65.5	--	427

¹ Average/total values are not weighted based on sample number per laboratory.

SUBMITTED BY: Rangeland Analysis Subcommittee; Tim Gutormson, Chairman

7. PROPOSAL

Reduce final count to 14 days for little bluestem in Table 3.

PRESENT RULE

Substrata	Temp C	First Count Days	Final Count Days	Additional Directions	
				Specific requirements	Fresh and dormant seed
P, TS	20-30	7	28 ^d	Light; KNO ₃	Prechill at 5 C for 2 weeks

PROPOSED RULE

Substrata	Temp C	First Count Days	Final Count Days	Additional Directions	
				Specific requirements	Fresh and dormant seed
P, TS	20-30	7	14 ^d	Light; KNO ₃	Prechill at 5 C for 2 weeks

SUPPORTING EVIDENCE

The proposed rule change would reduce the germination test length by 14 days. Data collected from laboratories on little bluestem germination are presented in Tables 1 and 2. Data in Table 1 represents 510 seed lots which received a 14 day prechill followed by germination testing up to 28 days. Germination in the first 14 days of testing equaled 55.6% and only 3.2% additional germination occurred in the last 14 days of testing. Data presented in Table 2 represents 44 seed lots which received no prechill treatment and were germination tested for 28 days. Again the majority of seeds germinated within the first 14 days and only 2% more seeds germinated in the last 14 days of germination testing. Data presented in Tables 1 and 2 indicates the length of germination testing could be shortened by 14 days without substantially reducing germination percentages. Dormant seed percentages would increase from 3 to 4% based on these data. Implementation of this change would reduce laboratory testing time and possibly reduce the effect of saprophytic organisms on seed viability.

Table 1. Little bluestem (*Schizachyrium scoparium*) viability data collected from 8 seed laboratories representing 510 seed samples tested from 1985 to 1989 which were prechilled for 14 days, germinated at 20/30 C with light and 0.2% KNO₃.

LAB	YEAR(s)	DAYS PC	GERMINATION COUNTS					DORM- ANT	GERM + DORM	DAYS TESTED	NO. OF SEED- LOTS
			days								
			7	14	21	28	TOTAL				
CO	86-89	14	59	7	1	0	67	5	72	42	139
MN	87	14	27	1	-	-	28	0	28	27	3
SDSU	86-87	14	45	6	-	-	51	2	53	28	17
TX-STEP	87-88	14	42	10	1	0	53	1	54	42	78
TX-LUBB	87-88	14	29	22	-	-	51	3	54	28	9
TX-LUBB	86-87	14	29	26	3	2	60	1	61	42	41
TX-GIDD	85-86	14	54	4	1	1	60	0	60	42	135
NEW MEX	88-89	14	56	12	14	5	87	0	87	42	2
NCIA	88-89	14	56	15	1	-	72	0	72	35	86
AVERAGE/TOTAL ¹			44.1	11.5	2.3	0.9	58.8	1.3	60.1	--	510

¹ Average/totals are not weighted based on sample number per laboratory.

Table 2. Little bluestem (*Schizachyrium scoparium*) viability data collected from 5 seed laboratories representing 44 seed samples tested from 1985 to 1989 which were prechilled for 0 days, germinated at 20/30 C with light and 0.2% KNO₃.

LAB	YEAR(s)	DAYS PC	GERMINATION COUNTS					DORM- ANT	GERM + DORM	DAYS TESTED	NO. OF SEED- LOTS
			days								
			7	14	21	28	TOTAL				
TX-GIDD	85-88	0	39	17	0	0	56	7	63	28	5
NEW MEX	88-89	0	73	3	0	0	76	0	76	28	3
ARK	87-89	0	22	9	5	0	36	42	79	28	15
WYOM	87-89	0	39	9	2	0	50	2	52	28	13
AUS	87-88	0	12	11	7	1	31	45	76	28	8
AVERAGE/TOTAL ¹			37	9.8	2.8	0.2	49.8	19.2	69	--	44

¹ Average/totals are not weighted based on sample number per laboratory.

SUBMITTED BY

Rangegrass Analysis Subcommittee
Tim Gutormson, Chairman

8. PROPOSAL

Reduce final count to 14 days for big bluestem in Table 3.

PRESENT RULE

Substrata	Temp C	First Count Days	Final Count Days	Additional Directions	
				Specific requirements	Fresh and dormant seed
P,TS	20-30	7	28 ^d	Light, KNO ₃	Prechill at 5 C for 2 weeks

PROPOSED RULE

Substrata	Temp C	First Count Days	Final Count Days	Additional Directions	
				Specific requirements	Fresh and dormant seed
P,TS	20-30	7	14 ^d	Light, KNO ₃	Prechill at 5 C for 2 weeks

SUPPORTING EVIDENCE

The proposed change would reduce the germination test length by 14 days. Data collected from laboratories on big bluestem germination are presented in Table 1. All samples received a 14 day prechill and germination counts were made every 7 days. Germination at 7 and 14 days equaled 65% and less than 2% additional germination occurred during the last 14 days of testing. Seed dormancy percentages averaged 0.9%. This data represents 300 big bluestem samples with differing dormancy levels and growing environments. The reduction of 14 days of germination testing time will slightly increase dormant seed percentages, but would not substantially reduce germination percentages. Implementation of this change would reduce laboratory testing time and possibly reduce the effect of saprophytic organisms on seed viability.

Table 1. Big bluestem (*Andropogon gerardii*) viability data collected from seven seed laboratories representing 300 seed samples tested from 1985 to 1989 which were prechilled for 14 days, germinated at 20/30 C with light and 0.2% KNO₃.

LAB	YEAR(s)	DAYS PC	GERMINATION COUNTS					DORM- ANT	GERM + DORM	DAYS TESTED	NO. OF SEED- LOTS
			days				TOTAL				
			7	14	21	28					
MN	1987	14	49	0	5	-	54	-	54	35	9
CO	86-89	14	57	9	1	0	67	2	69	42	52
NE CIA	88-89	14	57	18	1	-	76	3	79	35	134
SDSU	85-88	14	41	13	-	-	54	3	57	28	77
TX-STEP	87-88	14	62	3	1	-	66	0	66	35	6
TX-LUB	1988	14	81	1	-	-	82	0	82	28	1
TX-LUB	1987	14	42	12	-	4	58	0	58	42	4
TX-LUB	1986	14	53	21	0	0	74	0	74	42	2
TX-GIDD	85-88	14	59	4	0	0	63	0	63	35	15
AVERAGE/TOTAL ¹		14	56	9	0.9	0.4	66	0.9	66.9	--	300

¹ average/totals are not weighted based on sample number per laboratory.

SUBMITTED BY

Rangegrass Analysis Subcommittee
Tim Gutormson, Chairman

PROPOSAL NO. 9

Addition of Alopecurus arundinaceus - Creeping Foxtail to the Rules.

PRESENT RULE

New Rule

PROPOSED RULE

(1) Include in Table 1. (Weights for working sample, Agricultural Seeds) the following:

<u>Kind of Seed</u>	Min. Wt. for		App. No. Seeds	
	<u>Purity Anal.</u>	<u>Nox. Anal.</u>	<u>/Gr.</u>	<u>/Oz.</u>
<u>Alopecurus</u> <u>arundinaceus</u> Creeping Foxtail	1.5	15	1880	53,300

(2) Include in Table 3. (Methods of testing for laboratory germination, Agricultural Seeds) the following:

<u>Kind of Seed</u>	<u>Substrata</u>	<u>Temp. C</u>	<u>1st/Final</u> <u>Count</u>	<u>Add. Dir.</u>
<u>Alopecurus</u> <u>arundinaceus</u> Creeping Foxtail	P	20-30	7-21	Light, KNO3

SUPPORTING EVIDENCE

Information for testing was obtained from "Species without AOSA Testing Procedures", The Newsletter, Volume 60 No. 2, February 1986.

Proposal was also based on data from research in a technical paper entitled "Purity and Germination Testing of Garrison Creeping Foxtail (Alopecurus arundinaceus) by R.C. Kinch published in the AOSA Newsletter, August 1975. His research showed that "the 21 day germination test had the highest average of all tests."

Tests performed on Creeping Foxtail received in the Nebraska State Seed Laboratory the past 8 years also showed that the germination test could be concluded at 21 days instead of 28 days as is listed in "Species without AOSA Testing Procedures".

SUBMITTED BY:

David Svik and Marge Pape
Nebraska State Seed Laboratory
Lincoln, NE 68502

PROPOSAL

NO. 10

KIND OF SEED (Scientific and common name):

Please see attachment

PRESENT RULE (If this is a new rule, state "new rule"):

New rule

PROPOSED RULE (Type exactly as it should appear in the rules):

See attachment

Table 1. Weights for working samples: Flowers

SUPPORTING EVIDENCE OR REASONS FOR THE PROPOSED RULE (In this space, summarize your reasons for making the proposed change or addition. As supporting evidence, attach 9 copies of summarized research data, literature citations, photocopies of published papers, and any other information helpful to the Rules Committee in making a decision):

We are finding increasing need for purities and seed counts on flowers. These counts have not been done.

Seed counts (number of seeds per gram) or samples have been provided from eight sources. Summary of the counts are provided in an attachment for supporting evidence. Also where possible, the ISTA weights for flowers were compared to the information obtained.

Information was also handed out at the June '89 meeting at the flower seed committee meeting for review. Suggestions have been reviewed and incorporated. Please see letter and attachment.

SUBMITTED BY: (Name, address, and phone number)

Barbara Atkins, RST

Seed Testing of America, 950 Boston Ave. Longmont, CO 80501

303-651-6417

DATE: 11-8-89

Date: 11-8-89

TO; AOSA Rules committee
Dave Svik, Chairperson

From: Barbara Atkins, RST

Barbara Atkins

Subject: AOSA Rules additions, TABLE 1. Weights for working samples; Flowers

Seed Counts or samples were obtained from the following eight sources:

Seed Testing of America, 950 Boston Ave. Longmont, CO 80501
 Jim Bruce & Students, Front Range Community College, Larimer County Center,
 Fort Collins, CO. ; Marcela Cecil, National Seed Storage Laboratory,
 Fort Collins, CO.
 Betty Atwater; Flower Seed Descriptions, Presented at 16th Congress of
 ISTA, June 1971
 Samen Mauser - Flower seeds, -Seed count per gram
 Lynn Schramel: Harris Moran, 3670 Buffalo Rd., Rochester, NY. 14624
 Paul Baker, Utah State Seed Lab, 350 N. Redwood Rd. Salt Lake City, UT. 84116
 Mary Ann Towbridge, Sun Seeds, Hollister, CA 95024-1438
 Cecelia Warrick, Applewood Seed Co., 5380 Viviar St. Arvada, CO. 80002

Additional references:

Rules for Testing Seeds; Association of Official Seed Analysts, Journal of
 Seed Technology. Volume 6, Number 2, 1981; Revisions from 1984 through 1989

Seed Science and Technology; International Rules for Seed Testing 1985;
 Vol. 13, Number 2, 1985

The weights for the purities have been presented similar to the way ISTA handles the purity weights. The samples coming out below one gram have been present to the nearest tenth of a gram. J. Effeneger was consulted as chairperson of the Uniformity committee and he was in agreement that the weight should be presented in such a manner. These weight do represent 2500 seed count needed for the purity test.

Seed counts were taken from as many sources as possible and where only one source was used, counts were taken from five to ten different samples.

TABLE 1. Weights for working samples: Flowers

	Minimum weight for purity analysis ^a	Minimum weight for noxious weed seed examination	Approximate number of seeds per gram ^b	Approximate number of seeds per ounce ^c
	Grams	Grams	Number	Number
<u>Achillea millefolium</u> L. common yarrow	.4	4	6325	179,314
<u>Anagallis arvensis</u> L. anagallis	2	20	1170	3317
<u>Aquilegia</u> spp. columbine	4	40	600-990 (725)	17,010-28,067 (20,554)
<u>Aster novae-angliae</u> L. New England aster	.9	9	2875	81,506
<u>Baileya multiradiata</u> Torrey wooly-marigold	1	10	2150	60,953
<u>Brachycome iberidifolium</u> Bentham Swan river-daisy	.4	4	5880	166,698
<u>Camissonia cheiranthifolia</u> (Hornemann) Raimann beach evening primrose	.5	5	5445	154,366
<u>Centaurea cyanus</u> L. bachelor's button, cornflower	11	110	225	6379
<u>Clarkia amoena</u> (Lehm.) N&M. godetia	1	10	2570	72,860
<u>Coleus blumei</u> Bentham common coleus	.6	6	2900-5100 (4010)	82,215-144,585 (113,684)
<u>Coreopsis lanceolata</u> L. Coreopsis, perennial	5	50	465	13,183
<u>Corpsis tinctoria</u> Nuttall, calliopsis	.8	8	3130	88,736
<u>Cosmos sulphureus</u> Cavanilles Cosmos; Klondyke types	19	190	135	3827
<u>Dianthus barbatus</u> L. Sweet william	3	30	900	25,515
<u>Digitalis purpurea</u> L. foxglove	.2	2	10,290	291,721
<u>Dimorphotheca sinuata</u> de Candolle African-daisy	5	50	415-800 (530)	11,765-22,680 (15,025)
<u>Echinacea purpurea</u> (L.) Moench purple-coneflower	10	100	255	7229

TABLE 1. Weights for working samples: FLOWERS Continued

	Minimum weight for purity analysis ^a	Minimum weight for noxious weed seed examination	Approximate number of seeds per gram ^b	Approximate number of seeds per ounce ^c
	Grams	Grams	Number	Number
<u>Erysimum X allionii</u> Hortorum wallflower	3	30	765	21,688
<u>Eschscholzia californica</u> Chamisso California-poppy	4	40	500-705 (595)	14,175-19,987 (16868)
<u>Gaillardia aristata</u> Pursh gaillardia, perennial	7	70	345	9781
<u>Gaillardia pulchella</u> Fourgeroux var. <u>picata</u> (Sweet) A. Gray gaillardia, annual	5	50	525	14,884
<u>Gilia tricolor</u> Bentham gilia	1	10	2315	65,630
<u>Gypsophila</u> spp. babys breath	2	20	820-1225 (960)	23,247-34,729 (27,216)
<u>Lavatera trimetris</u> L. herb treemallow	17	170	150	4252
<u>Layia platyglossa</u> (F.&M.) A. Gray tidy tips-daisy	3	30	750	21,262
<u>Liatris</u> spp. gayfeather	8	80	300	8505
<u>Linaria macroccana</u> L. linaria	.2	2	14,730	147,595
<u>Linum grandiflorum</u> Desfontaines cv <u>rubrum</u> L. flowering flax	10	100	290	8222
<u>Linum perenne</u> L. subsp. <u>lewisii</u> perennial flax	4	40	650	18,428
<u>Lobularia maritima</u> Ders. Alyssum	.9	9	2745	77,821
<u>Lupinus subcarnosus</u> Hooker Texas bluebonnet	83	500	30	850
<u>Machaeranthera tanacetifolia</u> (H.B.K.) Nees Tahoka-daisy	3	30	900	25,515
<u>Monarda citriodora</u> Lagasca Lemon mint	1	10	2120	60,102
<u>Nemophila maculata</u> Lindley Nemophila, spotted	15	150	165	4678
<u>Nemophila menziesii</u> Hooker & Arnott Subsp. <u>insignis</u> (Douglas) Brand nemophila, baby blue eyes	5	50	535	15,167

TABLE 1. Weights for working samples: FLOWERS Continued

	Minimum weight for purity analysis ^a	Minimum weight for noxious weed seed examination	Approximate number of seeds per gram ^b	Approximate number of seeds per ounce ^c
<u>Oenothera argillicola</u> Mackenzie evening primrose	Grams 1	Grams 10	Number 2480	Number 70,308
<u>Oenothera macrocarpa</u> Nuttall Ozark sundrops, Missouri primrose	12	120	210	5954
<u>Papaver nudicaule</u> L. Iceland poppy	.4	4	6125	173,644
<u>Papaver rhoeas</u> L. Corn poppy, shirley poppy	.4	4	7340	208,089
<u>Penstemon strictus</u> Bentham Rocky Mountain Penstemon	2	20	1080	30,618
<u>Phacelia campanularia</u> A. Gray Phacelia	2	20	1815	51,455
<u>Phacelia tanacetifolia</u> Bentham Phacelia	5	50	540	15,309
<u>Phlox drummondii</u> Hooker Phlox	5	50	525	14,884
<u>Ratibida columnaris</u> (Nuttall) Wooton & Stadley Mexican Hat, Prairie coneflower	2	20	1625	46,069
<u>Rudbeckia hirta</u> L. Black-eyed Susan	1	10	3200	90,720
<u>Salvia farinacea</u> Bentham Mealycup sage (blue bedder)	3	30	750	21,262
<u>Silene armeria</u> L. sweet william catchfly	.3	3	7535	213,617
<u>Viola cornuta</u> L. Viola	3	30	880	24,948
<u>Viola tricolor</u> L. Pansy	3	30	735	20,837

PROPOSAL

NO. 11

 KIND OF SEED (Scientific and common name):

 PRESENT RULE (If this is a new rule, state "new rule"):

2.3 Weight of working samples

C. In samples that are believed to be unusually small-seeded or large-seeded for the kind being tested.--The size of the purity working sample may be based on a sample containing no less than 2500 seeds without regard to the weight specified in Table 1, provided that in no case shall be less than one-fourth gram be analyzed.

 PROPOSED RULE (Type exactly as it should appear in the rules):

2.3 Weight of working samples

C. In samples that are believed to be unually small-seeded or large-seeded for the kind being tested. -- The size of the purity working sample may be based on a sample containing no less than 2500 seeds without regard to the weight specified in Table 1, provided that in no case shall be less than two-tenths gram (.2) be analyzed

 SUPPORTING EVIDENCE OR REASONS FOR THE PROPOSED RULE (In this space, summarize your reasons for making the proposed change or addition. As supporting evidence, attach 9 copies of summarized research data, literature citations, photocopies of published papers, and any other information helpful to the Rules Committee in making a decision):

If the addition of the flower seeds to Table 1 is adopted, this is a house-keeping item, to bring the weight in line with the lowest purity weight listed for the flower.

 SUBMITTED BY: (Name, address, and phone number)

Barbara Atkins, RST
 Seed Testing of America, 950 Boston Ave. Longmont, CO 80501 303-651-6417

 DATE: 11-8-89

Numbers of seed per gram								ISTA
1.	2.	3.	4.	5.	6.	7.	8.	Purity Weight
6151	-	-	-	-	-	-	6594	.5
<u>Achillea millefolium</u> L. Common yarrow								
1139	-	-	1200	-	-	-	-	2
<u>Anagallis arvensis</u> L. anagallis								
600-990 (750)	-	-	500	616	-	695-950 (793)	1040	4
<u>Aquilegia</u> spp. columbine								
2874	-	-	-	-	-	-	-	-
<u>Aster novae-angliae</u> L. New England aster								
2091	-	-	-	-	-	-	2204	-
<u>Baileya multiradiata</u> Torrey wooly marigold								
6104	6250	-	5280	-	-	-	-	.3
<u>Brachycome iberidifolium</u> Benth Swan river-daisy								
4896	-	-	-	-	-	-	5988	-
<u>Camissonia cheiranthifolia</u> (Hornemann) Raimann beach evening primrose								
206	-	250	213	-	-	-	229	10
<u>Centaurea cyanus</u> L. bachelor's button, cornflower								
2069	-	3000	2990	2222	-	-	-	1
<u>Clarkia amoena</u> (Lehm.) N & M. godetia								
2940-4200 (3675)	-	5146	3200	-	-	-	-	2
<u>Coleus blumei</u> Benth common coleus								
451	-	-	486	-	-	452	-	5
<u>Coreopsis lanceolata</u> L. coreopsis, perennial								
3130	-	-	-	-	-	-	-	1
<u>Coreopsis tinctoria</u> Nuttall calliopsis								
125	-	-	139	-	-	-	-	20
<u>Cosmos sulphureus</u> Cavanilles cosmos, Klondyke types								
936	1069	900	690	-	-	-	-	3
<u>Dianthus barbatus</u> L. sweet william								

	Number of seeds per gram								ISTA Purity Weight
	1.	2.	3.	4.	5.	6.	7.	8.	
<u>Digitalis purpurea</u> L. foxglove	10,291	-	-	9,620	-	-	-	-	.2
<u>Dimorphotheca sinuata</u> de Candolle African-daisy	493 413	799	800	533	-	-	-	416 171	-
<u>Echinacea purpurea</u> (L.) Moench purple-coneflower	243	-	-	-	258	-	-	255	5
<u>Erysimum X allionii</u> Hortorum wallflower	724	-	800	-	-	-	-	765	
<u>Eschscholzia californica</u> chamisso California-poppy	621	500	500	645	-	-	-	705	5
<u>Gaillardia aristata</u> Pursh gaillardia, perennial	366	350	350	336	-	-	-	313	8
<u>Gaillardia pulchella</u> Fourgeroux var. <u>picata</u> (Sweet) A. Gray gaillardia, annual	486	-	500	-	-	-	-	585	-
<u>Gilia tricolor</u> Bentham gilia	2328	2121	-	-	-	-	-	2487	1
<u>Gypsophila</u> spp. babys breath	820-1225 (961)	1405	850	1031	1147	-	-	985-2000 (1465)	2
<u>Lavatera trimetris</u> L. Herb treemallow	154	-	150	-	-	-	-	150	10
<u>Layia platyglossa</u> (F & M) A. Gray tidy tips-daisy	746	-	-	-	-	-	-	748	-
<u>Liatris</u> spp. gayfeather	291	-	300	-	327	-	-	285	8
<u>Linaria ma croccana</u> L. linaria	13,892	15,250	-	15,100	-	-	-	14,676	.2

	Number of seeds per gram								ISTA
	1.	2.	3.	4.	5.	6.	7.	8.	Purity Weight
<u>Linum grandiflorum</u> Desfontanes cv <u>rubrum</u> L. flowering flax	310	-	-	269	-	-	-	389	10
<u>Linum perenne</u> L. subsp. <u>lewsii</u> L. perennial flax, blue	650	-	-	-	-	-	-	-	5
<u>Lobularia maritima</u> Ders. Alyssum	2165	-	-	2800	-	-	-	3271	-
<u>Lupinus subcarinosus</u> Hooker Texas bluebonnet	30	-	-	-	-	-	-	29	-
<u>Machaeranthera tanacetifolia</u> (H.B.K.) Nees Tahoka-daisy	898	-	-	-	-	-	-	-	-
<u>Monarda ci triodora</u> Lagasca Lemon mint	2020	-	-	-	-	-	-	2216	-
<u>Nemophila maculata</u> Lindley Nemphila, spotted	154	-	-	-	-	-	-	173	5
<u>Nemophila menziesii</u> Hooker & Arnott Supsp. <u>insignis</u> (Douglas) Brand nemphila, baby blue eyes	503	-	-	568	-	-	-	-	5
<u>Oenothera argillicola</u> Mackenzie evening primrose	-	2550	-	-	-	-	-	2408	-
<u>Oenothera ma crocarpa</u> Nuttall Ozark drops, Missouri primrose	216	-	200	-	-	-	-	-	10
<u>Papaver nudicaula</u> L. Iceland poppy	6601	4655	-	6120	-	-	-	-	.5
<u>Papaver rhoeas</u> L. Corn poppy, shirley poppy	7496	6880	-	7645	-	-	-	-	.5
<u>Penstemon strictus</u> Bentham Rocky Mountain penstemon	1028	-	-	-	-	-	-	1124	-
<u>Phacelia campanularia</u> A. Gray Phacelia	1783	-	-	1883	-	-	-	1782	2

	Number of seeds per gram								ISTA Purity Weight
	1.	2.	3.	4.	5.	6.	7.	8.	
<u>Phalcelia tanacetifolia</u> Bentham Phacelia	510	-	-	-	-	-	-	564	-
<u>Phlox drummondii</u> Hooker Phlox	473	540	500	616	525	-	-	485	5
<u>Ratibida columnaris</u> (Nuttall) Wooton & Stadley Mexican hat, prairie coneflower	1761	1621	-	-	1579	-	-	1526	-
<u>Rudbeckia hirta</u> L. Black-eyed Susan	3475	3717	2000	3700	-	-	-	3094	1
<u>Salvia farinacea</u> Benthem Mealycup sage (blue bedder)	685	-	800	-	-	-	-	766	5
<u>Silene armeria</u> L. sweet william catchfly	7483	-	-	-	-	-	-	7590	-
<u>Viola cornuta</u> L. Viola	-	870	850	881	-	-	-	920	3
<u>Viola tricolor</u> L. pansy	-	687	750	764	-	-	-	-	3

PROPOSAL NO. 12

KIND OF SEED (Scientific and common name):

Festuca spp., fescue, (excluding Festuca rubra subsp. rubra, red, creeping red fescue, and Festuca rubra subsp. commutata, chewings fescue), and Lolium spp., ryegrass.

PRESENT RULE

2.6 b. (2) Multiple florets and spikelets in tall oatgrass (Arrhenatherum elatius), oat (Avena spp.), grammas (Bouteloua spp.), rhodesgrass (Chloris gayana), barley (Hordeum vulgare), and bluegrass (Poa spp.);

PROPOSED RULE

2.6 b. (2) (a) Florets of fescue, Festuca spp. (excluding red, creeping red fescue, Festuca rubra subsp. rubra, and chewings fescue, Festuca rubra subsp. commutata), and ryegrass, Lolium spp., which have an attached sterile or fertile floret, provided the attached floret does not extend to or beyond the tip of the fertile floret. The length of an awn shall be disregarded when determining the length of an attached structure. An attached floret as described above shall not be removed.

2.6 b. (2) (b) Multiple florets and spikelets in tall oatgrass (Arrhenatherum elatius), oat (Avena spp.), grammas (Bouteloua spp.), rhodesgrass (Chloris gayana), barley (Hordeum vulgare), and bluegrass (Poa spp.);

SUPPORTING EVIDENCE OR REASONS FOR THE PROPOSED RULE:

See attachment:

Jim Effenberger, 1220 N Street, Sacramento, CA (916) 445-4521
uniformity subcommittee

The AOSA rules consider only single florets and caryopses of Festuca spp. (excluding Festuca rubra subsp. rubra, and Festuca rubra subsp. commutata), and Lolium spp. to be the seed unit. This ruling requires the removal of attached sterile and fertile florets, which creates conflict within the rules. Rule 2.6 states that seed units are the structures usually regarded as a seed in planting practices and in commercial channels, and it is apparent that multiple units of Festuca spp. (excluding Festuca rubra subsp. rubra, and Festuca rubra subsp. commutata), and Lolium spp. are the units being sold and planted. Obviously, farmers are not separating these units before they plant them. By separating the multiple florets, we are physically changing the product which is in disagreement with the philosophy of the rules.

A modified method for the testing of Festuca spp. (excluding Festuca rubra subsp. rubra, and Festuca rubra subsp. commutata), and Lolium spp. has not been found by either AOSA or ISTA. The International Seed Testing Purity Committee working on multiple florets in grasses concluded that the seed unit in Lolium spp. consists of a fertile floret with or without attached sterile floret, provided that the sterile floret does not extend to the tip of the fertile floret, and that multiple seed units of Festuca spp. are left intact and included in the pure seed fraction. Survey results of germination tests of seed lots comparing multiple florets with single florets on these two genera showed no change in normal seedling percentages, and only a small increase in the over-all pure seed percentage.

The new rule proposal will provide consistency within the A.O.S.A. rules, promote uniformity, and eliminate the time consuming job of removing the attached florets.

PROPOSAL NO. 13

Change of minimum working weights for noxious-weed seed examinations of 27 species listed in Table 1.

KIND OF SEED

Allium cepa, onion; Allium porrum, leek; Anethum graveolens, dill; Apium graveolens var. dulce and var. rapaceum, celery and celeriac; Barbarea verna, upland cress; Beta vulgaris subsp. vulgaris and subsp. cicla, beet and Swiss chard; Brassica oleracea var. acephala, collards and kale; Brassica oleracea var. botrytis, broccoli and cauliflower; Brassica oleracea var. capitata, cabbage; Brassica oleracea var. gemmifera, brussels-sprouts; Brassica oleracea var. gongylodes, kohlrabi; Cichorium endivia, endive; Cichorium intybus, chicory; Daucus carota subsp. sativus, carrot; Lactuca sativa, lettuce; Nasturtium officinale, watercress; Physalis pubescens, husk-tomato; Rheum rhabarbarum, rhubarb; Rumex acetosa, sorrel; Salvia officinalis, sage; Satureja hortensis, summer savory; Solanum melongena, eggplant; Spinacia oleracea, spinach; Taraxacum officinale, dandelion; Tragopogon porrifolius, salsify; Valerianella locusta, cornsalad (all other cvs.)

PRESENT RULE:

2.3 Weight of working samples

- a. Kinds of seed listed in Table 1. - The weight of the working samples for the purity analysis and noxious-weed seed examination shall not be less than that prescribed in Table 1, except as noted in c below. When a purity analysis is performed on a sample, the weight of the sample used for purity analysis may be considered part of the minimum weight specified for the noxious-weed seed examination.

2.4, Table 1. Weights for working sample of agricultural, vegetable and herb, and tree and shrub seeds

Kind of seed	Minimum weight for purity analysis ^a	Minimum weight for noxious-weed seed examination	Approximate number of seeds per gram ^b	Approximate number of seeds per ounce ^c
	Grams	Grams	Number	Number
VEGETABLE AND HERB SEEDS				
<i>Allium cepa</i> L. onion	7	50	340	9,665
<i>Allium porrum</i> L. leek	7	50	395	11,225
<i>Anethum graveolens</i> L. dill	3	50	800	22,720
<i>Apium graveolens</i> L. var. <i>dulce</i> (Miller) Persoon and var. <i>rapaceum</i> (Miller) Gaudin celery and celeriac	1	25	2,500	71,470
<i>Barbarea verna</i> (Miller) Ascherson upland cress	2	35	1,160	32,885

2.4, Table 1. Weights for working sample of agricultural, vegetable and herb, and tree and shrub seeds

Kind of seed	Minimum weight for purity analysis ^a	Minimum weight for noxious-weed seed examination	Approximate number of seeds per gram ^b	Approximate number of seeds per ounce ^c
VEGETABLE AND HERB SEEDS				
	Grams	Grams	Number	Number
<i>Allium cepa</i> L. onion	7	70	340	9,665
<i>Allium porrum</i> L. leek	7	70	395	11,225
<i>Anethum graveolens</i> L. dill	3	30	800	22,720
<i>Apium graveolens</i> L. var. <i>dulce</i> (Miller) Persoon and var. <i>rapaceum</i> (Miller) Gaudin celery and celeriac	1	10	2,500	71,470
<i>Barbarea verna</i> (Miller) Ascherson upland cress	2	20	1,160	32,885
<i>Beta vulgaris</i> L. subsp. <i>vulgaris</i> beet and Swiss chard (subsp. <i>cicla</i> (L.) Koch)	50	500	60	1,645
<i>Brassica oleracea</i> L. var. <i>acephala</i> DC. collards and kale	10	100	315	8,930
<i>Brassica oleracea</i> L. var. <i>alboglabra</i> (Bailey) Musil Chinese kale	10	100		
<i>Brassica oleracea</i> L. var. <i>botrytis</i> L. broccoli and cauliflower	10	100	315	8,930
<i>Brassica oleracea</i> L. var. <i>capitata</i> L. cabbage	10	100	315	8,930
<i>Brassica oleracea</i> L. var. <i>gemmifera</i> DC. brussels-sprouts	10	100	315	8,930
<i>Brassica oleracea</i> L. var. <i>gongylodes</i> L. kohlrabi	10	100	315	8,930
<i>Cichorium endivia</i> L. endive	3	30	940	26,650
<i>Cichorium intybus</i> L. chicory	3	30	940	26,650
<i>Daucus carota</i> L. subsp. <i>sativus</i> (Hoffmann) Arcangeli carrot	3	30	825	23,415
<i>Lactuca sativa</i> L. lettuce	3	30	890	25,175
<i>Nasturtium officinale</i> R. Brown watercress	1	10	5,170	146,625
<i>Physalis pubescens</i> L. husk-tomato	2	20	1,240	35,155
<i>Rheum rhabarbarum</i> L. rhubarb	50	500	60	1,700
<i>Rumex acetosa</i> L. sorrel	2	20	1,080	30,590
<i>Salvia officinalis</i> L. sage	25	250	120	3,435
<i>Satureja hortensis</i> L. summer savory	2	20	1,750	49,700
<i>Solanum melongena</i> L. eggplant	10	100	230	6,465
<i>Spinacia oleracea</i> L. spinach	25	250	100	2,835
<i>Taraxacum officinale</i> Wiggers dandelion	2	20	1,240	35,155
<i>Tragopogon porrifolius</i> L. salsify	50	500	65	1,870
<i>Valerianella locusta</i> (L.) Laterrade cornsalad (full hearted cvs.) (all other cvs.)	10	100	380	10,775

<i>Beta vulgaris</i> L. subsp. <i>vulgaris</i> beet and Swiss chard (subsp. <i>cicla</i> (L.) Koch)	50	300	60	1,645
<i>Brassica oleracea</i> L. var. <i>acephala</i> DC. collards and kale	10	50	315	8,930
<i>Brassica oleracea</i> L. var. <i>alboglabra</i> (Bailey) Musil Chinese kale	10	50		
<i>Brassica oleracea</i> L. var. <i>botrytis</i> L. broccoli and cauliflower	10	50	315	8,930
<i>Brassica oleracea</i> L. var. <i>capitata</i> L. cabbage	10	50	315	8,930
<i>Brassica oleracea</i> L. var. <i>gemmifera</i> DC. brussels-sprouts	10	50	315	8,930
<i>Brassica oleracea</i> L. var. <i>gongylodes</i> L. kohlrabi	10	50	315	8,930
<i>Cichorium endivia</i> L. endive	3	50	940	26,650
<i>Cichorium intybus</i> L. chicory	3	50	940	26,650
<i>Daucus carota</i> L. subsp. <i>sativus</i> (Hoffmann) Arcangeli carrot	3	50	825	23,415
<i>Lactuca sativa</i> L. lettuce	3	50	890	25,175
<i>Nasturtium officinale</i> R. Brown watercress	1	25	5,170	146,625
<i>Physalis pubescens</i> L. husk-tomato	2	35	1,240	35,155
<i>Rheum rhabarbarum</i> L. rhubarb	50	300	60	1,700
<i>Rumex acetosa</i> L. sorrel	2	35	1,080	30,590
<i>Salvia officinalis</i> L. sage	25	150	120	3,435
<i>Satureja hortensis</i> L. summer savory	2	35	1,750	49,700
<i>Solanum melongena</i> L. eggplant	10	50	230	6,465
<i>Spinacia oleracea</i> L. spinach	25	150	100	2,835
<i>Taraxacum officinale</i> Wiggers dandelion	2	35	1,240	35,155
<i>Tragopogon porrifolius</i> L. salsify	50	300	65	1,870
<i>Valerianella locusta</i> (L.) Laterrade cornsalad (full hearted cvs.) (all other cvs.)	10	50	380	10,775

PROPOSED RULE:

2.3 Weight of working samples

- a. Kinds of seed listed in Table 1. - The weight of the working samples for the purity analysis and noxious-weed seed examination shall not be less than that prescribed in Table 1, except as noted in c below. The working sample weight for a noxious-weed seed examination is equal to ten times the amount of a purity working weight, subject to a maximum of 500 grams. When a purity analysis is performed on a sample, the weight of the sample used for purity analysis may be considered part of the minimum weight specified for the noxious-weed seed examination.

SUPPORTING EVIDENCE

Table 1 lists 276 species under the agricultural and vegetable and herb sections. The noxious-weed seed examination working weights are ten times the amount of the purity weights, subject to a maximum of 500 grams, with the exception of 27 species currently appearing in the vegetable and herb section. Weights for noxious-weed seed examinations for 15 species are less than and for 12 species are greater than ten times the purity amount. Adjustment of the noxious-weed seed working weights of these 27 species will demonstrate uniformity within the Rules for Testing Seed and will establish a uniform method for deriving the working weight of a noxious-weed seed examination for species that may be added to Table 1.

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DATE: November 13, 1989

PROPOSAL NO. 14

Addition of Chrysothamnus nauseosus-Rubber Rabbitbrush to the Rules.

PROPOSED RULE

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

Kind of Seed	Min. Wt. for Purity Anal. (g)	Approx. No. Seeds/Gram	Approx. No. Seeds/Oz.
<u>Chrysothamnus nauseosus</u> rubber rabbitbrush	2	1350	38,200

2) Include the Table 5 (Methods of testing for laboratory germination (TREE and SHRUB SEEDS) the following:

Kind of Seed	Substrata	Temp.-C	Dur.	Add. Dir.
<u>Chrysothamnus nauseosus</u> rubber rabbitbrush	P	25,20-30	28	

SUPPORTING EVIDENCE OR REASONS FOR THE PROPOSED RULE.

1) Seed weights are based on filled fruits of 16 samples belonging to subspecies commonly encountered in commerce. The pappus may or may not be removed in cleaning; if attached it was considered part of the seed unit. Seed weights in this species are variable. The values here are in rough agreement with values reported elsewhere (Deutschman et al 1974, Belcher 1985).

2) In a referee purity analysis, laboratories were asked to include only filled fruits as pure seed. Purity percentages were in close agreement (mean 43.8, S.E. 0.6, range 41.7-46.1, n=8). These results suggest that a pure seed criterion similar to that used for weed seed (2.10b (4)) would work well for this species, which is often sold at low purity. Results of purity analyses on 6 commercial lots indicated that decisions regarding inclusion or exclusion of unfilled fruits had no major effect on pure live seed values (mean 15.0% versus 18.8% respectively). We recommend following the present rule for purity rather than proposing a global change in purity analysis procedures for Asteraceae or a specific exception for rubber rabbitbrush.

3) Results of extensive germination experiments with over 60 collections of native rubber rabbitbrush seed indicate that dormancy at temperatures above 20C is rare (Meyer and McArthur 1987). Germination of most lots likely to be encountered in commerce is complete within 14 days at 25C, but some high elevation lots may require up to 28 days. Dormancy at intermediate temperatures (i.e. 15C) is common in middle and high elevation collections; therefore relatively high temperature regimes are recommended (Meyer, McArthur, and Jorgensen in review). Lack of dormancy at high temperature has been reported by other workers (Sabo et al 1979, Belcher 1985, Romo and Eddleman 1988).

4) A germination referee using the proposed rule gave variable results (total viable seed percentage mean 63.8, S.E. 5.3, range 36.0-79.2, n=7). This may have been due to the large number of broken seeds in the sample, resulting in variable classification of abnormal seedlings.

LITERATURE CITED

- Belcher, E. (ed.) 1985. Handbook on seeds of browse-shrubs and forbs. USDA Forest Service Tech. Pub. R8-TP8.
- Deitschman, G.H., K.R. Jorgensen, and A.P. Plummer, 1974. Chrysothamnus. P.326-328. In: Schopmeyer, C.S. (ed.) Seeds of woody plants in the United States. USDA Handbook 450.
- Meyer, S.E., and E.D. McArthur. 1987. Studies on the seed germination biology of rubber rabbitbrush. P. 19-25. In: K.L. Johnson (ed.). Proc. Fourth Utah Shrub Ecology Workshop. The Genus Chrysothamnus. Utah State University, Logan, Utah.
- Meyer, S., E. D. McArthur, and G. L. Jorgensen. 1989. Variation in germination response to temperature in rubber rabbitbrush (Chrysothamnus nauseosus, Asteraceae) and its ecological significance. Amer. J. Bot. 76: 981-991.
- Romo, J.T., and L.E. Eddleman. 1988. Germination of green and gray rubber rabbitbrush and their establishment on coal mined land. J. Range Manage. 41:491-495.
- Sabo, D.G., G.V. Johnson, W.C. Martin, and E.F. Aldon. 1979. Germination of 19 species of arid land plants. USDA Forest Service Res. Pap. RM-210.

SUBMITTED BY

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Supporting Evidence for the Proposed Rule
Chrysothamnus nauseosus
Rubber Rabbitbrush

Submitted by Susan E. Meyer, G. Richard Wilson, and Richard Stevens

Introduction

Rubber rabbitbrush is used extensively in artificial reseeding of depleted wildlife ranges and in mineland reclamation (Monsen and Stevens, 1987; Rolos and Eddleman, 1988). It is an important species in the commercial wildland seed marketplace.

Seed Weights

Seed weights were obtained by selecting 500 apparently filled seeds from each of 16 lots. Depending on the cleaning technique, pappus was either present or absent. If the pappus was attached it was considered part of the seed unit. Seed weight within this species as a whole varies over an eightfold range (Meyer, unpublished data). The samples chosen for the calculation were of subspecies commonly encountered in the marketplace. Mean number of seeds/gram was 1345, giving a mean weight for 2500 seeds of 1.86 grams (Table 1). These values are in approximate agreement with previous reports (Deitschman et al., 1974; Belcher, 1985).

Purity Analysis

A problem in rubber rabbitbrush purity is classification of apparently unfilled fruits. Commercial lots are normally of low purity (15-40%) and contain a large fraction of unfilled fruits. The job of the analyst would be made simpler if visible unfilled fruits could be excluded from pure seed based on 2.10b(4) of the present Rules, which states that immature fruits of weeds devoid of both embryo and endosperm are considered inert material. An amendment of this nature was proposed at the 1989 AOSA meeting and apparently caused the failure of the entire proposal.

In order to find out how much difference classification of unfilled fruits would make to pure live seed (PLS) percentages, we performed purity analyses on six commercial lots using two criteria, unfilled fruits considered either as pure seed or as inert material (Table 2). PLS values were calculated based on an assumed germination of 0% for unfilled fruits and 100% for filled fruits. This should maximize the differences obtainable by using the two criteria. When unfilled fruits were included as pure seed, purity increased an average of 7.6%, germination decreased an average of 45.3%, and PLS decreased an average of 3.8%. This suggests that if a rule change is someday made to exclude unfilled fruits from pure seed in this species, the effect on PLS will be minimal. This sort of a rule change would increase germination percentages and decrease variance in the germination test.

In a referee purity analysis where analysts were asked to include only filled fruits as pure seed, laboratories obtained values in close agreement (Table 3).

Laboratory Germination

In the past three years, our group has worked extensively on between-population variation in rubber rabbitbrush germination responses, particularly to temperature. Two papers are appended which contain detailed information on response to temperature and on germination rate (Meyer and McArthur, 1987; Meyer et al., 1989).

Results of a referee on laboratory germination using the proposed rule are found in Table 3. The sample sent for the referee had an unusually high fraction of broken seed which apparently confused the results. One laboratory probably received a sample which had lost viability due to some accident in transit. But even discounting the results of this laboratory, considerable variation was seen. One laboratory reported 33% dormant seed, a very unusual result for this species. Varying numbers of seedlings, probably from broken seed, were classified as abnormal. These broken seeds may have been considered inert by other laboratories. Even though the referee germination test did not produce reliably repeatable results, the fault probably lies in the sample sent rather than in the germination procedure recommended.

Literature Cited

- Belcher, E. (ed.). 1985. Handbook on seeds of browse-shrubs and fors. USDA Forest Service Tech. Report R8-TP8.
- Deitschman, G. H., K. R. Jorgensen, and A. P. Plummer. 1974. Chrysothamnus. p. 326-328. In: Schopmeyer, C. S. (ed.). Seeds of woody plants in the United States. USDA Handbook 450.
- Meyer, S. E., and E. D. McArthur. 1987. Studies on the seed germination biology of rubber rabbitbrush. p. 19-25. In: K. L. Johnson (ed.). Proc. fourth Utah shrub ecology workshop. The genus Chrysothamnus. Utah State Univ., Logan, Utah.
- Meyer, S. E., E. D. McArthur, and G. L. Jorgensen. 1989. Variation in germination response to temperature in rubber rabbitbrush (Chrysothamnus nauseosus: Asteraceae) and its ecological implications. Amer. J. Bot. 76: 981-991.
- Monsen, S. B., and R. L. Stevens. 1987. Seed and seeding characteristics of rabbitbrush. p. 41-50. In: K. L. Johnson (ed.). Proc. fourth Utah shrub ecology workshop. The genus Chrysothamnus. Utah State Univ., Logan, Utah.
- Romo, J. T., and L. E. Eddleman. 1988. Germination of green and gray rubber rabbitbrush and their establishment on coal mined lands. J. Range Manage. 41: 491-495.

Table 1. Seed weights for rubber rabbitbrush.

Collection	Year	Subspecies	Seeds/gram
Utah Lake UT	1986	hololeucus	851
Fruitland UT	1986	hololeucus	1333
Nephi Cyn. UT	1986	hololeucus	894
Leeds UT	1986	hololeucus	1136
Jericho Dunes UT	1986	hololeucus	1389
Mayfield UT	1986	hololeucus	1316
Hailstone Jct. UT	1986	albicaulis	1250
Leeds UT	1985	graveolens	1754
Paragonah UT	1985	graveolens	1468
Huntington Cyn. UT	1985	graveolens	740
Castle Creek UT	1985	graveolens	1400
Monument Valley UT	1985	graveolens	1136
Salina Cyn. UT	1985	graveolens	1147
Mayfield UT	1985	consimilis	2041
Birdseye UT	1985	consimilis	1295
Moore UT	1985	consimilis	1970
Mean			1345
Std. Error			79

38,160 seeds/ounce

610,630 seeds/pound

Table 2. Results of purity analyses on 6 commercial rubber rabbitbrush seedlots using 2 criteria, fruits which are visibly unfilled considered as inert material or considered as pure seed. Effects on pure live seed calculated on the basis of 100% viability of filled fruits and 0% viability of unfilled fruits.

Seedlot	Purity		Viability		PLS	
	Unfilled Fruits as Inert	Fruits as Seed	Unfilled Fruits as Inert	Fruits as Seed	Unfilled Fruits as Inert	Fruits as Seed
U1-85	22.5	28.1	100	63	22.5	17.7
U17-85	10.6	21.6	100	37	10.6	8.0
U100-85	17.9	26.7	100	49	17.9	13.1
U100-84	14.9	22.1	100	38	14.9	8.4
U99-84	9.9	17.5	100	65	9.9	11.4
NPI-84	37.3	42.5	100	74	37.3	31.5
Mean	18.8	26.4	100	54.3	18.8	15.0

Table 3. Results of rubber rabbitbrush referee purity analysis and germination test using the proposed rule.

Lab	% Germ	% Dorm	% Viable	% Abnorm	% TV+Abn	% Purity
1	3.0*	0*	3.0*	7.0*	10.0*	44.48
2	60.8	.2	61.0	1.8	62.8	44.63
3	62.2	7.8	70.0	4.2	74.2	41.70
4	36.0	0	36.0	21.0	57.0	45.38
5	46.2	33.0	79.2	3.0	82.2	42.00
6	59.2	0	59.2	13.2	72.5	46.06
7	66.2	2.2	68.5	7.0	75.5	43.99
8	72.0	1.0	73.0	1.0	74.0	42.43
Mean	57.5	6.3	63.8	7.3	71.2	43.84
S.E.	4.7	4.6	5.3	2.8	3.2	0.57

* Not included in means.

PROPOSAL
NO. 15

KIND OF SEED:

Sorghum bicolor x Sorghum x drummondii, sorghum-sudangrass

PRESENT RULE:

New Rule

PROPOSED RULE:

1) Include in Table 1 (Weights for working samples, Agricultural Seeds) the following:

<u>Kind of seed</u>	<u>Min. wt. for purity anal. (g)</u>	<u>Min. wt. for noxious-weed seed exam. (g)</u>	<u>Approx. no. seeds/gram</u>	<u>Approx. no. seeds/oz.</u>
<u>Sorghum bicolor</u> Moench x <u>Sorghum</u> x <u>drummondii</u> (Steudel) Millsp. and Chase sorghum-sudangrass	50	500	55	1559

2) Include in Table 3 (Methods of testing for laboratory germination, Agricultural Seeds) the following:

<u>Kind of seed</u>	<u>Substrata</u>	<u>°C Temp.</u>	<u>First count days</u>	<u>Final count days</u>	<u>Spec. requir. and photo. #</u>	<u>Fresh and dormant seed</u>
<u>Sorghum bicolor</u> x <u>Sorghum</u> x <u>drummondii</u> sorghum-sudangrass	B,T,S	20-30	4	10		Prechill at 5° or 10°C for 5 days.

SUPPORTING EVIDENCE OR REASONS FOR THE PROPOSED RULE:

Sorghum bicolor x Sorghum x drummondii, sorghum-sudangrass, was added to the Federal Seed Act on July 1, 1963 (1). This followed the publication of the proposal in the Federal Register on January 22, 1963 (2), public hearings on February 25, 1963, and the consideration of written comments.

The seed unit includes caryopses and single florets as well as entire spikelets which may have attached rachis segments, pedicels, and sterile spikelets. The approximate number of seeds/ounce, not given in the Federal Seed Act, was calculated by multiplying the value of 55 seeds/gram by the factor of 28.35 grams/ounce.

The scientific name given for sorghum-sudangrass in the latest revision of the Federal Seed Act (October 1987) is Sorghum bicolor x Sorghum sudanense. The currently acceptable nomenclature is Sorghum bicolor x Sorghum x drummondii (3). Sorghum-sudangrass is found in the rules for testing seeds of the International Seed Testing Association (4). Sorghum-sudangrass is also listed in the Uniform Classification of Weed and Crop Seeds (5) and given a "1" classification, meaning seeds of this kind are to be regarded as crop seeds in all samples when occurring in any amounts.

Literature Cited:

(1) 28 FR 5361

(2) 28 FR 558

(3) Terrell, E., S.R. Hill, J. H. Wiersema, and W. E. Rice. 1986. A checklist of names for 3,000 vascular plants of economic importance. USDA, Agric. Handbook No. 505, 244 pp.

(4) International Seed Testing Association. 1985. International rules for seed testing. Seed Sci. and Tech. 13(2). Revised 1987. 520 pp.

(5) Association of Official Seed Analysts. 1952. Uniform classification of weed and crop seeds. Contribution No. 25 to the Handbook on Seed Testing. Revised 1977. 36pp.

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DATE: 11/13/89

PROPOSAL
NO. 16

KIND OF SEED:

Trifolium vesiculosum, arrowleaf clover

PRESENT RULE:

New Rule

PROPOSED RULE:

1) Include in Table 1 (Weights for working samples, Agricultural Seeds) the following:

<u>Kind of seed</u>	<u>Min. wt. for purity anal. (g)</u>	<u>Min. wt. for noxious-weed seed exam. (g)</u>	<u>Approx. no. seeds/gram</u>	<u>Approx. no. seeds/oz.</u>
<u>Trifolium vesiculosum</u> Savi, arrowleaf clover	3	30		

2) Include in Table 3 (Methods of testing for laboratory germination, Agricultural Seeds) the following:

<u>Kind of seed</u>	<u>Substrata</u>	<u>°C Temp.</u>	<u>First count days</u>	<u>Final count days</u>	<u>Spec. requir. and photo. #</u>	<u>Fresh and dormant seed</u>
<u>Trifolium vesiculosum</u> arrowleaf clover	B,T	20	4	14a	See sec. 4.9-C.	

SUPPORTING EVIDENCE OR REASONS FOR THE PROPOSED RULE:

Trifolium vesiculosum, arrowleaf clover, was added to the Federal Seed Act on July 1, 1976 (1). The proposal was originally published in the Federal Register on September 3, 1975 (2). Public hearings were held on October 7, 1975 and written comments were requested concerning the proposal.

The seed unit is a true seed. The seed weight given in the original proposal (1) and in a subsequent revision of the Federal Seed Act, is 90 seeds/gram. Since this figure is obviously in error, no values for seeds/gram or seeds/ounce are given with this proposal.

Arrowleaf clover is a kind included in the rules for testing seeds of the International Seed Testing Association (3). Arrowleaf clover is found in the Uniform Classification of Weed And Crop Seeds (4) and is given a "1" classification, meaning seeds of this kind are to be regarded as crop seeds in all samples when occurring in any amounts.

Literature Cited:

(1) 41 FR 20155

(2) 40 FR 40524

(3) International Seed Testing Association. 1985. International rules for seed testing. Seed Sci. and Tech. 13(2). Revised 1987. 520 pp.

(4) Association of Official Seed Analysts. 1952. Uniform classification of weed and crop seeds. Contribution No. 25 to the Handbook on Seed Testing. Revised 1977. 36pp.

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DATE: 11/13/89

PROPOSAL

NO. 17

KIND OF SEED:Triticum x Agrotriticum, wheat x agrotriticum

PRESENT RULE:

New Rule

PROPOSED RULE:

1) Include in Table 1 (Weights for working samples, Agricultural Seeds) the following:

<u>Kind of seed</u>	<u>Min. wt. for purity anal. (g)</u>	<u>Min. wt. for noxious-weed seed exam. (g)</u>	<u>Approx. no. seeds/gram</u>	<u>Approx. no. seeds/oz.</u>
<u>Triticum</u> L. x <u>Agrotriticum</u> Ciferri and Giacom wheat x agrotriticum	65	500	38	1077

2) Include in Table 3 (Methods of testing for laboratory germination, Agricultural Seeds) the following:

<u>Kind of seed</u>	<u>Substrata</u>	<u>°C Temp.</u>	<u>First count days</u>	<u>Final count days</u>	<u>Spec. requir. and photo. #</u>	<u>Fresh and dormant seed</u>
<u>Triticum</u> x <u>Agrotriticum</u> wheat x agrotriticum	B,T,S	20;15	4	7		Prechill at 5° or 10° for 5 days.

SUPPORTING EVIDENCE OR REASONS FOR THE PROPOSED RULE:

Triticum x Agrotriticum, wheat x agrotriticum was added to the Federal Seed Act on July 1, 1976 (1). The proposal was published in the Federal Register (2) on September 3, 1975, written comments were requested and a public hearing was held on October 7, 1975.

The seed unit is a caryopsis or a single floret. The approximate number of seeds/ounce, not given in the Federal Seed Act, was calculated by multiplying the approximate number of seeds/gram by the factor of 28.35 grams/ounce.

This kind was added to the Uniform Classification of Weed and Crop Seeds (3) in a revision in 1977. Wheat x agroticum is given a "1" classification, meaning seeds of this kind are to be regarded as crop seeds in all samples when occurring in any amounts.

Literature Cited:

(1) 41 FR 20155

(2) 40 FR 40524

(3) Association of Official Seed Analysts. 1952. Uniform classification of weed and crop seeds. Contribution No. 25 to the Handbook on Seed Testing. Revised 1977. 36 pp.

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PROPOSAL

NO. 18

KIND OF SEED:Bromus biebersteinii, meadow brome

PRESENT RULE:

New Rule

PROPOSED RULE:

1) Include in Table 1 (Weights for working samples, Agricultural Seeds) the following:

<u>Kind of seed</u>	<u>Min. wt. for purity anal. (g)</u>	<u>Min. wt. for noxious-weed seed exam. (g)</u>	<u>Approx. no. seeds/gram</u>	<u>Approx. no. seeds/oz.</u>
<u>Bromus</u> <u>biebersteinii</u> Roem. and Schult., meadow brome	13	130	190	5387

2) Include in Table 3 (Methods of testing for laboratory germination, Agricultural Seeds) the following:

<u>Kind of seed</u>	<u>Substrata</u>	<u>°C Temp.</u>	<u>First count days</u>	<u>Final count days</u>	<u>Spec. requir. and photo. #</u>	<u>Fresh and dormant seed</u>
<u>Bromus</u> <u>biebersteinii</u> meadow brome	B,T,TB	20-30	6	14	light optional	

SUPPORTING EVIDENCE OR REASONS FOR THE PROPOSED RULE:

Bromus biebersteinii, meadow brome, was added to the Federal Seed Act on July 1, 1976 (1). This followed publication of the proposal in the Federal Register on September 3, 1975 (2), public hearings on October 7, 1975, and a review of written comments on the proposal.

The seed unit is a caryopsis or a single floret. The seed weight given in the original proposal (1) and as printed in subsequent revisions of the Federal Seed Act is 19 seeds/gram. This value is obviously an error. Data compiled by the USDA, ARS, Crops Research Division, Fort Collins, Colorado, dated January 23, 1970, indicates that meadow brome has 189 seeds/gram. Copies of this data are included with this rule proposal. Using the value of 190 seeds/gram will give approximately 2,500 seed units in the minimum weight of 13 grams for the purity analysis. The approximate number of seeds/ounce was calculated by multiplying the value of 190 seeds/gram by the factor of 28.35 grams/ounce.

Meadow brome is included in the Uniform Classification of Weed and Crop Seeds (3) and is given a "1" classification, meaning seeds of this kind are to be regarded as crop seeds in all samples in any amounts.

Literature Cited:

(1) 41 FR 20155

(2) 40 FR 40524

(3) Association of Official Seed Analysts. 1952. Uniform classification of weed and crop seeds. Contribution No. 25 to the Handbook on Seed Testing. Revised 1977. 36 pp.

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DATE: 11/13/89

SEED COUNTS--GRASSES

Page 3

Kind of Seed	No. of samples weighed	No. per grams	No. per ounces
Bluestem species unknown:			
Gordo bluestem	3	891	25,259
<u>Arrhonatherum elatius</u> Tall oatgrass	4	417	11,822
<u>Axonopus affinis</u> Carpetgrass	5	2,232	63,276
<u>Bouteloua curtipendula</u> Sideoats grama	54	351	9,950
<u>Bouteloua gracilis</u> Blue grama	57	1,597	45,274
<u>Bromus arvensis</u> Field brome	14	466	13,211
<u>Bromus catharticus</u> Rescuegrass	13	114	3,232
<u>Bromus inermis</u> Smooth brome (no var.)	29	325	9,214
" " var. Lincoln	40	331	9,384
" " var. Manchar	16	299	8,477
Miscellaneous <u>bromes</u> species not known:			
Southern	3	329	9,327
Saratoga	10	294	8,335
Canadian brome	7	275	7,796
Meadow brome	5	189	5,358
Red brome	3	222	6,294
<u>Buchloe dactyloides</u> <u>Buphalograss</u> var. (Burs)	20	110	3,118
<u>Cynodon dactylon</u> Common bermudagrass	11	3,497	99,138
" " (hulled)	21	4,566	129,444
<u>Cynodon spp.</u> Giant bermudagrass	10	2,950	83,631

PROPOSAL

NO. 19

KIND OF SEED:X Agrotriticum, agrotriticum

PRESENT RULE:

New Rule

PROPOSED RULE:

1) Include in Table 1 (Weights for working samples, Agricultural Seeds) the following:

<u>Kind of seed</u>	<u>Min. wt. for purity anal. (g)</u>	<u>Min. wt. for noxious-weed seed exam. (g)</u>	<u>Approx. no. seeds/gram</u>	<u>Approx. no. seeds/oz.</u>
X <u>Agrotriticum</u> Ciferri and Giacom agrotriticum	65	500	39	1106

2) Include in Table 3 (Methods of testing for laboratory germination, Agricultural Seeds) the following:

<u>Kind of seed</u>	<u>Substrata</u>	<u>°C Temp.</u>	<u>First count days</u>	<u>Final count days</u>	<u>Spec. requir. and photo. #</u>	<u>Fresh and dormant seed</u>
X <u>Agrotriticum</u> agrotriticum	B,T,S	20;15	4	7		Prechill 5° or 10°C. for 5 days

SUPPORTING EVIDENCE OR REASONS FOR THE PROPOSED RULE:

X Agrotriticum, agrotriticum, was added to the Federal Seed Act on July 1, 1976 (1). The proposal was published in the Federal Register (2) on September 3, 1975. A public hearing was held on October 7, 1975, and written comments were requested concerning the proposal.

The seed unit is a caryopsis or a single floret. The approximate number of seeds/ounce, not given in the Federal Seed Act, was calculated by multiplying the approximate number of seeds/gram by the factor of 28.35 grams/ounces.

Agrotricum was added to the Uniform Classification of Weed and Crop Seeds (3) in a revision in 1977. Agrotricum is given a "1" classification, meaning seeds of this kind are to be regarded as crop seeds in all samples when occurring in any amounts.

Literature Cited:

(1) 41 FR 20155

(2) 40 FR 40524

(3) Association of Official Seed Analysts. 1952. Uniform classification of weed and crop seeds. Contribution No. 25 to the Handbook on Seed Testing. Revised 1977. 36 pp.

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PROPOSAL

NO. 20

KIND OF SEED:Allium fistulosum, Welsh onion

PRESENT RULE:

New Rule

PROPOSED RULE:

1) Include in Table 1 (Weights for working samples, Vegetable and Herb Seeds) the following:

<u>Kind of seed</u>	<u>Min. wt. for purity anal. (g)</u>	<u>Min. wt. for noxious-weed seed exam. (g)</u>	<u>Approx. no. seeds/gram</u>	<u>Approx. no. seeds/oz.</u>
<u>Allium fistulosum</u> L. Welsh onion	10	50		

2) Include in Table 3 (Methods of testing for laboratory germination, Vegetable and Herb Seeds) the following:

<u>Kind of seed</u>	<u>Substrata</u>	<u>°C Temp.</u>	<u>First count days</u>	<u>Final count days</u>	<u>Spec. requir. and photo. #</u>	<u>Fresh and dormant seed</u>
<u>Allium fistulosum</u> Welsh onion	B,T	20	6	10		

SUPPORTING EVIDENCE OR REASONS FOR THE PROPOSED RULE:

Allium fistulosum, Welsh onion, was added to the Federal Seed Act on November 21, 1955 (1). The proposal to add this kind to the Federal Seed Act was published in the Federal Register on May 27, 1955 (2), public hearings were scheduled for June 20, 24 and July 28, 1955, and written comments were requested.

The seed unit is a true seed. Seed weight is not given in the Federal Seed Act.

Welsh onion was included in the Uniform Classification of Weed and Crop Seeds in the revision of 1964 (3) and is given a "1" classification, meaning seeds of this kind are to be regarded as crop seeds in all samples when occurring in any

amount. Allium fistulosum is found in the rules for seed testing of the International Seed Testing Association (4).

Literature Cited:

(1) 20 FR 7928

(2) 20 FR 3745

(3) Association of Official Seed Analysts. 1952. Uniform classification of weed and crop seeds. Contribution to the Handbook on Seed Testing. Revised 1964. 33 pp.

(4) International Seed Testing Association. 1985. International rules for seed testing. Seed Sci. and Tech. 13 (2). Revised 1987. 520 pp.

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PROPOSAL

NO. 21

KIND OF SEED:Medicago truncatula, barrelclover

PRESENT RULE:

New Rule

PROPOSED RULE:

1) Include in Table 1 (Weights for working samples, Agricultural Seeds) the following:

<u>Kind of seed</u>	<u>Min. wt. for purity anal. (g)</u>	<u>Min. wt. for noxious-weed seed exam. (g)</u>	<u>Approx. no. seeds/gram</u>	<u>Approx. no. seeds/oz.</u>
<u>Medicago truncatula</u> Gaertner, barrelclover	10	100	250	7088

2) Include in Table 3 (Methods of testing for laboratory germination, Agricultural Seeds) the following:

<u>Kind of seed</u>	<u>Substrata</u>	<u>°C Temp.</u>	<u>First count days</u>	<u>Final count days</u>	<u>Spec. requir. and photo. #</u>	<u>Fresh and dormant seed</u>
<u>Medicago truncatula</u> barrelclover	B,T	20	4	14 ^a	See sec. 4.9-C.	

SUPPORTING EVIDENCE OR REASONS FOR THE PROPOSED RULE:

Medicago truncatula, barrelclover, was added to the Federal Seed Act on October 6, 1967 (1). The rule proposal was published in the Federal Register on January 17, 1967 (2). A public hearing was held on the proposal on February 25, 1967 and written comments were requested. On July 1, 1976 (3) the scientific name of barrelclover was changed in the Federal Seed Act from Medicago tribuloides to M. truncatula, the minimum weight for purity analysis was changed from 50 grams to 10 grams, the minimum weight for noxious-weed seed examination was changed from 300 grams to 100 grams, and the value of 250 seeds/gram was added.

The seed unit is a true seed. The approximate number of seeds/ounce, not given in the Federal Seed Act, was calculated by multiplying the value of 250 seeds/gram by the factor of 28.35 grams/ounce.

Barrelclover is a kind found in the rules for seed testing of the International Seed Testing Association (4). Barrelclover is listed in the Uniform Classification of Weed and Crop Seeds (5) and is given a "1" classification, meaning seeds of this kind are to be regarded as crop seeds in all samples when occurring in any amounts.

Literature Cited:

(1) 32 FR 12778

(2) 32 FR 454

(3) 41 FR 20155

(4) International Seed Testing Association. 1985. International rules for seed testing. Seed Sci. and Tech. 13(2). Revised 1987. 520 pp.

(5) Association of Official Seed Analysts. 1952. Uniform classification of weed and crop seeds. Contribution No. 25 to the Handbook on Seed Testing. Revised 1977. 36pp.

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PROPOSAL

NO. 22

KIND OF SEED:Elytrigia dasystachya, streambank wheatgrass

PRESENT RULE:

New Rule

PROPOSED RULE:

1) Include in Table 1 (Weights for working samples, Agricultural Seeds) the following:

<u>Kind of seed</u>	<u>Min. wt. for purity anal. (g)</u>	<u>Min. wt. for noxious-weed seed exam. (g)</u>	<u>Approx. no. seeds/gram</u>	<u>Approx. no. seeds/oz.</u>
<u>Elytrigia dasystachya</u> (Hook.) A. Löve and D. Löve, streambank wheatgrass	10	50	370	10,490

2) Include in Table 3 (Methods of testing for laboratory germination, Agricultural Seeds) the following:

<u>Kind of seed</u>	<u>Substrata</u>	<u>°C Temp.</u>	<u>First count days</u>	<u>Final count days</u>	<u>Spec. requir. and photo. #</u>	<u>Fresh and dormant seed</u>
<u>Elytrigia dasystachya</u> streambank wheatgrass	P,TB	15-25	5	14	Light and KNO ₃ optional	Prechill at 5° or 10° C. for 5 days

SUPPORTING EVIDENCE OR REASONS FOR THE PROPOSED RULE:

Elytrigia dasystachya, streambank wheatgrass, was added to the Federal Seed Act on July 1, 1963 (1). The proposal was published in the Federal Register on January 22, 1963 (2), public hearings were conducted February 25, 1963, and written comments were requested.

The seed unit is a caryopsis or a single floret. The approximate number of seeds/ounce was calculated by multiplying the value of 370 seeds/gram by the factor of 28.35 grams/ounce.

The scientific name of streambank wheatgrass used in the Federal Seed Act is Agropyron riparium. The currently accepted nomenclature is Elytrigia dasystachya (3). Streambank wheatgrass is included in the rules for seed testing of the International Seed Testing Association (4). Streambank wheatgrass is found in the Uniform Classification of Weed and Crop Seeds (5) and is given the "1" classification, meaning seeds of this kind are to be regarded as crop seeds in all samples when occurring in any amounts.

Literature Cited:

(1) 28 FR 5361

(2) 28 FR 558

(3) Terrell, E., S.R. Hill, J. H. Wiersema, and W. E. Rice. 1986. A checklist of names for 3,000 vascular plants of economic importance. USDA, Agric. Handbook No. 505, 244 pp.

(4) International Seed Testing Association. 1985. International rules for seed testing. Seed Sci. and Tech. 13(2). Revised 1987. 520 pp.

(5) Association of Official Seed Analysts. 1952. Uniform classification of weed and crop seeds. Contribution No. 25 to the Handbook on Seed Testing. Revised 1977. 36pp.

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PROPOSAL

NO. 23

KIND OF SEED:Phleum bertolonii, turf timothy

PRESENT RULE:

New Rule

PROPOSED RULE:

1) Include in Table 1 (Weights for working samples, Agricultural Seeds) the following:

<u>Kind of seed</u>	<u>Min. wt. for purity anal. (g)</u>	<u>Min. wt. for noxious-weed seed exam. (g)</u>	<u>Approx. no. seeds/gram</u>	<u>Approx. no. seeds/oz.</u>
<u>Phleum</u> <u>bertolonii</u> DC. turf timothy	1	10	2,565	72,718

2) Include in Table 3 (Methods of testing for laboratory germination, Agricultural Seeds) the following:

<u>Kind of seed</u>	<u>Substrata</u>	<u>°C Temp.</u>	<u>First count days</u>	<u>Final count days</u>	<u>Spec. requir. and photo. #</u>	<u>Fresh and dormant seed</u>
<u>Phleum</u> <u>bertolonii</u> turf timothy	P,TB	15-25; 20-30	5	10	Light	KNO ₃ & prechill at 5° or 10° C. for 5 days

SUPPORTING EVIDENCE OR REASONS FOR THE PROPOSED RULE:

Phleum bertolonii, turf timothy, was added to the Federal Seed Act on July 1, 1976 (1). The proposal was originally published in the Federal Register on September 3, 1975 (2). Public hearings were held on the proposal on October 7, 1975, and written comments were invited.

The seed unit is a caryopsis or a single floret. The approximate number of seeds/ounce, not given in the Federal Seed Act, was calculated by multiplying the value of 2,565 seeds/gram by the factor of 28.35 grams/ounce.

The scientific name given for turf timothy in the original proposal (1) and in the October 1987 revision of the Federal Seed Act is Phleum nodosum. Phleum bertolonii, the scientific name used in this proposal, is the currently accepted nomenclature for turf timothy (3). Turf timothy is included in the rules for testing seeds of the International Seed Testing Association (4). Turf timothy is listed in the Uniform Classification of Weeds and Crop Seeds (5) and given the "1" classification, meaning seeds of this kind are to be regarded as crop seeds in all samples when occurring in any amounts.

Literature Cited:

(1) 41 FR 20155

(2) 40 FR 40524

(3) Terrell, E., S.R. Hill, J. H. Wiersema, and W. E. Rice. 1986. A checklist of names for 3,000 vascular plants of economic importance. USDA, Agric. Handbook No. 505, 244 pp.

(4) International Seed Testing Association. 1985. International rules for seed testing. Seed Sci. and Tech. 13(2). Revised 1987. 520 pp.

(5) Association of Official Seed Analysts. 1952. Uniform classification of weed and crop seeds. Contribution No. 25 to the Handbook on Seed Testing. Revised 1977. 36pp.

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PROPOSAL

NO. 24

KIND OF SEED:Agropyron fragile subsp. sibericum, Siberean wheatgrass

PRESENT RULE:

New Rule

PROPOSED RULE:

1) Include in Table 1 (Weights for working samples, Agricultural Seeds) the following:

<u>Kind of seed</u>	<u>Min. wt. for purity anal. (g)</u>	<u>Min. wt. for noxious-weed seed exam. (g)</u>	<u>Approx. no. seeds/gram</u>	<u>Approx. no. seeds/oz.</u>
<u>Agropyron fragile</u> (Roth.) Candargy subsp. <u>sibericum</u> (Willd.) Meld., Siberean wheatgrass	5	50		

2) Include in Table 3 (Methods of testing for laboratory germination, Agricultural Seeds) the following:

<u>Kind of seed</u>	<u>Substrata</u>	<u>°C Temp.</u>	<u>First count days</u>	<u>Final count days</u>	<u>Spec. requir. and photo. #</u>	<u>Fresh and dormant seed</u>
<u>Agropyron</u> <u>fragile</u> subsp. <u>sibericum</u> , Siberean wheatgrass	P,T,B	15-25	7	14	Light and KNO ₃ optional	Prechill at 5° or 10° C. for 7 days

SUPPORTING EVIDENCE OR REASONS FOR THE PROPOSED RULE:

Agropyron fragile subsp. sibericum, Siberean wheatgrass, was added to the Federal Seed Act on November 25, 1961 (1). The proposal was published in the Federal Register on May 13, 1961 (2), public hearings were held on June 19 and June 29, 1961, and written comments were requested. On July 1, 1976 (3), the minimum weight for purity analysis was changed from 10 grams to 5 grams.

The seed unit is a caryopsis or a single floret. Seed weights for this kind are not given in the Federal Seed Act. The scientific name used for Siberan

wheatgrass in the Federal Seed Act is Agropyron sibericum. The nomenclature used in the proposal is the currently accepted Agropyron fragile subsp. sibericum (4). Siberean wheatgrass is listed in the Uniform Classification of Weed and Crop Seeds (5) and given the classification of "1," meaning seeds of this kind are to be regarded as crop seeds in all samples when occurring in any comments.

Literature Cited:

(1) 26 FR 10035

(2) 26 FR 4169

(3) 41 FR 20155

(4) Terrell, E., S.R. Hill, J. H. Wiersema, and W. E. Rice. 1986. A checklist of names for 3,000 vascular plants of economic importance. USDA, Agric. Handbook No. 505, 244 pp.

(5) Association of Official Seed Analysts. 1952. Uniform classification of weed and crop seeds. Contribution No. 25 to the Handbook on Seed Testing. Revised 1977. 36pp.

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PROPOSAL

NO. 25

KIND OF SEED:Lolium rigidum, Wimmera ryegrassPRESENT RULE:

New Rule

PROPOSED RULE:

1) Include in Table 1 (Weights for working samples, Agricultural Seeds) the following:

<u>Kind of seed</u>	<u>Min. wt. for purity anal. (g)</u>	<u>Min. wt. for noxious-weed seed exam. (g)</u>	<u>Approx. no. seeds/gram</u>	<u>Approx. no. seeds/oz.</u>
<u>Lolium rigidum</u> Gaudin Wimmera ryegrass	5	50		

2) Include in Table 3 (Methods of testing for laboratory germination, Agricultural Seeds) the following:

<u>Kind of seed</u>	<u>Substrata</u>	<u>°C Temp.</u>	<u>First count days</u>	<u>Final count days</u>	<u>Spec. requir. and photo. #</u>	<u>Fresh and dormant seed</u>
<u>Lolium rigidum</u> Wimmera ryegrass	P, TB	15-25; 20-30	5	14	Light optional	Light; KNO ₃ ; prechill at 5° or 10° C. for 5 days & test at 15-25°C; if neces. rechill for 3 days and cont. test at 15-25°C. additional 4 days.

SUPPORTING EVIDENCE OR REASONS FOR THE PROPOSED RULE:

Lolium rigidum, Wimmera ryegrass, was added to the Federal Seed Act on November 25, 1961 (1). The proposal to add this kind was published in the Federal Register on May 13, 1961 (2), and public hearings were scheduled for June 19 and June 29, 1961. Written comments were invited.

The seed unit is a caryopsis or a single floret. Seed weights are not given in the Federal Seed Act.

Wimmera ryegrass is included in the Uniform Classification of Weed and Crop Seeds (3) and is given a "1" classification, meaning seeds of this kind are to be regarded as crop seeds in all samples when occurring in any amounts.

Literature Cited:

(1) 26 FR 10035

(2) 26 FR 4169

(3) Association of Official Seed Analysts. 1952. Uniform classification of weed and crop seeds. Contribution No. 25 to the Handbook on Seed Testing. Revised 1977. 36pp.

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PROPOSAL

NO. 26

KIND OF SEED:Cucumis anguria, West India gherkin

PRESENT RULE:

New Rule

PROPOSED RULE:

1) Include in Table 1 (Weights for working samples, Vegetable and Herb Seeds) the following:

<u>Kind of seed</u>	<u>Min. wt. for purity anal. (g)</u>	<u>Min. wt. for noxious-weed seed exam. (g)</u>	<u>Approx. no. seeds/gram</u>	<u>Approx. no. seeds/oz.</u>
<u>Cucumis anguria</u> L. West India gherkin	16	160	153	4338

2) Include in Table 3 (Methods of testing for laboratory germination, Vegetable and Herb Seeds) the following:

<u>Kind of seed</u>	<u>Substrata</u>	<u>°C Temp.</u>	<u>First count days</u>	<u>Final count days</u>	<u>Spec. requir. and photo. #</u>	<u>Fresh and dormant seed</u>
<u>Cucumis anguria</u> West India gherkin	B,T,S	20-30	3	7		Test at 30°C.

SUPPORTING EVIDENCE OR REASONS FOR THE PROPOSED RULE:

Cucumis anguria, West India gherkin, was added to the Federal Seed Act on July 1, 1976 (1). The proposal was originally published in the Federal Register on September 3, 1975 (2). Public hearings on the proposal were held on October 7, 1975, and written comments were invited.

The seed unit is a true seed. The approximate number of seeds/ounce, not given in the Federal Seed Act, was calculated by multiplying the value of 153 seeds/gram by the factor of 28.35 grams/ounce.

Literature Cited:

- (1) 41 FR 20155
- (2) 40 FR 40524

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PROPOSAL

NO. 27

KIND OF SEED:Brassica napus var. pabularia, Siberian kale

PRESENT RULE:

New Rule

PROPOSED RULE:

1) Include in Table 1 (Weights for working samples, Vegetable and Herb Seeds) the following:

<u>Kind of seed</u>	<u>Min. wt. for purity anal. (g)</u>	<u>Min. wt. for noxious-weed seed exam. (g)</u>	<u>Approx. no. seeds/gram</u>	<u>Approx. no. seeds/oz.</u>
<u>Brassica napus</u> var. <u>pabularia</u> (DC.) Reichb., Siberian kale	10	50		

2) Include in Table 3 (Methods of testing for laboratory germination, Vegetable and Herb Seeds) the following:

<u>Kind of seed</u>	<u>Substrata</u>	<u>°C Temp.</u>	<u>First count days</u>	<u>Final count days</u>	<u>Spec. requir. and photo. #</u>	<u>Fresh and dormant seed</u>
<u>Brassica napus</u> var. <u>pabularia</u> Siberian kale	B	20-30	3	7		

SUPPORTING EVIDENCE OR REASONS FOR THE PROPOSED RULE:

Brassica napus var. pabularia, Siberian kale, was added to the Federal Seed Act on July 1, 1963 (1). The proposal was originally published in the Federal Register on January 22, 1963 (2). A public hearing was held on February 25, 1963 and written comments on the proposal were requested.

The seed unit is a true seed. Seed weights are not given in the Federal Seed Act.

Brassica napus is included in the rules for seed testing of the International Seed Testing Association (3). Siberian kale is listed in the Uniform

Classification of Weed and Crop Seeds (4) and is given a "1" classification, meaning seeds of this kind are to be regarded as crop seeds in all samples when occurring in any amount.

Literature Cited:

(1) 28 FR 5361

(2) 28 FR 558

(3) International Seed Testing Association. 1985. International rules for seed testing. Seed Sci. and Tech. 13 (2). Revised 1987. 520 pp.

(4) Association of Official Seed Analysts. 1952. Uniform classification of weed and crop seeds. Contribution No. 25 to the Handbook on Seed Testing. Revised 1977. 36 pp.

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