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## The Viability of Weed Seeds under Different Conditions of Treatment, and a Study of Their Dormant Periods

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THE VIABILITY OF WEED SEEDS UNDER DIFFERENT CONDITIONS OF  
TREATMENT, AND A STUDY OF THEIR DORMANT PERIODS.

BY H. S. FAWCETT.

The viability of a seed is its capacity to live after maturity, and its dormant period is the time required for the seed to germinate after being planted.

A great deal of investigation has been carried on for many years past to determine the viability of seeds; more especially of cultivated seeds of the farm and garden, but not so much attention has been given to weed seeds. In 1897 Mr. C. R. Ball of this college published an article on "Seed Testing; Its Importance, History and Some Results, With a Partial Bibliography." This article contains a long and valuable bibliography referring to all the most important literature before 1897.

Some of the recent articles on the subject are: Bull. 38 of the Nevada Station, on "Nevada and Other Weed Seeds," with figures of weed seeds by F. H. Hillman; "The Germination of Weed Seeds," by L. H. Pammel and G. M. Lummis, 1902; Bull. 58 of the Bureau of Plant Industry, on "The Vitality and Germination of Seeds," by J. W. T. Duvel, and "Rules and Apparatus for Seed Testing," in Circular 34 of the Office of Experiment Stations, 1904.

The object of the present investigation was to make a comparative study of the viability of different species of weed seeds, especially those found in cultivated fields and pastures, and to study their dormant periods in order to determine if possible any means of destroying these seeds. A test was also made of the effect of freezing and thawing on the vitality and the length of the dormant period for each species.

Ninety-two samples of weed seeds, representing fifty-two different species, were used. These samples were collected in September, October and November of 1904. Care was taken to collect, whenever possible, thoroughly mature seeds. The seeds were nearly all collected before they dropped to the ground and when dry they were threshed out and placed in paper envelopes.

For the germination tests fifty seeds of each sample were placed in sand, in boxes, under benches in the greenhouse, and kept as near as possible under uniform conditions. These tests were repeated each month from November until May, all the boxes of all previous months being left. All the boxes were kept moist and a daily record was kept of the number of seeds germinating. In addition to these tests seeds from a large number of these samples were placed out of doors in order to expose them to the effects of freezing and thawing. The seeds were placed in sacks inside a thin wooden box and a thin layer of sand placed around them. The box was then sunk into the ground so that the top part was just exposed. These seeds were taken out in April and planted side by side with seeds from the same sample that had been in doors all winter.

The results of these investigations are shown in the accompanying tables. The general effect of exposing the seeds to thawing and freezing was both to increase the percentage of germination and to shorten the dormant period. This was especially true of seeds with hard seed coats. Where the seed possessed thin and delicate seed coats the effect in a few cases was to lessen or destroy the vitality of the seeds.

Three samples of the common pigweed (*Amarantus retroflexus*) showed an average dormant period of nine and one-third days for those kept indoors and only six and one-third days for those exposed, an increase of about 50 per cent. For Wild Rye (*Elymus canadensis*) the dormant period was lessened from nine to five days and the percentage increased from 22 to 48 on account of exposure. In four samples of Foxtail (*Setaria glauca*) the average dormant period was lessened from eleven and one-quarter to seven days and the percentage of germination increased from 34.5 to 38 per cent because of exposure.

It is to be seen from an examination of the tables of November and December that as a rule the highest dormant periods are found in those seeds that have the hardest and thickest seed coats. For these two months, Rag Weed (*Ambrosia trifida*) and Barn Yard Grass (*Panicum crus-galli*) have the longest dormant periods, that for the Rag Weed being one hundred and fifty-two days and that for Barn Yard Grass one hundred and seventy-eight days. It was late in the spring before either would germinate. It is seen also from the tables that for some of the hard seeded species the dormant period decreases in each succeeding month not quite in proportion to the time between the successive plantings. This shows that these species refuse to germinate even under the most favorable conditions until they have had a period of rest. The tables also show a general falling off of the percentage of germination for those seeds planted in January and February, as compared with the two months preceding and the two months following. This indicates that there are two natural periods for the best seed germination, the fall and the spring.

The entire test experiment shows a very low average per cent of germination, although care was taken to collect seeds from healthy, mature plants. This suggests one of two things, either that the average per cent of fertile weed seeds is low or that many seeds quickly lose their vitality if they are not allowed to come in contact with moist soil.

The highest average percentage of germination, as well as the shortest dormant periods, is shown by the common mustard (*Brassica sinapistrum*). The percentage of germination for November and December was 100 per cent and for the six months 90.3 per cent. Both Mustard and Yarrow showed a gradual decrease in vitality from month to month, while the dandelion showed a gradual increase.

The general conclusion to be drawn from these experiments is that most weed seeds with thick seed coats require a more or less extended period of rest after maturity, that the seed of the Mustard and Pepper Grass require little time for rest, that the vitality of nearly all weed seeds is weakened by drying out and that the power of germination is increased by exposure to the natural periods for the best seed germination, the fall and the spring.

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VIABILITY OF WEED SEEDS.

APRIL Name of Plant	Kept Indoors During Winter				Exposed to Freezing and Thawing						
	No. of seeds	Date of planting	Days dormant	No. of Days Required for Germination	No. of seeds germinating	Percent of germination	No. of seeds	Days dormant	No. of Days Required for Germination	No. of seeds germinated	Percent of germination
<i>Rumex crispus</i> —											
Curled Dock	50	4-14	9	On 10th day, 2; 18th, 1	3	6					
Curled Dock	50	4-14									
<i>Chenopodium album</i> —											
Pigweed album	50	4-14					50				
Pigweed album	50	4-14	11	On 11th day, 3	3	6	50	9	On 10th day, 5	5	10
Pigweed album	50	4-14	7	On 18th day, 3; 10th, 1	4	8	50	7	On 8th day, 18; 9th, 2; 11th, 1; 20th, 2	23	46
Pigweed album	50	4-14					50	5	On 6th day, 9; 9th, 2	11	22
<i>Amarantus retrofractus</i> —											
Tumbleweed	50	4-14					50				
Tumbleweed	50	4-14	7	On 8th day, 4; 14th, 2	6	12					
Tumbleweed	50	4-14	7	On 8th day, 1; 10th, 4; 11th, 2	7	14	50	7	On 8th day, 2; 10th, 6; 11th, 3	11	22
Tumbleweed	50	4-14	9	On 10th day, 1	1	2	50	9	On 10th day, 2; 11th, 2	4	8
Tumbleweed	50	4-14	5	On 6th day, 4; 9th, 4	8	16	50	5	On 6th day, 4; 9th, 9	13	26
<i>Amarantus blitoides</i>	50	4-14	11	On 12th day, 6; 13th, 6; 24th, 1	13	26	50	11	On 12th day, 5; 13th, 6; 22nd, 3	14	28
<i>Ambrosia artemisiifolia</i> —											
Ragweed	50	4-14									
Ragweed	50										
<i>Setaria glauca</i> —											
Yellow Foxtail	50		9	On 10th day, 4; 11th, 5; 12th, 4; 18th, 3	14	28	50	6	On 7th day, 5; 9th, 8; 10th, 2; 11th, 1	16	32
Yellow Foxtail			11	On 12th day, 2; 13th, 8; 25th, 1	11	22	50	9	On 9th day, 13; 12th, 5; 20th, 1	19	38
<i>Setaria viridis</i> —											
Green Foxtail	50		6	On 7th day, 2; 10th, 36; 12th, 2; 25th, 1	41	82	50	6	On 7th day, 1; 10th, 19; 14th, 5; 16th, 3; 19th, 1	29	58
Green Foxtail	50		7	On 8th day, 13; 14th, 2; 15th, 1	16	32	50				
Green Foxtail	50		19	On 20th day, 1	1	2	50	7	On 8th day, 3; 10th, 2; 11th, 4; 12th, 3	12	24
Green Foxtail	50		6	On 7th day, 8; 10th, 12; 14th, 1; 25th, 1	22	44	50				
<i>Panicum capillare</i> —											
Old Witch Grass	50		13	On 14th day, 1	1	2	50	11	On 12th day, 1	1	2
Old Witch Grass	50						50	33	On 34th day, 1	1	2
<i>Panicum crus galli</i> —											
Barnyard Grass	50		13	On 14th day, 1	1	2	50				
<i>Elymus canadensis</i> —											
Wild Rye	50		9	On 9th day, 1	1	2	50	5	On 6th day, 9; 8th, 2; 10th, 10; 12th, 2; 15th, 1	24	48
<i>Asclepias cornuti</i> —											
Milkweed	50						13		On 14th day, 4	4	8

VIABILITY OF WEED SEEDS—CONTINUED.

APRIL—Cont'd Name of Plant	Kept Indoors During Winter				Exposed to Freezing and Thawing			
	No. of seeds	Date of planting Days dormant	No. of Days Required for Germination	No. of seeds germinating Per cent of germination	No. of seeds dormant	No. of Days Required for Germination	No. of seeds germinated Per cent of germination	
<i>Polygonum pennsylvanicum</i> —								
Smartweed -----	50							
Smartweed -----	50							
Smartweed -----	50				50	9	On 10th day, 25; 11th, 3; 12th, 5; 15th, 3	
Smartweed -----	50				50	7	On 8th day, 2	
<i>Lepidium apetalum</i> —								
Pepper-grass -----	50	4-14	7	On 8th day, 20; 12th, 8; 14th, 1	29	54	50	
Pepper-grass -----	50		0					
<i>Lepidium virginicum</i> —	50		0					
<i>Capsella bursa-pastoris</i> —								
Shepherd's Purse -----	50		11	On 12th day, 1	1	2	50	
<i>Sisymbrium officinale</i> —								
Hedge Mustard -----	50		7	On 8th day, 7; 12th, 5; 25th, 1	13	26		
<i>Brassica sinapistrum</i> —								
Mustard -----	50		3	On 4th day, 32; 8th, 6; 12th, 4; 34th, 1	43	86	50	
<i>Brassica nigra</i> —								
Mustard -----	50		7	On 8th day, 7; 12th, 1	8	9	50	
Mustard -----	50							
<i>Achillea millefolium</i> —								
Yarrow -----	50							
<i>Taraxacum officinale</i> —								
Dandelion -----	50		7	On 8th day, 5; 10th, 16; 12th, 2; 18th, 3	26	52		
<i>Sonchus oleraceus</i> -----	50		7	On 8th day, 13; 10th, 2; 12th, 2	17	34		
<i>Lactuca ludoviciana</i> —								
Wild Lettuce -----	50		9	On 10th day, 1; 12th, 1; 20th, 1; 22nd, 1	4	8		
<i>Eupatorium purpureum</i> —								
Joe Pye Weed -----	50							
<i>Bidens frondosa</i> —								
Stick-tight -----	50							
Stick-tight -----	50							
<i>Verbascum thapsus</i> —								
Mullein -----	50	4-18						
<i>Cassia chamaecrista</i> -----	50							
					50	7	On 10th day, 3; 11th, 8; 12th, 1; 18th, 2; 20th, 1	
					50	6	On 7th day, 1	
					50	7	On 8th day, 1; 10th, 1; 12th, 1	
					50	7	On 8th day, 1; 16th, 1; 20th, 1	

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<i>Portulaca oleracea</i> —												
Purslane -----	50	6	On 7th day, 3-----	3	6							
Purslane -----	50											
Purslane -----	50	13	On 14th day, 14-----	14	28	50	13	On 14th day, 6-----		6	12	
<i>Oenothera biennis</i> —												
Evening Primrose-----	50	13	On 14th day, 2; 16th, 1-----	3	6	50	13	On 14th day, 2-----		2	4	
Evening Primrose-----	50	7	On 8th day, 1-----	1	2	50	11	On 12th day, 1-----		1	2	
<i>Verbena urticifolia</i> —												
Wild Verbena -----	50	13	On 14th day, 1; 16th, 1-----	2	4	50	6	On 7th day, 6; 10th, 5; 12th, 4; 18th, 1-----		16	32	
<i>Verbena stricta</i> —												
Blue Vervain -----	50											
<i>Teucrium canadense</i> -----	50	19	On 20th day, 1; 23rd, 2-----	3	6	50	19	On 20th day, 4; 22nd, 2-----		6	12	
<i>Nepeta glechoma</i> —												
Ground Ivy -----	50											
<i>Plantago major</i> —												
Plantain -----	50	17	On 18th day, 2-----	2	4	50	5	On 6th day, 30; 8th, 6; 13th, 2-----		38	76	
	50	9	On 10th day, 2; 22nd, 1; 25th, 1-----	4	8	50	9	On 10th day, 2-----		2	4	
<i>Datura stramonium</i> —												
Jimson Weed -----	50											
<i>Polanisia trachysperma</i> —												
Polanisia -----	50	11	On 12th day, 2; 13th, 1-----	3	6	50						

VIABILITY OF WEED SEEDS—CONTINUED.

Sample No.	NOVEMBER Name of Plant	No. of seeds	Date of col- lection	Date of planting	Days dor- mant	No. of Days Required for Germination	No. seeds germinating Per cent of germination	
1	<i>Rumex crispus</i> —							
	Curled Dock -----	50	10-7	10-14		None germinated		
18	Curled Dock -----	50	9-7	9-24	128	On 129th day, 1; 140th, 1	2	4
	<i>Chenopodium album</i> —							
2	Pigweed -----	50	10-7	10-14		None germinated		
20	Pigweed -----	50	9-7	9-24	29	On 30th day, 1	1	2
32	Pigweed -----	50	10-7	10-22	130	On 131st day, 1	1	2
43	Pigweed -----	50	10-7	10-23		None germinated		
73	Pigweed -----	50	11-7	11-14	65	On 63th day, 5; 71st, 1; 75th, 1; 121st, 1	8	16
	<i>Amarantus retroflexus</i> —							
35	Green Pigweed -----	50	10-7	10-22	69	On 70th day, 4	4	8
3	Green Pigweed -----	50	10-7	10-14	29	On 30th day, 8; 45th, 7; 65th, 1	16	32
42	Green Pigweed -----	50	10-22	10-23	63	On 64th day, 1; 70th, 5	6	12
53	Green Pigweed -----	50	10-24	10-23	74	On 75th day, 1	1	2
69	Green Pigweed -----	50	10-24	11-4	45	On 46th day, 2	2	4
80	Green Pigweed -----	50	10-22	11-4	72	On 73rd day, 1	1	2
	<i>Amarantus blitoides</i> —							
6	Amaranth -----	50	10-7	10-14	83	On 8th day, 2	2	4
	<i>Ambrosia artemisiaefolia</i> —							
9	Ragweed -----	50	10-7	10-14	117	On 148th day, 1; 150th, 1	2	4
34	Ragweed -----	50	10-7	10-22	102	On 103rd day, 1; 130th, 2; 140th, 4; 150th, 1; 160th, 1	9	18
71	Ragweed -----	50	10-22	11-4	124	On 125th day, 3	3	6
	<i>Ambrosia trifida</i> —							
11	Great Ragweed -----	50	10-7	10-14	144	On 145th day, 1; 150th, 1; 180th, 1	3	6
46	Great Ragweed -----	25	10-17	10-23	129	On 130th day, 2; 140th, 1; 150th, 1	4	16
87	Great Ragweed -----	50	11-5	11-11		None germinated		
	<i>Setaria glauca</i> —							
4	Foxtail, Pigeon grass -----	50	10-7	10-14	18	On 19th day, 1; 150th, 7; 100th, 2	10	20
25	Foxtail, Pigeon grass -----	50	9-9	9-24	9	On 10th day, 1; 95th, 1	2	4
56	Foxtail, Pigeon grass -----	50	10-17	10-23	23	On 29th day, 1; 150th, 1	2	4
	<i>Setaria viridis</i> —							
5	Green Foxtail -----	50	10-7	10-21	8	On 9th day, 20; 130th, 1	21	42
33	Green Foxtail -----	50	10-7	10-22	12	On 13th day, 19; 29th, 5; 51st, 3; 140th, 1	28	56
55	Green Foxtail -----	50	10-17	10-23	63	On 64th day, 1; 140th, 2; 160th, 1; 170th, 1	5	10
	<i>Panicum capillare</i> —							
48	Old Witch-grass -----	50	10-17	10-23		None germinated		
7	Old Witch-grass -----	50	10-7	10-14		None germinated		
57	Old Witch-grass -----	50	10-22	11-4	35	On 35th day, 1; 51st, 2	3	6
76	Old Witch-grass -----	50	10-22	11-4		None germinated		
10	<i>Panicum crus galli</i> —							
	Barnyard Grass -----	50	10-7	10-14	176	On 177th day, 1	1	2

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26	<i>Hordeum jubatum</i> — Squirrel-tail Grass	50	9-7	9-24	13	On 14th day, 12; 21st, 10; 41st, 1	23	46
78	<i>Agropyrum tenerum</i> — Couch-grass	50	10-22	11-4	11	On 12th day, 3; 29th, 1; 140th, 5; 160th, 2	11	22
81	<i>Elymus canadensis</i> — Wild Rye	50	11-5	11-11	-----	No seeds germinated	-----	-----
49	<i>Asclepias Cornuti</i> — Milkweed	50	10-7	10-14	-----	No seeds germinated	-----	-----
12	Milkweed	25	10-22	10-28	137	On 138th day, 2; 150th, 1	3	6
22	<i>Polygonum pennsylvanicum</i> — Smartweed	50	10-7	10-21	-----	No seeds germinated	-----	-----
15	Smartweed	50	10-7	10-21	-----	No seeds germinated	-----	-----
36	Smartweed	50	10-7	10-22	-----	No seeds germinated	-----	-----
79	Smartweed	50	10-7	11-11	-----	No seeds germinated	-----	-----
16	<i>Lepidium apetalum</i> — Peppergrass	50	9-7	9-24	19	On 20th day, 1	1	2
5.75	Peppergrass	50	10-22	11-4	13	On 14th day, 4; 17th, 3; 19th, 2; 21st, 4; 28th, 2; 34th, 1	16	32
84	<i>Lepidium virginicum</i> — Peppergrass	50	11-5	11-11	14	On 15th day, 1; 23rd, 7; 24th, 2; 46th, 5; 70th, 1	16	32
19	<i>Capsella bursa-pastoris</i> — Shepherd's Purse	50	9-7	10-24	5	On 6th day, 3; 11th, 1; 19th, 2; 36th, 3	9	18
17	<i>Brassica sinapistrum</i> — Mustard Charlock	50	9-7	9-25	5	On 6th day, 50	50	100
54	<i>Brassica nigra</i> — Black Mustard	50	10-28	10-28	19	On 20th day, 1; 40th, 1	2	4
86	Black Mustard	50	11-5	11-11	-----	No seeds germinated	-----	-----
8	<i>Bidens frondosa</i> — Bur-Marigold	50	10-7	10-14	-----	No seeds germinated	-----	-----
37	Bur-Marigold	50	10-22	10-22	-----	No seeds germinated	-----	-----
31	Bur-Marigold	50	10-22	10-22	139	On 140th day, 2; 150th, 2	4	8
13	<i>Erigeron canadensis</i> — Horse-weed	50	10-7	10-14	8	On 9th day, 27; 28th, 1	28	56
66	Horse-weed	50	10-22	11-4	-----	No seeds germinated	-----	-----
70	Horse-weed	50	10-22	11-4	9	On 10th day, 1	1	2
52	<i>Solidago rigida</i> — Rigid Goldenrod	50	10-17	10-28	-----	No seeds germinated	-----	-----
58	<i>Achillea millefolium</i> — Yarrow	50	10-24	11-4	9	On 10th day, 4; 11th, 3; 34th, 7; 36th, 5; 66th, 4	23	46
50	<i>Arctium lappa</i> — Burdock	50	10-24	10-28	9	On 10th day, 2; 42nd, 1; 80th, 1	4	8
23	<i>Sonchus oleraceus</i> — Sow Thistle	50	10-22	10-24	5	On 6th day, 6; 9th, 6; 40th, 9; 75th, 3; 78th, 1; 160th, 1	23	52
24	<i>Lactuca ludoviciana</i> — Wild Lettuce	50	10-22	10-24	5	On 6th day, 1; 8th, 2; 20th, 1; 24th, 1	5	10
89	<i>Taraxacum officinale</i> — Dandelion	50	11-5	11-11	27	On 28th day, 2; 31st, 1; 32nd, 1; 33rd, 1; 46th, 1; 86th, 1	7	14
92	<i>Eupatorium purpureum</i> — Joe Pye Weed	50	10-22	11-11	49	On 50th day, 1	1	2
92	<i>Lophanthus scrophulariae-folius</i> — Giant Hyssop	50	10-22	11-11	-----	None germinated	-----	-----



VIABILITY OF WEED SEEDS—CONTINUED.

Sample No.	NOVEMBER—Continued		No. of seeds	Date of collection	Date of planting	Days dormant	No. of Days Required for Germination	No. seeds germinating	
	Name of Plant							No. seeds germinating	Per cent of germination
14	<i>Convolvulus sepium</i> —		50	10-7	10-14	8	On 9th day, 1; 121st, 1	2	4
41	Bindweed		25	10-17	10-23	72	On 73rd day, 1	1	4
30	<i>Verbascum thapsus</i> —		50	10-7	10-22	26	On 27th day, 2	2	4
67	Mullein		50	10-24	11-4		No seeds germinated		
49	<i>Melilotus alba</i> —		50	10-17	10-22		No seeds germinated		
44	Sweet Clover		50	10-22	10-28	46	On 47th day, 1; 64th, 1; 67th, 1; 82nd, 1; 84th, 1; 95th, 1; 100th, 1	7	14
39	<i>Cassia chamaecrista</i> —		50	10-17	10-22	139	On 140th day, 4	4	8
	Partridge Pea		50	10-24	11-4	130	On 131st day, 2	2	4
40	<i>Acalypha virginica</i> —		50	10-17	10-22		No seeds germinated		
77	3-seeded Mercury		50	10-24	11-4		No seeds germinated		
51	<i>Portulaca oleracea</i> —		50	10-17	10-22		No seeds germinated		
62	Purslane		50	10-15	11-4		No seeds germinated		
68	<i>Mimulus ringens</i> —		50	10-17	10-28		No seeds germinated		
59	<i>Mimulus ringens</i> —		50	10-15	11-4		No seeds germinated		
63	<i>Oenothera biennis</i> —		50	10-17	10-28		No seeds germinated		
72	Primrose		50	11-17	11-26		No seeds germinated		
64	<i>Verbena urticifolia</i> —		50	10-15	11-26		No seeds germinated		
63	Wild Verbena		50	10-15	11-4		No seeds germinated		
72	<i>Verbena stricta</i> —		50	10-15	11-4		No seeds germinated		
63	Blue Vervain		50	10-15	11-4		No seeds germinated		
68	Blue Vervain		50	10-15	11-4		No seeds germinated		
63	<i>Cynoglossum virginicum</i> —		50	10-15	11-6		No seeds germinated		
61	Hound's Tongue		50	10-15	11-4		No seeds germinated		
68	<i>Scrophularia nodosa</i> —		50	10-15	11-4		No seeds germinated		
61	Simpson Honey Plant		50	10-24	11-4		No seeds germinated		
64	<i>Lobelia siphilitica</i> —		50	10-15	11-4		No seeds germinated		
90	Great Blue Lobelia		50	11-5	11-11	9	On 10th day, 1; 79th, 1	2	4
65	<i>Teucrium canadense</i> —		50	10-24	11-4	9	On 10th day, 1	1	2
74	Germander		50	10-24	11-4		No seeds germinated		
	<i>Abutilon avicennae</i> —		50	10-22	11-4		No seeds germinated		
	Velvet Leaf		50	10-22	11-4		No seeds germinated		

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83	<i>Nepeta glechoma</i> — Ground Ivy -----	50	10-22	11-4	9	On 10th day, 1; 45th, 1; 49th, 5; 50th, 1; 51st, 2; 79th, 1-----	11	2
82	<i>Monarda fistulosa</i> — Horse-mint -----	50	10-22	11-11	-----	No seeds germinated -----	-----	-----
85	<i>Plantago major</i> — Plantain -----	50	10-22	11-11	-----	No seeds germinated -----	-----	-----
88	<i>Datura stramonium</i> — Jamestown (Jimson) Weed	50	11-5	11-11	-----	No seeds germinated -----	-----	-----
91	<i>Polanisia trachysperma</i> -----	50	10-22	11-11	-----	No seeds germinated -----	-----	-----
94	<i>Veronica virginica</i> — Culver's Root -----	50	9-14	11-11	-----	No seeds germinated -----	-----	-----

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VIABILITY OF WEED SEEDS—CONTINUED

Sample No.	DECEMBER Name of Plant	No. of seeds	Date of col- lection	Date of planting	Days dor- mant	No. of Days Required for Germination	No. of seeds germinating	Per cent of germination
1	<i>Rumex crispus</i> —	50	---	11-11	---			
18	Curled Dock	50	---	12-2	157	On 158th day, 5	5	10
	<i>Chenopodium album</i> —							
2	Lamb's Quarter	50	---	11-11	---			
29	Lamb's Quarter	50	---	12-2	7	On 8th day, 1; 9th, 1; 11th, 3; 12th, 2; 25th, 6; 29th, 2; 30th, 1	16	32
32	Lamb's Quarter	50	---	11-18	---			
43	Lamb's Quarter	50	---	11-25	---			
73	Lamb's Quarter	50	---	12-2	---			
	<i>Amarantus retroflexus</i> —							
35	Green Pigweed	50	---	11-18	44	On 45th day, 1; 47th, 3	4	8
21	Green Pigweed	50	---	12-2	7	On 8th day, 3; 10th, 3; 11th, 3; 13th, 1; 16th, 2; 30th, 6; 32nd, 1	19	38
42	Green Pigweed	50	---	11-26	12	On 13th day, 2; 18th, 6; 32nd, 1; 61st, 15	24	48
53	Green Pigweed	50	---	11-26	30	On 31st day, 1; 33rd, 4; 62nd, 7	12	24
69	Green Pigweed	50	---	12-5	15	On 16th day, 2; 27th, 1; 35th, 3	6	12
80	Green Pigweed	50	---	12-2	21	On 25th day, 5; 32nd, 3; 34th, 1	9	18
	<i>Amarantus blitoides</i> —							
6	Amaranth	50	---	11-11	26	On 27th day, 5; 28th, 6; 29th, 1; 37th, 1	13	26
	<i>Ambrosia artemisiaefolia</i> —							
9	Ragweed	25	---	11-11	157	On 158th day, 1	1	4
	Ragweed	50	---	11-11	102	On 103rd day, 1	1	2
	<i>Ambrosia trifida</i> —							
	Great Ragweed	50	---	11-11	140	On 141st day, 1	1	2
	<i>Setaria glauca</i> (Foxtail)	50	---	11-11	45	On 46th day, 1; 145th, 1; 174th, 2	4	8
	<i>Setaria glauca</i> (Foxtail)	50	---	12-2	12	On 13th day, 2; 14th, 2; 16th, 2; 35th, 2	8	16
	<i>Setaria glauca</i> (Foxtail)	50	---	11-23	---			
	<i>Setaria viridis</i> (Foxtail)	50	---	11-11	12	On 13th day, 23; 16th, 5; 30th, 2; 41st, 1; 61st, 2	33	66
	<i>Setaria viridis</i> (Foxtail)	50	---	11-26	7	On 8th day, 25; 10th, 6; 13th, 3; 17th, 1; 48th, 1	36	72
	<i>Setaria viridis</i> (Foxtail)	50	---	11-18	---			
	<i>Panicum capillare</i> —							
	Old Witch Grass	50	---	11-26	---			
	Old Witch Grass	50	---	11-11	26	On 27th day, 6; 28th, 3; 37th, 4	13	26
	Old Witch Grass	50	---	12-2	30	On 31st day, 1; 32nd, 2	3	6
	<i>Panicum crus-galli</i> —							
	Barnyard Grass	50	---	11-11	27	On 28th day, 1	1	2
	<i>Agropyrum tenerum</i>	25	---	---	---			
	Couch Grass	---	---	12-2	9	On 10th day, 7; 11th, 5; 14th, 2; 16th, 3	17	34
	<i>Elymus canadensis</i>	50	---	---	---			
	Wild Rye	---	---	12-2	13	On 14th day, 1; 22nd, 1; 133rd, 1	3	6

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	<i>Asclepias cornuti</i> —								
12	Milkweed -----	25	-----	11-11	-----	No seeds germinated -----			
49	Milkweed -----	25	-----	11-26	16	On 17th day, 1; 35th, 1; 37th, 1; 38th, 2; 40th, 1; 62nd, 2 -----	8	16	
	<i>Polygonum pennsylvanicum</i> —								
22	Smartweed -----	50	-----	12-2	-----	No seeds germinated -----			
15	Smartweed -----	50	-----	12-2	-----	No seeds germinated -----			
36	Smartweed -----	50	-----	12-2	-----	No seeds germinated -----			
79	Smartweed -----	50	-----	12-2	-----	No seeds germinated -----			
16	<i>Lepidium apetalum</i> —								
	Pepper-grass -----	50	-----	12-2	5	On 6th day, 15; 7th, 7; 10th, 1; 25th, 1; 67th, 1 -----	25	50	
57.5	Pepper-grass -----	50	-----	12-2	6	On 7th day, 3; 10th, 2; 11th, 2; 13th, 7; 14th, 2 -----	16	32	
84	<i>Lepidium virginicum</i> —								
	Pepper-grass -----	50	-----	12-2	9	On 10th day, 2; 11th, 3; 13th, 2; 16th, 2; 25th, 8; 31st, 2; 35th, 2; 45th, 1; 56th, 1; 82nd, 1 -----	26	52	
19	<i>Capsella bursa-pastoris</i> -----	50	-----	12-2	6	On 7th day, 2; 10th, 1 -----	3	6	
	Shepherd's Purse -----								
27	<i>Sisymbrium officinale</i> —								
	Hedge Mustard -----	50	-----	12-2	4	On 5th day, 16; 6th, 15; 7th, 4; 8th, 15; 10th, 1; 11th, 2; 12th, 1 -----	50	100	
17	<i>Brassica sinapistrum</i> —								
	Mustard -----	50	-----	12-2	3	On 4th day, 22; 5th, 22; 6th, 3; 13th, 1; 14th, 2 -----	50	100	
54	<i>Brassica nigra</i> —								
86	Black Mustard -----	50	-----	11-26	5	On 6th day, 3; 9th, 7; 11th, 2 -----	12	24	
81	Black Mustard -----	50	-----	11-26		No seeds germinated -----			
	<i>Achillea millefolium</i> —								
58	Yarrow -----	50	-----	12-9	6	On 7th day, 14; 11th, 7; 13th, 2; 14th, 1; 34th, 2; 43rd, 1 -----	27	54	
	<i>Arctium lappa</i> —								
50	Burdock -----	50	-----	11-23	12	On 13th day, 1; 17th, 2; 18th, 6; 19th, 1; 31st, 1; 35th, 1 -----	12	24	
	<i>Taraxacum officinale</i> —								
89	Dandelion -----	50	-----	11-11	5	On 6th day, 2; 7th, 5; 10th, 1; 15th, 2 -----	10	20	
29.5	Dandelion -----	50	-----	11-11	6	On 7th day, 4; 8th, 1; 10th, 3; 11th, 8; 13th, 3; 14th, 1; 25th, 1 -----	21	42	
	<i>Sonchus oleracea</i> —								
23	Sow-Thistle -----	50	-----	10-24	5	On 6th day, 1; 7th, 1; 8th, 7; 11th, 2; 12th, 1 -----	12	24	
	<i>Lactuca ludoviciana</i> —								
24	Lettuce -----	50	-----	9-24	-----	No seeds germinated -----			
	<i>Eupatorium purpureum</i> —								
92	Joe Pye Weed -----	50	-----	11-11	15	On 16th day, 3 -----	3	6	
	<i>Lophanthes scrophulariaefo-</i>								
93	<i>lius</i> —Hyssop -----	50	-----	11-11	-----	No seeds germinated -----			
	<i>Bidens frondosa</i> —								
8	Stick-tight -----	50	-----	11-18	-----	No seeds germinated -----			
	Stick-tight -----	50	-----	11-18	180	On 181st day, 1 -----	1	2	
	<i>Verbascum thapsus</i> —								
30	Mullein -----	50	-----	12-2	-----	No seeds germinated -----			
67	Mullein -----	50	-----	12-2	-----	No seeds germinated -----			
	<i>Melilotus alba</i> —								
45	Sweet clover -----	50	-----	12-2	5	On 6th day, 1; 116th, 1 -----	2	4	
	<i>Cassia chamaecrista</i> —								
44	Partridge Pea -----	50	-----	11-26	30	On 31st day, 1; 42nd, 1; 53rd, 1; 116th, 1 -----	4	8	
	<i>Acalypha virginica</i> —								
75	3-seeded Mercury -----	50	-----	12-12	-----	No seeds germinated -----			

VIABILITY OF WEED SEEDS—CONTINUED.

Sample No.	DECEMBER—Continued Name of Plant	No. of seeds	Date of collection	Date of planting	Days dormant	No. of Days Required for Germination	No. of seeds germinating	Per cent of germination
40	<i>Portulaca oleracea</i> —	50		11-18		No seeds germinated		
29	Purslane	50		12-12		No seeds germinated		
77	Purslane	50		12-12		No seeds germinated		
	<i>Oenothera biennis</i> —							
38	Evening Primrose	50		11-18		No seeds germinated		
47	Evening Primrose	50		11-26		No seeds germinated		
59	<i>Verbena urticifolia</i> —							
63	Vervain	50		11-4		No seeds germinated		
	<i>Verbena stricta</i> —							
72	Blue vervain	50		12-2		No seeds germinated		
	Blue vervain	50		12-2		No seeds germinated		
65	<i>Teucrium canadense</i> —							
	Germander	50		12-2		No seeds germinated		
	<i>Monarda fistulosa</i> —							
82	Horsemint	50		12-2	9	On 10th day, 1; 11th, 1; 13th, 6; 14th, 3; 20th, 1; 27th, 2; 29th, 4; 32nd, 1; 57th, 2	21	42
	<i>Nepeta glechoma</i> —							
83	Ground Ivy	50		12-2	24	On 25th, 1; 31st, 1; 45th, 2	4	8
	<i>Plantago major</i> —							
85	Plantain	50		12-9		No seeds germinated		
28	Plantain	50		12-2		No seeds germinated		
88	<i>Datura stramonium</i> —							
	Jimson Weed	50		12-9		No seeds germinated		
	<i>Polanisia trachysperma</i> —							
91	Polanisia	50		12-9	8	On 9th day, 1	1	2

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VIABILITY OF WEED SEEDS—CONTINUED.

Sample No.	JANUARY Name of Plant	No. of seeds	Date of collection	Date of planting	Days dormant	No. of Days Required for Germination	No. of seeds germinating	
							No. of seeds germinating	Per cent of germination
1	<i>Rumex crispus</i> — Curled Dock	50	-----	1-5	-----	No seeds germinated	-----	-----
18	Curled Dock	50	-----	1-6	-----	No seeds germinated	-----	-----
2	<i>Chenopodium album</i> — Pigweed	50	-----	1-5	-----	No seeds germinated	-----	-----
20	Pigweed	50	-----	1-6	9	On 10th day, 1; 13th, 2	3	6
32	Pigweed	50	-----	1-5	8	On 8th day, 1	1	2
43	Pigweed	50	-----	1-5	-----	No seeds germinated	-----	-----
35	<i>Amarantus retroflexus</i> — Green Pigweed, Tumbleweed	50	-----	1-5	-----	No seeds germinated	-----	-----
21	Green Pigweed, Tumbleweed	50	-----	1-6	12	On 13th day, 1; 14th, 1	2	4
42	Green Pigweed, Tumbleweed	50	-----	1-5	85	On 86th day, 1	1	2
53	Green Pigweed, Tumbleweed	50	-----	1-5	7	On 8th day, 1	1	2
69	Green Pigweed, Tumbleweed	50	-----	1-6	6	On 7th day, 1	1	2
80	Green Pigweed, Tumbleweed	50	-----	1-6	8	On 9th day, 1; 10th, 1; 11th, 1; 14th, 3	6	12
6	<i>Amarantus blitoides</i> — Amaranth	50	-----	1-5	-----	No seeds germinated	-----	-----
9	<i>Ambrosia artemisiifolia</i> — Hog-weed	50	-----	1-5	42	On 43rd day, 1; 104th, 1	2	4
34	Hog-weed	50	-----	1-6	-----	No seeds germinated	-----	-----
11	<i>Ambrosia trifida</i> — Ragweed	50	-----	1-5	-----	No seeds germinated	-----	-----
46	Ragweed	25	-----	1-5	15	On 16th day, 1; 29th, 1; 83rd, 1; 86th, 1	4	16
4	<i>Setaria glauca</i> — Yellow Foxtail	50	-----	1-6	84	On 85th day, 1	1	2
25	Yellow Foxtail	50	-----	1-5	11	On 12th day, 3; 27th, 1	4	8
56	Yellow Foxtail	50	-----	1-5	9	On 10th day, 2; 14th, 1	3	6
5	<i>Setaria viridis</i> — Green Foxtail	50	-----	1-5	7	On 8th day, 6; 14th, 2; 24th, 1	9	18
33	Green Foxtail	50	-----	1-5	5	On 6th day, 10; 9th, 11; 10th, 8; 12th, 1	30	60
55	Green Foxtail	50	-----	1-5	13	On 14th day, 1	1	2
48	<i>Panicum capillare</i> — Old Witch-Grass	50	-----	1-5	-----	No seeds germinated	-----	-----
7	Old Witch-Grass	50	-----	1-5	-----	No seeds germinated	-----	-----
57	Old Witch-Grass	50	-----	1-5	13	On 14th day, 2; 23rd, 3; 24th, 1; 31st, 1; 34th, 2; 41st, 1	10	20
10	<i>Panicum crus-galli</i> — Barnyard Grass	50	-----	1-5	-----	No seeds germinated	-----	-----
81	<i>Elymus canadensis</i> — Wild Rye	50	-----	1-6	13	On 14th day, 2; 27th, 3; 28th, 1; 29th, 2; 30th, 1	9	18

VIABILITY OF WEED SEEDS—CONTINUED.

Sample No.	JANUARY—Continued Name of Plant	No. of seeds	Date of col- lection	Date of planting	Days dor- mant	No. of Days Required for Germination	No. of seeds germinating	
							Per cent of germination	
78	<i>Agropyrum tenerum</i> — Couch-grass	25		1-6	5	On 6th day, 1; 7th, 8; 8th, 3; 12th, 6; 16th, 5; 46th, 1	24	96
	<i>Asclepias cornuti</i> —							
12	Milkweed	50		1-5				
49	Milkweed	50		1-5	11	On 12th day, 1	1	2
	<i>Polygonum pennsylvanicum</i> —							
22	Smartweed	50		1-6	15	On 16th day, 1	1	2
15	Smartweed	50		1-5				
36	Smartweed	50		1-5				
79	Smartweed	50		1-6				
	<i>Lepidium apetalum</i> —							
16	Peppergrass	50		1-6	5	On 6th day, 9; 7th, 7; 8th, 1; 9th, 1; 91st, 2	20	40
57.5	Peppergrass	50		1-6	5	On 6th day, 1; 7th, 3; 8th, 1; 10th, 3; 15th, 8	16	32
	<i>Lepidium virginicum</i> —							
84	Peppergrass	50		1-6				
	<i>Capsella bursa-pastoris</i> —							
19	Shepherd's Purse	50		1-5	4	On 5th day, 1; 118th, 1; 128th, 1	3	6
	<i>Sisymbrium officinale</i> —							
27	Hedge Mustard	50		1-5	4	On 5th day, 5; 6th, 2; 7th, 3; 10th, 2	12	24
	<i>Brassica sinapistrum</i> —							
17	Mustard	50		1-5	3	On 4th day, 41; 5th, 3; 6th, 2	46	92
	<i>Brassica nigra</i> —							
54	Mustard	50		1-5	3	On 4th day, 2; 6th, 2	4	8
86	Mustard	50		1-6				
	<i>Achillea millefolium</i> —							
58.5	Yarrow	50		1-5	5	On 6th day, 12; 7th, 2; 10th, 2; 54th, 1	17	34
	<i>Arctium lappa</i> —							
50	Burdock	25		1-5				
	<i>Taraxacum officinale</i> —							
20.5	Dandelion	50		1-5	5	On 6th day, 2; 7th, 4; 8th, 9; 9th, 7; 10th, 5; 13th, 6	33	66
	<i>Eupatorium purpureum</i> —							
92	Joe Pye Weed	50		1-6	9	On 10th day, 2	2	4
	<i>Lophanthus scrophulariaefo- lius</i> —Giant Hyssop	50		1-6				
93		50		1-6				
	<i>Bidens frondosa</i> —							
8	Stick-tight	50		1-5				
31	Stick-tight	50		1-5				
	<i>Verbascum thapsus</i> —							
30	Mullein	50		1-5				
67	Mullein	50		1-5				

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44	<i>Cassia chamaecrista</i> — Partridge Pea	25	1-5	54	On 55th day, 1; 56th, 1; 57th, 1	3	12
75	<i>Acalypha virginica</i> — 3-seeded Mercury	50	1-6				
40	<i>Portulaca oleracea</i> — Purslane	50	1-5				
29	Purslane	50	1-5				
77	Purslane	50	1-5	12	On 13th day, 3	3	0
	<i>Oenothera biennis</i> — Evening Primrose	50	1-6				
47	Evening Primrose	50	1-5				
	<i>Verbena urticifolia</i> — Wild Verbena	50	1-5				
59	Wild Verbena	50	1-5				
	<i>Verbena stricta</i> — Blue Vervain	50	1-6				
63	Blue Vervain	50	1-6				
72		50	1-6				
	<i>Teucrium canadense</i> — Germander	50	1-5				
65	Germander	50	1-5				
	<i>Monarda fistulosa</i> — Horse-mint	50	1-6	6	On 7th day, 1; 8th, 3; 9th, 2; 10th, 3	9	12
32	Horse-mint	50	1-6				
	<i>Nepeta glechoma</i> — Ground Ivy	50	1-6				
83	Ground Ivy	50	1-6				
	<i>Plantago major</i> — Plantain	50	1-6				
85	Plantain	50	1-6				
28	Plantain	50	1-5				
	<i>Datura stramonium</i> — Jimson-weed	50	1-6				
88	Jimson-weed	50	1-6				
	<i>Polanisia trachysperma</i> — Polanisia	50	1-6				
91	Polanisia	50	1-6				
	<i>Chenopodium album</i> — Lamb's Quarter	50	1-5				
2	Lamb's Quarter	50	1-5				
20	Lamb's Quarter	50	1-6				
32	Lamb's Quarter	50	1-6				
43	Lamb's Quarter	50	1-5				



VIABILITY OF WEED SEEDS—CONTINUED.

Sample No.	FEBRUARY Name of Plant	No. of seeds	Date of col- lection	Date of planting	Days dor- mant	No. of Days Required for Germination	No. of seeds germinating Per cent of germination	
1	<i>Rumex crispus</i> — Curled Dock -----	50	-----	2-9	76	On 77th day, 1.....		
18	Curled Dock -----	50	-----	2-10	31	On 32nd day, 3; 64th, 1.....		
	<i>Chenopodium album</i> —							
2	Lamb's Quarter -----	50	-----	2-9				
20	Lamb's Quarter -----	50	-----	2-10	12	On 13th day, 1; 25th, 1; 62nd, 1.....		
32	Lamb's Quarter -----	50	-----	2-9				
43	Lamb's Quarter -----	50	-----	2-9				
73	Lamb's Quarter -----	50	-----	2-10				
	<i>Amarantus retroflexus</i> —							
35	Pigweed -----	50	-----	2-9				
21	Pigweed -----	50	-----	2-10	38	On 39th day, 2 41st, 1.....		
53	Pigweed -----	50	-----	2-9	25	On 93th day, 2.....	2	4
69	Pigweed -----	50	-----	2-10		On 26th day, 2.....		
80	Pigweed -----	50	-----	2-10				
	<i>Amarantus blitoides</i> —							
6	Pigweed -----	50	-----	2-9				
	<i>Ambrosia artemisiaefolia</i> —							
9	Hogweed -----	50	-----	2-9	58	On 50th day, 1.....		
24	Hogweed -----	50	-----	2-9	25	On 26th day, 1; 41st, 1; 47th, 1; 48th, 1; 49th, 2; 59th, 1; 78th, 1.....		
	<i>Ambrosia trifida</i> —							
11	Ragweed -----	50	-----	2-9				
46	Ragweed -----	50	-----	2-9				
	<i>Setaria glauca</i> —							
4	Yellow Foxtail -----	50	-----	2-9	75	On 76th day, 3; 82nd, 1; 29th, 5; 39th, 1.....		
25	Yellow Foxtail -----	50	-----	2-10	24	On 25th day, 3; 30th, 5; 39th, 1.....		
56	Yellow Foxtail -----	50	-----	2-9	20	On 21st day, 2; 29th, 4.....		
	<i>Setaria viridis</i> —							
5	Green Foxtail -----	50	-----	2-9	11	On 12th day, ..... On 12th day, 12; 13th, 9; 16th, 2.....		
33	Green Foxtail -----	50	-----	2-9	11			
55	Green Foxtail -----	50	-----	2-9	81			
	<i>Panicum capillare</i> —							
48	Old Witch Grass -----	50	-----	2-9				
7	Old Witch Grass -----	50	-----	2-9	73	On 74th day, 1; 76th, 3.....	4	8
57	Old Witch Grass -----	50	-----	2-9				
	<i>Panicum crus-galli</i> —							
10	Barnyard Grass -----	50	-----	2-9	97	On 9th day, 2.....	2	4
	<i>Elymus robustus</i> —							
81	Wild Rye -----	50	-----	2-9				

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78	<i>Agropyrum tenerum</i> — Quack Grass	50	2-10	18	On 19th day, 1; 21st, 4; 28th, 1; 78th, 1	7	14
72	<i>Asclepias cornuti</i> — Milkweed	50	2-9	25	On 26th day, 1; 27th, 1; 29th, 1; 31st, 2	5	10
49	Milkweed						
94	<i>Veronica virginica</i> — Culver's Root	50	2-9	25	On 26th day, 1; 40th, 1; 82nd, 1	3	6
74	<i>Abutilon avicennae</i> — Velvet Leaf	50	2-10				
22	<i>Polygonum pennsylvanicum</i> — Smartweed	50	2-10				
15	Smartweed	50	2-10				
36	Smartweed	50	2-9				
79	Smartweed	50	2-9				
16	<i>Leptidium apetalum</i> — Peppergrass	50	2-10	12	On 13th day, 16; 19th, 1; 42nd, 2; 44th, 4	23	46
57.5	Peppergrass	50	2-9				
19	<i>Capsella bursa-pastoris</i> — Shepherd's Purse	50	2-10	31	On 31st day, 1	1	2
27	<i>Sisymbrium officinale</i> — Hedge Mustard	50	2-10	7	On 8th day, 1 13th, 3	4	8
17	<i>Brassica sinapistrum</i> — Mustard	50	2-10	7	On 8th day, 36	36	72
54	<i>Brassica nigra</i> — Mustard	50	2-10				
	Mustard	50	2-10				
58	<i>Achillea millefolium</i> — Yarrow	50	2-9	20	On 21st day, 1; 82nd, 3	4	8
50	<i>Arctium lappa</i> — Burdock	50	2-9	28	On 29th day, 1	1	2
29.5	<i>Taraxacum officinale</i> — Dandelion	50	2-10	24	On 25th day, 1; 30th, 1; 32nd, 1; 39th, 2	5	10
92	<i>Eupatorium purpureum</i> — Joe-Pye Weed	50	2-10				
	<i>Lopanthus scrophulariaefolia</i> Giant Hyssop	50	2-10				
8	<i>Bidens frondosa</i> — Stick-tight	50	2-9	97	On 98th day, 4	4	8
31	Stick-tight	50	2-9				
30	<i>Verbascum thapsus</i> — Mullein	50	2-9				
45	<i>Melilotus alba</i> — Sweet Clover	50	2-9				
44	<i>Cassia chamaecrista</i> — Partridge Pea	50	2-9				
75	<i>Acalypha virginica</i> — 3-seeded Mercury	50	2-9				
40	<i>Portulaca oleracea</i> — Purslane	50	2-9				
29	Purslane	50	2-9				
77	Purslane	50	2-9				

VIABILITY OF WEED SEEDS—CONTINUED.

Sample No.	FEBRUARY—Continued Name of Plant	No. of seeds	Date of col- lection	Date of planting	Days dor- mant	No. of Days Required for Germination	No. of seeds germinating	
							No. of seeds germinating	Per cent of germination
38	<i>Oenothera biennis</i> — Evening Primrose -----	50	-----	2-9	-----	-----	-----	-----
47	Evening Primrose ----- <i>Verbena urticifolia</i> —	50	-----	2-9	-----	-----	-----	-----
59	Wild Verbena ----- <i>Verbena stricta</i> —	50	-----	2-9	-----	-----	-----	-----
63	Vervain -----	50	-----	2-10	-----	-----	-----	-----
72	Vervain -----	50	-----	2-10	-----	-----	-----	-----
65	<i>Teucrium canadense</i> — Germander -----	50	-----	2-9	-----	-----	-----	-----
82	<i>Monarda fistulosa</i> — Horse-mint -----	50	-----	2-10	-----	-----	-----	-----
23	<i>Plantago major</i> — Plantain -----	50	-----	2-10	23	On 29th day, 1	1	2
83	<i>Datura stramonium</i> -----	50	-----	2-10	-----	-----	-----	-----
91	<i>Polanisia trachysperma</i> —	50	-----	2-10	-----	-----	-----	-----

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VIABILITY OF WEED SEEDS—CONTINUED.

No	MARCH Name of Plant	No. of seeds	Date of col- lection	Date of planting.	Days dor- mant	No. of Days Required for Germination	No. of seeds germinating	Per cent of germination
1	<i>Rumex crispus</i> — Curled Dock	50	---	3-10	14	On 15th day, 2	2	4
	Curled Dock	50	---	3-11	---	-----	---	---
85	<i>Chenopodium album</i> — Pigweed or Lamb's Quarter	50	---	3-10	10	On 11th day, 1	1	2
	Pigweed or Lamb's Quarter	50	---	3-11	9	On 10th day, 1; 13th, 1; 18th, 4	7	14
	Pigweed or Lamb's Quarter	50	---	3-10	9	On 10th day, 1	1	2
	Pigweed or Lamb's Quarter	50	---	3-10	4	On 5th day, 1; 18th, 3	4	8
	Pigweed or Lamb's Quarter	50	---	3-11	---	-----	---	---
	-----	-----	-----	-----	-----	-----	-----	-----
85	<i>Amarantus retroflexus</i> — Green Pigweed	50	---	3-10	11	On 12th day, 1; 18th, 2	3	6
	Green Pigweed	50	---	3-11	9	On 10th day, 6; 17th, 5; 21st, 1	12	24
	Green Pigweed	50	---	3-10	11	On 12th day, 6; 21st, 3	9	18
	Green Pigweed	50	---	3-10	16	On 17th day, 2	2	4
	Green Pigweed	50	---	3-10	16	On 17th day, 1	1	2
	Green Pigweed	50	---	3-10	8	On 9th day, 1; 10th, 2; 17th, 1	4	8
	-----	-----	-----	-----	-----	-----	-----	-----
85	<i>Amarantus blitoides</i> — Pigweed	50	---	3-10	37	On 38th day, 1	1	2
	-----	-----	-----	-----	-----	-----	-----	-----
85	<i>Ambrosia artemisiaefolia</i> — Ragweed	50	---	3-10	23	On 24th day, 1	1	2
	Ragweed	50	---	3-10	19	On 19th day, 1	1	2
85	<i>Setaria glauca</i> — Yellow Foxtail	50	---	3-10	12	On 13th day, 1; 15th, 4; 17th, 12; 23rd, 2; 25th, 1	20	40
	Yellow Foxtail	50	---	3-10	10	On 11th day, 27; 12th, 12; 17th, 5; 21st, 1	13	26
	Yellow Foxtail	50	---	3-10	13	On 14th day, 1 17th, 2; 21st, 5; 23rd, 2	45	90
85	<i>Setaria viridis</i> — Green Foxtail	50	---	3-10	9	On 10th day, 26 12th, 6	32	64
	Green Foxtail	50	---	3-10	10	On 11th day, 1; 19th, 1; 23rd, 1	3	6
85	<i>Panicum capillare</i> — Old Witch Grass	50	---	3-10	---	-----	---	---
	Old Witch Grass	50	---	3-10	---	-----	---	---
	Old Witch Grass	50	---	3-10	---	-----	---	---
85	<i>Panicum crus-galli</i> — Barnyard Grass	50	---	3-10	---	-----	---	---
	-----	-----	-----	-----	-----	-----	-----	-----
85	<i>Elymus canadensis</i> — Wild Rye	50	---	3-11	9	On 10th day, 1; 28th, 1	2	4
	-----	-----	-----	-----	-----	-----	-----	-----
85	<i>Asclepias cornuti</i> — Milkweed	50	---	3-10	---	-----	---	---
	Milkweed	50	---	3-10	---	-----	---	---

VIABILITY OF WEED SEEDS—CONTINUED.

Sample No.	MARCH—Continued Name of Plant	No. of seeds	Date of collection	Date of planting	Days dormant	No. of Days Required for Germination	No. of seeds germinating	
							No. of seeds germinating	Per cent of germination
71	<i>Ambrosia trifida</i> —	20	-----	3-10	51	On 52nd day, 1.....	1	5
46	Hogweed -----	25	-----	3-10	10	On 11th day, 1; 15th, 2; 21st, 6; 24th, 1; 39th, 2; 53th, 1.....	13	28
94	<i>Veronica virginica</i> —	50	-----	3-11	56	On 57th day, 1.....	1	2
74	<i>Abutilon avicennae</i> —	50	-----	3-10	8	On 9th day, 1; 10th, 1; 28th, 1.....	3	6
22	<i>Polygonum pennsylvanicum</i> —	50	-----	3-10	-----	-----	-----	-----
15	Smartweed -----	50	-----	3-9	-----	-----	-----	-----
36	Smartweed -----	50	-----	3-10	-----	-----	-----	-----
79	Smartweed -----	50	-----	3-11	-----	-----	-----	-----
78	<i>Agropyrum tenerum</i> —	50	-----	3-11	16	On 17th day, 10; 20th, 5; 22nd, 2; 45th, 1.....	18	36
84	<i>Lepidium virginicum</i> —	50	-----	3-11	9	On 10th day, 11; 28th, 1; 35th, 1; 48th, 1.....	14	28
16	<i>Lepidium apetalum</i> —	50	-----	3-10	9	On 10th day, 33.....	33	66
67.5	Pepper-grass -----	50	-----	3-10	1.	On 12th day, 5; 17th, 1; 22nd, 2; 27th, 3; 29th, 1; 67th, 1.....	13	26
19	<i>Capsella bursa-pastoris</i> —	50	-----	3-10	9	On 10th day, 1; 21st, 1.....	2	4
27	Shepherd's Furse -----	50	-----	3-10	4	On 5th day, 1; 10th, 10.....	11	22
17	<i>Brassica sinapistrum</i> —	50	-----	3-10	3	On 4th day, 41; 7th, 6.....	47	94
54	<i>Brassica nigra</i> —	50	-----	3-10	10	On 11th day, 4.....	4	8
86	Mustard -----	50	-----	3-11	8	On 9th day, 1.....	1	2
58	<i>Achillea millefolium</i> —	50	-----	3-11	13	On 14th day, 1; 67th, 3.....	4	8
50	<i>Arctium lappa</i> —	50	-----	3-10	21	On 22nd day, 1; 24th, 1.....	2	4
89	Burdock -----	50	-----	3-11	9	On 10th day, 8; 11th, 3.....	11	22
92	<i>Taraxacum officinale</i> —	50	-----	3-11	-----	-----	-----	-----
93	Dandelion -----	50	-----	3-11	-----	-----	-----	-----
8	<i>Eupatorium purpureum</i> —	50	-----	3-11	-----	-----	-----	-----
31	Joe Pye Weed -----	50	-----	3-11	-----	-----	-----	-----
	<i>Lophanthus schophularia folius</i>	50	-----	3-11	-----	-----	-----	-----
	Giant Hyssop -----	50	-----	3-11	-----	-----	-----	-----
	<i>Bidens frondosa</i> —	50	-----	3-11	-----	-----	-----	-----
	Stick-tight -----	50	-----	3-11	-----	-----	-----	-----
	Stick-tight -----	50	-----	3-11	-----	-----	-----	-----

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30	<i>Verbascum thapsus</i> — Mullein	50	3-10				
45	<i>Melilotus alba</i> — Sweet Clover	50	3-10				
75	<i>Acalypha virginica</i> — Giant Hyssop	50	3-10	11	On 12th day, 1	1	2
40	<i>Portulaca oleracea</i> — Purslane	50	3-10				
29	Purslane	50	3-10				
77	Purslane	50	3-10				
38	<i>Oenothera biennis</i> — Evening Primrose	50	3-10				
47	Evening Primrose	50	3-10				
59	<i>Verbena urticifolia</i> — Wild Verbena	50	3-10	14	On 15th day, 2	2	4
63	<i>Verbena stricta</i> — Verbena stricta	50	3-10				
72	Verbena stricta	50	3-10				
65	<i>Teucrium canadense</i> — Germander	50	3-10				
82	<i>Monarda fistulosa</i> — Horsemint	50	3-10	9	On 10th day, 1; 17th, 2; 19th, 1; 44th, 1; 46th, 2	7	14
28	<i>Plantago major</i> — Plantain	50	3-10	55	On 56th day, 1	1	2
88	<i>Datura stramonium</i> — Jimson-weed	50	3-11				
91	<i>Polanisia trachysperma</i> — Polanisia	50	3-11				