(B) Temp seedlings 37°F +

Exp	Date	°F	Hrs		Result
			1 hrs		
	Jan 12	1971	122		0% roots killed, hypos live
A,k 2	Mar 30	1970	113	Sus Sum	100% slight abnorm
A,k 1	Mar 31	1970	113	Sus Sum	100% perfectly normal
			2 hrs		
	Jan 12	1971	122		0% roots killed. hypos live
			16 hrs		
A,k 2	Mar 30	1970	113		Lethal.
A,k 1	Mar 31	1970	113		100% perfectly normal

Temp Germ seed 104°F

Exp.	Date	Result
A, k (A)	1hr Jan 19 1970	100% but slightly abn.
A, k (B)	4hrs Jan 19 1970	100% nearly normal
A, k (C)	24hrs	0% All grow but abnorm.

Temp Germ seed 113°F

Exp.	Date	Result
	1hr	
A L (A) (3)	Jan 13 1970	0% Abnorm. prob gr. soil
A k1	Mar 31 1970	100%
A k2	Mar 30 1970	77%
	4hrs	
A L (B)	Jan 13 1970	0% Abnor. prob gr soil
	16hrs	
A k1	Mar 31 1971	0% slight abnormal
A k2	Mar 30 Apr. 1 1970	Lethal

Temp Germ Seed 172°F

Exp	Date	Result
A, k, 3	Mar 28 1970 1hr	0% border lethal
A, m (A)	Jan 24 1970	6% " "
A, k, 3	Mar 28 1970 7hrs	0% border lethal
A, m (B)	Jan 24 1970 4hrs	Lethal No growth

Temp Germ Seed 131°F

Exp	Date	Result
A,k 4	1hr March 27 1970 Jan 3 1971	Lethal No growth Lethal
	2hrs Jan 3 1971	Lethal

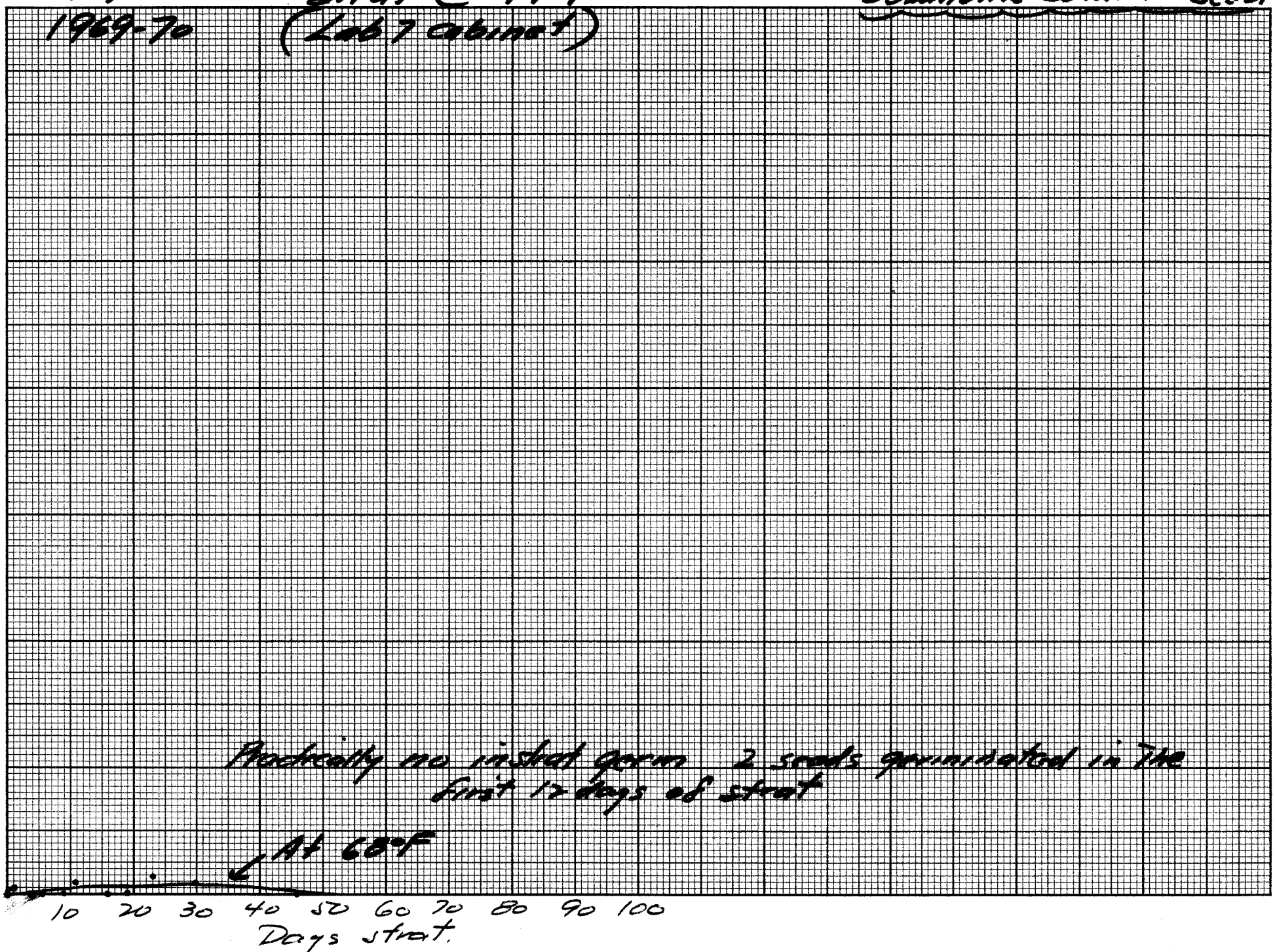
(A) Temp Strat Seed (Tips)

Exp	Date	Time	Result
		11°F	
	Jan 10 1970	2hrs	13%
		13°F	
E. b(1)	Febr 5	1hr	63%
		14°F	
	Aug 26 1970	1hr	45%
		2hrs	72%
		18°F	
Plastic cups	Jan 6 1970	1hr	59%
Plastic bags	" "	20hrs	Lethal
		19°F	
E	Aug 24 1970	1hr	79%
	" "	4hrs	80%
E, b(1)	Febr 3 "	1hr	85%
		24°F	
E	Aug 20 1970	16hrs	75%
	" "	24hrs	79%
	Aug 19 "	1hr	84%
	" "	3hrs	78%
	" "	19hrs	91%

A, h 2-70 Strat @ 77°F

Susanville Summit Seed

1969-70 (Lab Cabinet)



Exp A.h Stratification @ 77°F Refrig Path Lab 1969-70

Sus. Sum Seed

Started Dec 27 1969

Sample No	Date of sample	Strat days	No of viable seeds	Growth in 7 days @ 68°F Tips %	Germination @ 68°F %	In strat %
1	Dec 28'69	1	106	No record	1	0
2	" 31	4	119	13	0	0
3	Jan 2'70	6	124	36	0	0
4	" 5	9	102	35	0	0 [1]
5	" 8	12	110	37	2	0 [2]
6	" 12	16	97	35	0	0
7	" 15	19	115	37	0	0
8	" 19	23	97	40	3	1
9	" 26	30	100	54	2	2
10	Febr 11	46	88	54	0	0
11	End	Total	1058			

[1] These no doubt germinated in the first 12 days probably first 6

Exp A, h (1)

No 6(6) Exp 2-70 Start @ 77°F

Date	Time	Sample No	Germ days	Tips No	Tips Cum	Tips %	Germination No	Germination Cum	Germination %	Days Start
Dec 28	9:00 AM	(1) Oct	0	(105)	(106)		0	0	0	0 (1)
29			1				1	1	1	
30			2				0	1	1	
31			3				0	1	1	One
Jan 1			4				0	1	1	Germinate
2			5				0	1	1	4
3			6				0	1	1	
4			7	(End)			0	1	1	1%
Dec 31	9:00A	(2) Oct	0	(119)	(119)		0	0	0	0 (4)
Jan 1	" "		1				0	0	0	
2			2				0	0	0	
3			3				0	0	0	
4			4				0	0	0	
5			5	3	3		0	0	0	
6			6	5	8		0	0	0	
7			7	7	15	13%	0	0	0%	
				(End)						
Jan 2	9:00A	(3) Oct	0	(126)	(124)		0	0	0	0 (6)
3			1				0	0	0	
4			2				0	0	0	
5			3	22+	22		0	0	0	
6			4	8	30		0	0	0	
7			5	10	40		0	0	0	
8			6	4	44		0	0	0	
9			7	1	45	36%	0	0	0%	
				(End)						

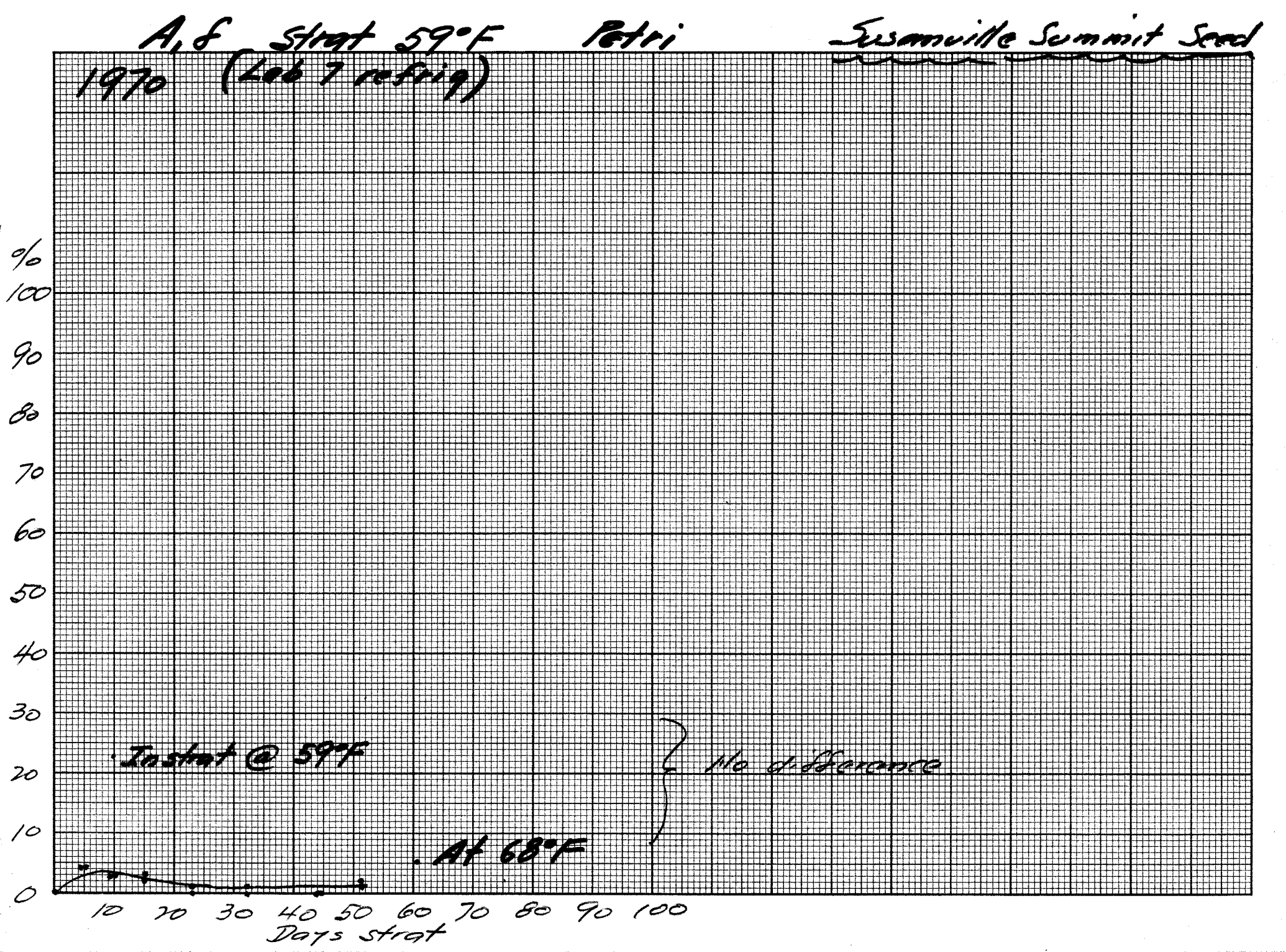
Exp A, b (2)

No 6(6) Exp 2-70 Strat @ 77°F Cont'd

Date	Time	Germination time Days	Hrs	Tips No	Tips Cum	Tips %	Germination No	Germination Cum	Germination %	Strat Days
	Sample	(4)		(103)	(107)					
Jan 5	1970 9:30	out	0	10+	10		0	0	0	(9)
6	" 9:30	1.0		6	16		0	0	0	
7		2		no record						
8		3		4	20		0	0	0	
9	10:30	4		10	30		0	0	0	
10		5		5	35		0	0	0	
11	8:30	6		0	35		0	0	0	
12	9:00	7		1	36	35%	6	0	0% (End)	
	Sample	(5)		(110)	(110)					
Jan 8	10:30	out	0	17	17		0	0	0	(12)
9	10:30	1		12	29		0	0	0	
10	11:30	2		4	33	supply	1	1		
11	8:30	3		1	34		1	2		
12	9:00	4		2	36		0	2	0	
13	8:15	5		1	37		0	2		
14	9:00	6		3	40	37%	0	2		
15	9:00	7		1	41	(End)	0	2	2%	
	Sample	(6)		(98)	(97)					
Jan 12	9:00A	out		24	24		0	0	0	(16)
" 13	8:15A	1		2	26		0	0	0	
14	9:00A	2		1	27		0	0	0	
15	9:00A	3		2	29		0	0	0	
16	9:00A	4		3	32		0	0	0	
17	" "	5		2	34		0	0	0	
18	" "	6		0	34	35%	0	0	0	
19	12:30	7		0	34	(End)	0	0	0%	
	Sample	(7)		(115)	(115)					
Jan 15	9:00A	0	out	25	25		0	0	0	(19)
Jan 16	11:30A	1		5	30		0	0	0	
" 17	9:00A	2		2	32		0	0	0	
" 18	" "	3		2	34		0	0	0	
" 19	12:30P	4		3	37		0	0	0	
20	8:00A	5		4	41		0	0	0	
21	7:30A	6		1	42	37%	0	0	0	
22	8:30A	7		1	43	(End)	0	0	0%	

Experiment A, b Strat @ 77°F (3)

Date	Time of day		Germ. time (days)	No.	Tips Cum.	%		Germination No.	Cum.	%	Strat. No. of days
	Sample	(8)		97	97 V						(23)
Jan 19	12:30P	out	0	31	31		2" long	1	1	1	(26)
20	8:00A		1	5	36			1	2		
21	7:30A		2	1	37			1	3		
22	8:30A		3	1	38			0	3		
23	11:00A		4	1	39			0	3		
24	8:30A		5	0	39			0	3		
25	7:15A		6	0	39			0	3		
26	7:25A		7	0	39	40%		0	3	3%	
	Sample	(9)		102	100 V				(End)		
Jan 26	7:30A	out	0	38	38			2	2	← 2 to 3" long	
27	7:40A		1	7	45			0	2	2	30
28	7:30A		2	0	45			0	2		
29	8:20A		3	0	45			0	2		
30	8:00A		4	9	54			0	2		
31	7:15A		5	0	54			0	2		
Febr 1	8:00A		6	0	54			0	2		
2	7:00A		7	0	54	54%		0	2	2%	End
Last →	Sample	(10)		89	88 V		← Last sample				
Febr. 11	8:40A	out	0	44	44			0	0	0	
12	8:00A		1	0	44			0	0		(46)
13	8:00A		2	2	46			0	0		
14	7:00A		3	0	46			0	0		
21	4:30P		#10	3	49	54% in 7 days		0	0	0%	
			5					(End)			
			6								
			7								
	Sample	(11)		( )	( )						
		out	0								
			1								
			2								
			3								
			4								
			5								
			6								
			7								


A, f Strat 59°F Petri
Swansville Summit Seed
1970 (Lab 7 refrig)
%
100
90
80
70
60
50
40
30
20
10
0
Instrat @ 59°F
No difference
At 68°F
10 20 30 40 50 60 70 80 90 100
Days strat

Petri

Exp A, E Strat @ 59°F Redfig Path Lab 1970

Jos Sem seed

Jan 9 10:00A Seed into 59°F after 3 days seat in lab

Sample No	Date of sample 1970	No of days strat	No of viable seeds	Growth in 7 days @ 68°F Tips %	Germination %	In strat
1	Jan 14	5	113	31	4	4
2	19	10	116	34	3	3
3	24	15	112	33	3	2
4	31	22	103	40	1	0
5	Febr. 10	32	136	50	1	0
6	" 22	44	105	47	0	0
7	Mar 1	51	118	65	2	1

End

Experiment A, S Strat @ 59°F (1) Sus. Summit

Jan 9 10:00A Seed into strat after 3 days soak (0)

Date 1970	Time of day		Germ. time (days)	Tips No.	Tips Cum.	Tips %	Germination No.	Germination Cum.	Germination %	Strat. No. of days
	Sample	(1)		(114)	(113 V)					
Jan 14	10:00A	out	0	11	11		4	4	4%	(5)
15	9:00A		1	7	18		0	4		
16	11:15A		2	13	31		0	4		
17	9:00A		3	0	31		0	4		
18	9:00A		4	1	32		0	4		
19	12 noon		5	3	35		0	4		
20	8:00A		6	0	35		0	4		
21	7:15A		7	0	35	31%	0	4	4%	End
	Sample	(2)		(118)	(116 V)					
Jan 19	12 noon	out	0	31	31		3	3	3%	(10)
20	8:00A		1	3	34		0	3		
21	7:20A		2	1	35		0	3		
22	8:20A		3	0	35		0	3		
23	11:00A		4	5	40		0	3		
24	8:20A		5	0	40		0	3		
25	8:00A		6	0	40		0	3		
26	8:00A		7	0	40	34%	0	3	3%	End
	Sample	(3)		(114)	(112 V)					
Jan 24	8:20A	out	0	15	15		2	2	2%	(15)
25	←		1	No record			–	–	→	
26			2	2	17		1	3		
27			3	3	20		0	3		
28			4	0	20		0	3		
29	8:15A		5	0	20		0	3		
30	8:15A		6	17	37		0	3		
31	7:00A		7	0	37	33%	0	3	3%	
	Sample	(4)		(104)	(103 V)		(End)			
Jan 31	7:00A	out	0	22	22		0	0	0%	(22)
Feb 1	7:50A		1	0	22		0	0		
2	7:00A		2	1	22		0	0		
3	8:15A		3	0	22		0	0		
4	8:00A		4	8	30		0	0		
5	7:40A		5	11	41		1	1		
6	7:15A		6	0	41		0	1		
7	7:00A		7	0	41	40%	0	1	1%	
							(End)			

Experiment A, f Strat @ 59°F (2)

Date	Time of day		Germ. time (days)	Tips No.	Tips Cum.	Tips %		Germination No.	Germination Cum.	Germination %	Strat. No. of days
	Sample	(5)		(138)	(136 V)						
Febr 10	6:50A	out	0	25	25			0	0	0%	32
11	8:40A		1	3	28			0	0	0	
12	8:00A		2	8	36			0	0	0	
13	7:45A		3	12	48			1	1		
14	7:00A		4	2	50			0	1		
21	4:30P		11	18	68	50%		1	1	1%	
									(End)		
	Sample	(6)		(106)	(105 V)						
Febr. 22	11:00A	out	0	34	34			0	0	0%	44
" 23	8:50A		1	0	34			0	0	0	
27	11:50A		5	8	42			0	0	0	
Mar 1			7	7	49	47%		0	0	0%	
									(End)		
Last	Sample	(7)		(119)	(118 V)						
March 1	9:00A	out	0	60	60		3" long	1	1	1%	
2	9:00A		1	0	60			0	1		51
3	9:00A		2	4	64			0	1		
5	8:30A		4	7	73			0	1		
6	8:30A		5	2	75			1	2		
7	9:00A		6	0	76	-11		0	2		
8	9:00A		7	0	76			0	2	2%	
									(End)		
	Sample			( )	( )						
		out	0								
			1								
			2	Test completed							
			3								
			4								
			5								
			6								
			7								

Summary

Exp A, e Strat @ 55°F Refrig Cold Room Ante

Jan 12 Seed into 55°F strat (H₂O bath) after 20 hrs soaking Lab

Sample No	Date sample taken 1970	No of days strat	No of viable seeds	Growth in 7 days @ 68°F Tips %	Germination %	In strat
1	Jan 16	4	96	20	4	0
2	" 21	9	93	20	2	1
3	" 26	14	115	10	3	2
4	" 31	19	76	8	1	1
5	Febr 6	25	58	9	2	2
6	" 13	32	80	10	1	1
7	Mar 1	48	64	72	0	0
Last 8	Mar 10	57	60	31	3	1

(End)

Exp A, e ①

No 22 17-70 Start @ 55°F

Sus. Summit 1969 Seed

Date	Time	Germ-time	Tips No	Tips Cum	%		Germination No	Germination Cum	%	Start
1970		Days								days
Jan 12	10:30A	Seeds into start. addn 20hr soaking in kb								
		Sample ①		(96V)						
Jan 16	11:00A	out 0	2	2			0	0	0%	④
" 17	9:00A	1	2	4			0	0	0	
" 18	8:45A	2	7	11		Tips	3	3		
19	12:00 noon	3	1	12		"	1	4		
20	8:00AM	4	0	12			0	4		
21	7:00AM	5	3	15			0	4		
22	8:00AM	6	4	19			0	4		
23	11:00A	7	0	19	20%	(End)	0	4	4%	
		Sample ②	(94)	(93V)						
Jan 24	7:10AM	0	8	8			1	1	1%	⑨
" 25	8:10AM	1	3	11			0	1		
" 26	11:00AM	2	1	12			1	2		
27	8:20AM	3	4	16			0	2		
28	7:10AM	4	0	16			0	2		
29	7:10AM	5	3	19			0	2		
30	7:00AM	6	0	19			0	2		
31	" "	7	0	19	20%	(End)	0	2	2%	
		Sample ③		(115V)						
Jan 26	8:20AM	0	3	3			2	2	1" long 2%	⑭
27	7:00AM	1	2	5		sup	1	3		
28	" "	2	0	5			0	3		
29	8:00AM	3	3	8			0	3		
30	8:00A	4	2	10			0	3		
31	7:00A	5	0	10			0	3		
Febr 1	7:45A	6	0	10			0	3		
2	7:00A	7	0	10	11%	(End)	0	3	3%	
~~Jan 31~~		~~Sample ④~~								~~⑲~~
		0								
		1								
		2								
		3								
		4								

Experiment A,C Strat @ 55°F Refrig Hydrath (2)

Date	Time of day		Germ. time (days)	Tips No.	Tips Cum.	Tips %	Germination No.	Germination Cum.	Germination %	Strat. No. of days
	Sample	(4)		(77)	(76 V)					
Jan 31	7:00A	out	0	1	1		1¼" → 1	1	1%	(19)
Febr 1	7:50A		1	0	1		0	1		
2	7:00A		2	3	4		0	1		
3	8:00A		3	2	6		0	1		
4	8:00A		4	0	6		0	1		
5	7:40A		5	0	6		0	1		
6	7:10A		6	0	6		0	1		
7	7:00A		7	0	6	8%	0	1	1%	
	Sample	(5)		(59)	(58 V)		(End)			
Febr 6	7:00A	out	0	4	4		2" long → 1	1	2%	(25)
7	7:30A		1	0	4		0	1		
8	7:00A		2	0	4		0	1		
9	8:00A		3	0	4		0	1		
10	6:40A		4	1	5		0	1		
11	8:40A		5	0	5		0	1		
12	8:00A		6	0	5		0	1		
13	8:00A		7	0	5	9%	0	1	2%	
	Sample	(6)		(82)	(80 V)		(End)			
Febr 13	7:30A	out	0	6	6		2.5" long → 1	1	1%	(32)
14	6:50A		1	1	7		0	1		
21	4:30A		8	1	8	10%	0	1	1%	
							(End)			
			2							
			3							
			4							
			5							
			6							
			7							(48)
[redacted]	Sample	(7)		(65)	(64 V)					
March 1	9:00A	out	0	9	9		0	0	0%	(50)
" 2	9:00A		1	0	9		0	0	0	
" 3	9:00A		2	5	14		0	0	0	
" 8	9:00A		7	0	14	22% End	0	0	0%	
		[redacted]	4							
			0							
			5							

Last sample is (6) out March 10

55
13
1
69

Experiment Ae Strat @ 55°F (H₂O bath) redrig (3)

Date	Time of day		Germ. time (days)		Tips No.	Tips Cum.	Tips %	Germination No.	Germination Cum.	Germination %	Strat. No. of days
Last →	Sample	(8)		(69)		(68V)					
March 10	8:30A	out	0		15	15		1	1	1%	
" 11	7:00A		1		0	15		0	1		
" 12	8:30A		2		1	16		1	2		
" 13	8:00A		3		1	17		0	2		
" 14	9:00A		4		0	17		0	2		
" 21	11:00A		5		10	27-21	31%	0	2	3%	
			6					(End)			
			7								
	Sample			( )		( )					
		out	0								
			1								
			2								
			3								
			4								
			5								
			6								
			7								
	Sample			( )		( )					
		out	0								
			1								
			2								
			3								
			4								
			5								
			6								
			7								
	Sample			( )		( )					
		out	0								
			1								
			2								
			3								
			4								
			5								
			6								
			7								

A, d Strat 50°F Petri Not aerated

Evansville Summit Seed

(Farm lab 7 redrig)

1969-70



Mar 4 1970
Hormay

Exp A, d Strat @ 50°F Redrig Path, Lab

Sus Sum Seed

Seed soaked 24 hrs (lab.) then into 50°F Dec 27/1969 9:00AM

Sample No	Date sample taken	No of days Strat.	No of viable seeds	Germ'b in 7 days @ 68°F T.P.S %	Germination %	In Strat %
1	Dec 28	1	104	No record	0	0
2	" 31	4	120	" "	6	0
3	Jan 2	6	110	" "	13	0
4	" 5	9	107	63	7	1
5	" 8	12	111	68	6	0
6	" 12	16	107	76	11	1
7	" 15	19	128	70	12	3
8	" 19	23	111	62	5	1
9	" 23	27	104	76	6	1
10	Febr. 11	46	100	62	6	2 Last
			Total	477	72	9
			Ave	68	7	1

Experiment A, d Strat @ 50°F (1) (Petri)

Seed soaked 21 hrs; Then into temp Dec 27 9:00 AM (0)

Date 1969-70	Time of day		Germ. time (days)	Tips No.	Tips Cum.	Tips %	Germination No.	Germination Cum.	Germination %	Strat. No. of days
	Sample (1)			( )	104 V →					
Dec 28	9:00AM	out	0	No Tips record			0	0	0%	(1)
29	"		1				0	0	0	
30	"		2				0	0	0	
31	"		3				0	0	0	
Jan 1	"		4				0	0	0	
2	"		5				0	0	0	
3	"		6				0	0	0	
4	"		7				0	0	0% (End)	
	Sample (2)			( )	120 V →					
Dec 31	9:00AM	out	0				0	0	0%	(4)
Jan 1	"		1	"	"		3	3		
2	"		2				4	7		
3	"		3				0	7		
4	"		4				0	7		
5	"		6				0	7		
6	"		6				0	7		
7	"		7				0	7	6%	
	Sample (3)			( )	110 V →					(6)
Jan 2	9:00AM	out	0				0	0	0%	
3	"		1	"	"		7	7		
4	"		2				3	10		
5	"		3				4	14		
6	"		4				0	14		
7	"		5				0	14		
8	"		6				0	14		
9	"		7				0	14	13%	
	Sample (4)			( )	( )					
		out	0							
			1							
			2							
			3							
			4							
			5							
			6							
			7							

Exp A, d (2)

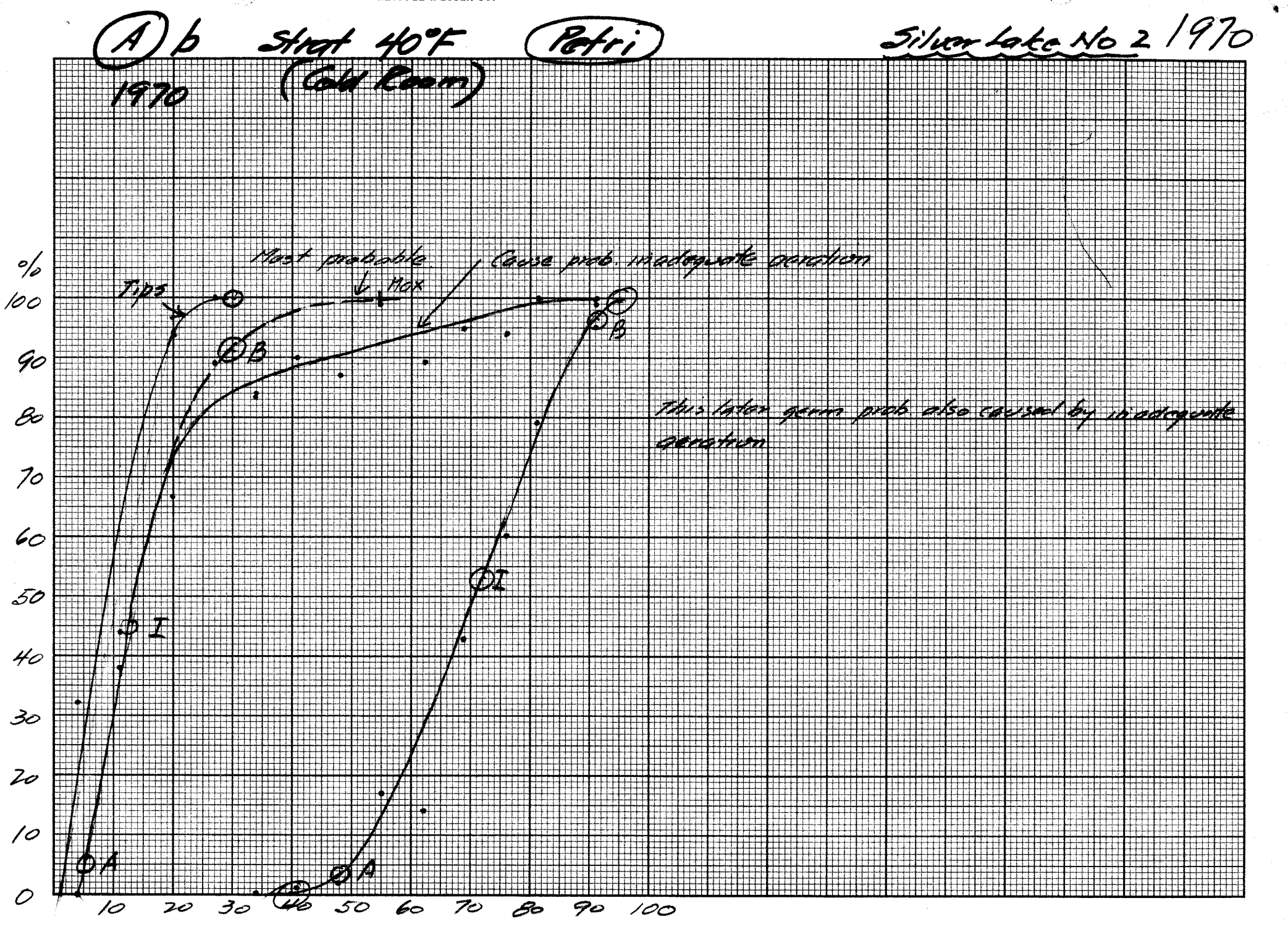
No 6(a) Exp 2-70 Strat @ 50°F Cont'd

Date		Time	Germination time Days	Hrs	Tips No	Tips Cum	Tips %	Germination No	Germination Cum	Germination %	Strat Days
	Sample		(4)		(108)	(107V)					
Jan 5	1970	9.30	out	0	21	21		1	1	1%	(9)
6	"	9.30	1,0		20	41		Tips 2	3		
7			2		11	52		Tips 4	7		
8		10:15	3		8	60		0	7		
9		9:00A	4		1	61		1	8		
10			5		6	67		0	8		
11		8:00	6		0	67		0	8		
12		9:00A	7	(End)	0		63%	0	8	7% Germination	
	Sample		(5)		(112)	(111V)			No	Cum	%
Jan 8		10:30A	out		37	37			0	0	0% (12)
9		9:00A	1		21	58			1	1	
			2		8	66			6	7	
			3		6	72			0	7	
12		9:00A	4		0	72			0	7	
13		8:00A	5		0	72			0	7	
14		9:00A	6		3	75			0	7	
15		8:30A	7		1	76	68% (End)		0	7	6%
	Sample		(6)		(107)	(107V)					
Jan 12		9:00A	out	0	37	37			1	1	1% (16)
" 13		8:00A		1	17	54		Tips 5 Sup 2	7	8	
14		9:00A		2	9	63		Tips	3	11	
15		8:45A		3	8	71		Tips	1	12	
16		11:00A		4	2	73			0	12	
17		8:45A		5	5	78			0	12	
18		8:45A		6	0	78			0	12	
19		12:00 noon		7	1	79	61% (End)		0	12	11%
	Sample		(7)		(130)	(128V)					
Jan 15		8:30A	out	0	48	48			4	4	3% (19)
16		11:00A		1	25	73		4 tips 1 sup	5	9	
17		8:45A		2	12	85		Tips	3	12	
18		8:45 M		3	0	85		"	3	15	
19		12:00 noon		4	0	85			0	15	
20		8:00 AM		5	0	85			0	15	
21		6:50 AM		6	2	87			0	15	
22		8:00 AM		7	2	89	78% (End)		0	15	17%

Exp A, d Strat @ 50°F (3)

Date	Time	Germ time Days	Tips #/o	Tips Cum	Tips o/o		Germination #/o	Germination Cum	Germination o/o	Strat days
	Sample (8)		112	111 V						
Jan 19	12 noon out	0	40	40			1	1	1%	(23)
" 20	8:00 AM	1	14	54		Tips	1	2		
21	6:50 AM	2	0	54			0	2		
22	8:00 AM	3	7	61		Tips	2	4		
23	11:00 AM	4	2	63			0	4		
24	8:15 AM	5	1	63			0	4		
25	7:00 AM	6	3	66		Tips	1	5		
26	7:00 AM	7	3	69	6%		0	5	5%	
	Sample (9)		105	104 V				(End)		
Jan 23	11:00 AM	0	53	53			1	1	1%	(27)
" 24	8:15 A	1	3	56			2	3		1.8
" 25	7:00 A	2	11	67		1 Tip 1 Scap	2	5		
" 26	7:00 A	3	10	77		Tip	1	6		
27	7:00 A	4	0	77			0	6		
28	7:00 A	5	0	77			0	6		
29	8:00 A	6	1	78	1%		0	6		
30	8:00 A	7	0	78	1%	End	0	6	6%	
Last →	Sample (10)	Last		101	100 V	2 to 3.5"				(46)
Feb. 11	8:15 A.	0	47	47			2	2	2%	
12	8:00 A	1	7	54			2	4		
13	7:30 A	2	6	60			2	6		
14	6:50 A	3	2	62	Budget		0	6	6% in 7 days	
21	4:30	10	0	62	6%		1	7	7%	
						(End)				
		1								

use 6% in 7 days


(A) b Strat 40°F (Petri)
Silver Lake No 2 1970
1970
(Cold Room)
%
Most probable
Max
Tips
Cause prob. inadequate aeration
This later germ prob also caused by inadequate aeration
A
B
I
A
B
I
0
10
20
30
40
50
60
70
80
90
100

Dec 24 1970
Hormay

Experiment Summary

Exp. (A) b Treatment Strat 40°F (Cold room) (Petri)

Seed - source, name Silver Lake No 2 89% viability

Treatment details Test period Apr 7 – July 6 1970

Date

April 7 1970 3PM Seed into strat after soaking

Germination record

Date	Sample No	Treatment (strat) No. of days	No. of seeds Total	No. of seeds Viable calc	Germination 1/ Tips Percents	Germination 1/ Complete Percents	Germination in treatment Percent
Apr. 11	1	4		101	32	0	0
18	2	11		84	44	38	0
27	3	20		105	94	67	0
May 4	4	27		88	100	89	0
11	5	34		91	100	83	0
18	6	41		105	100	90	1
25	7	48		107	100	87	2
June 1	8	55		78	100	99	17
8	9	62		76	91	89	14
15	10	69		99	98	95	43
22	11	76		80	98	94	60
27	12	81		83	100	100	79
July 6	13	91		94	100	100	95
" 6	(14) In strat	91		96	100	100	99
" 10	(14) "	95		96	100	100	100

1/ In 7 days @ 68°F. Germination complete when root tip through seed coats.

Silver Lake No 2
Petri

Experiment (A) 6 Strat @ 40°F Cold Room Petri

Petri discs: Silver Lake No 2 1967 seed Started Apr 7 1970 3PM (0)

Date	Time of day		Germ. time (days)	Tips No.	Tips Cum.	Tips %		Germination No.	Germination Cum.	Germination %	Strat. No. of days
	Sample	(1)		(114)	(101 calc)						
April 11	11:00AM	out	0	3	3			0	0	0%	(4) ✓
18	10:00AM		1	29	32	32%		0	0	0%	
			2							(End)	
			3								
			4								
			5								
			6								
			7								
	Sample	(2)		(94)	(84 ~~88~~ V)						
April 18	10:AM	out	0	7	7			0	0	0%	(11) ✓
25	10:30A		7		37	30	21 tips	32	32	38%	
			2			44%				(End)	
			3								
			4								
			5								
			6								
			7			85%	105				
	Sample	(3)		(18)	(~~87~~ V)						
April 27	8:00A	out	0	35	35			0	0	0%	(20) ✓
" 28	8:00A		1	50	85		51 tips 5 sdp	10	10		
" 29	10:00A		2	5	90		36 tips 1 sdp	37	47		
" 30	7:30A		3	1	91		1 tips	18	65		
May 1	8:00A		4	1	92		1 tips	4	69		
2	9:00A		5	1	93		1 tips	1	70		
			6			99	94%			67%	
" 4			7	0	93	88		0	70	70%	
	Sample	(4)		(99)	(~~88~~ V)					(End)	
May 4	8:00A	out	0	70	70			0	0	0%	(27) ✓
" 5	8:00A		1	9	79		33 tips 2 sdp	35	35		
" 5	2:30P		2	3	82		12 tips	12	47		
" 6	9:00A	2	3	3	85		13 tips	13	60		
" 7	10:30A	3	4	2	87			12	72		
" 8	9:00A	4	5	2	89		4 tip 1 sdp	5	77		
9	8:00A	5	6	0	89	100%	1 tip	1	78	89%	
11	9:00A	7	7	excised	0	89-92		0	78	~~88~~%	
										(End)	

Petri

Silver Lake #2
Petri

Experiment (A)6 Strat @ 40F Cold Room

Silver Lake NOY

Start Apr. 7/70 3PM (0)

Date		Time of day		Germ. time (days)		No.	Tips Cum.	%		No.	Germination Cum.	%	Strat. No. of days
		Sample	(5)		(102)		(85% 87V)		excise				
May	11	8:00A	out	0	10 no tips left pos	86	86			0	0	0%	(34) ✓
"	12	8:50A		1		6	92		Tips 54 sup 1	55	55		
"	13	8:00A		2		3	95		Tips 15 sup 3	18	73		
"	14	1:00P		3		0	95		tips	3	76		
"	15	9:00A		4		0	95			0	76		
"	16	10:00A		5		0	95	100%		0	76	83%	
				6									
"	18	7:30A	(6)	7		0	95 105			0	76	87%	
		Sample			(118 88% 104V)				excise	(End)			
May	18	9:30A	out	0	17 no tips left	100	100			1	1	1%	(41) ✓
	19	7:30A		1		5	105		25 tips	25	26		
	20	8:00A		2		0	105		51	51	77		
	21	8:00A		3		0	105		12 tips	12	89		
	22	8:00A		4				100%	tips	4	93		
	23	10:00A		5					tips	2	95		
				6									
	25	8:00A		7			107			0	95	90% ✓	
		Sample	(7)		(120 86% 103V)				excised	(End)			
May	25	8:00A	out	0		97	97			2	2	2% to 10mm	(48) ✓
"	26	8:00A		1		8	105		50 tips 3 sup	53	55	to 7mm ave 3 mm	
"	26	3:00P		2		0	105		12 tips	12	67		
"	27	7:30A		3		0	105		21 tips 1 sup	22	89		
	28	7:30A		4		0	105		1 tips	1	90		
	29	8:00A		5		0	105		tips	2	92	87%	
	30	8:00A		6	13 left Cleaned	0	105	100%	"	1	93		
	31	8:00A				0	105	78		0	93	90%	
		Sample	(8)	7	(88)		(85V)		excise	(End)			
June	1	8:00A	out	0		68	68			13	13	17% to 10mm	(55) ✓
	2	8:40A		1		2	70		2 sup 45 tips	47	60		
	3	7:30A		2		0	70		tips	17	77		
	5	8:00A		3		0	70			0	77		
	6	9:30A		4		0	70	100%		0	77		
	8	9:30A		5		0	70	98%		0	77	99% ✓	
				6									
				7									

Silver #2

Experiment (A)b Strat @ 40°F Petri (3)

Date	Time of day	Germ. time (days)		Tips No.	Tips Cum.	Tips %	Germination No.	Germination Cum.	Germination %	No. of days
		Sample (9)			(85)		76 (X V) excise		14% ~~15%~~	(62) ✓
June 8	9:30A	0	5 fungi 16 tips	53	53		11	11		to 9mm
			Medium sticky gelatinous							
9	7:30A	1	1 fungi 9 tips	4	57		19	30		to 9mm
10	10:30A	2		1	58	91%	29 (27 tips 2 fungi)	59	89%	
11	7:30A	3		0	58	~~85%~~	7 (6 tips 1 fungus)	66	~~96%~~	
15							2	68		
							(End)			
		Sample (10)			(111)		99 (~~97~~ V) excise		43%	(69) ✓
June 15	8:00A	0	Fungi (13) (8)	47	47		43	43	~~44%~~	to 15mm
16	7:30A	1		5	52		36 tips 1 fungus 1 tip	37	80	to 10mm
16	7:30P			0	52			5	85	
17	7:30P	2		1	53		4 tips	9	94	
18	3PM	3		0	53			0	94	95%
19	8AM	4		0	53			0	94	
20	9AM	5		0	53	98		0	94	~~92%~~
22	7:30A	7		0	53	~~55%~~		0	94	
								(End)		
		Sample (11)			(90)		80 (~~76~~ V)		~~60~~ 63%	(76) ✓
June 22	7:30A	0	3 fungus colonies decayed	26	26		48	48		to 12mm ave 6mm
23	8:00A	1	(8)	3	29	98	27 (26 tips 1 fungus)	75		
25	9:00A	3		0	29	~~38%~~	0	75	~~99%~~	
						83	(End)		94%	
		Sample (12)			(93)	(91)			79%	(81) ✓
June 27	8AM		(1)	26	26		66	66	100%	
June 29	10AM			0		~~34%~~ 100%	25	91		
							(End)			

14.

(4)

Experiment (A) b Strat 40° Petri

Date	Time of day	Germ. time (days)		No.	Tips Cum.	%	Germination No.	Cum.	%	No. of days
								94		
	Sample	(13)			(106)		(99)		95%	(91)
5 July 6	11:30AM	0	(11)	6	6		89	89		
7	9:40 AM	1	(9)	1	7		1 cup 6 TIP 7	96		
8	9:00 AM	2	(9)	0	7		0	96		
9	9:00 AM	3		0	7		0	96		
10	9:20 AM	4		0	7		0	96		100%
13	8:30 AM	7			100%		(END)			

Lost Note! → observe in strat. Leave in strat

	Sample	(14)			(108)		(96 ~~100~~ 11) excise			
✓ July 6	11:40AM	0	(8)	1	1		99	99	99%	
✓ " 10		4	(6)	2	3		TIP 1	100		
14	8:50	8			100%		0	100	100%	
							(End)			

	Sample	———			( )		( )			
		0								

K+E 20 X 20 TO THE INCH 46 1240
7 X 10 INCHES MADE IN U.S.A.
KEUFFEL & ESSER CO.

1970 40° Jar 1970

(A) 6 Strat 40°F (Jar) Silver Lake No 2

1970 (Cold room)

BOD curves — Shape and placement prob. because inadequate aeration

%

100

90

80

70

60

50

40

30

20

10

0

At 65°F

In strat @ 40°F

10 20 30 40 50 60 70 80 90 100

Days Strat.

Experiment Summary

Exp. A6 Treatment Strat 40°F (Cold Room) Jar

Seed - source, name Test period Apr. 9 – July 14 1970

Silver Lake No2 89% viability

Treatment details

Date		
Apr. 9	9AM	Seed into soaking @ 40°F
" 18	10AM	" out soaking and into 40°F strat

(0)

Imp. 9 days H_2O strat @ Start in the following figures

Germination record

Date	Sample No	Treatment (Strat) No. of days	No. of seeds Total	No. of seeds Viable	Germination 1/ Tips Percents	Germination 1/ Complete Percents	Germination in treatment Percent
April 27	1	18 or 9		125	75	14	0
May 4	2	25		189	94	56	0
11	3	32		150	93	83	0
18	4	39		128	100	84	0
25	5	46		114	97	89	6
June 1	6	53		179	100	93	6
4	7	56		116	100	98	9
8	8	60		155	100	94	15
15	9	67		137	100	91	25
22	10	74		98	100	98	35
27	11	79		135	100	94	60
July 14	Last 12	97		609	100	98	89

1/ In 7 days @ 68°F. Germination complete when root tip through seed coats.

Silver Lake No 2 Jar

Experiment (A) b Jar Start 40°F Cold Room

Jar Silver Lake No 2 seed Started Apr 9/70 9:00 AM (0)

Date	Time of day		Germ. time (days)	Tips No.	Tips Cum.	Tips %		Germination No.	Germination Cum.	Germination %	Strat. No. of days
	Sample (X)			( )	( )		@ 40°F				
April 18		out	0	This seed into H_2O for soaking							
			1	Apr 9. Not drained until Apr. 1							
			2	18 10 AM So first sample							
			3	taken Apr 27							
			4								
			5								
			6								
			7			Calc from later excise					
	Sample (1)			(140)	(125)						
April 27	8:00	out	0	9	9			0	0	0	(18)
" 28	8:30 A		1	50	59			0	0	0	
" 29	10:00 A		2	16	75			5	5		
" 30	7:30 A		3	7	82		9 tips	9	14		
May 1	8:00 A		4	9	91		3 tips	3	17		
2	9:00 A		5	3	94		1 tips	1	18	14%	
3	———		6	———	———	75%	———	———	———	———	
4			7	0 75%	94	189		0	18		
	Sample (2)			(212)	(158 V)		27 non Excise	(End)			
May 4	9:15 A	out	0	103	103			0	0	0	(25)
5	8:00 A		1	53	156		10 tips	10	10		
5	2:30 P		2	5	161		tips	9	19		
6	9:15 A		3	10	171		53 tips	53	72		
7	10:30 A		4	2	173		25 tips	25	97		
8	9:00 A		5	3	176		Tip 6	6	103		
9	8:30 A		6	0	176	94%	tips	2	105	56%	
11	9:30 A		7	106 lost	2	178	150	tip	1	106	67%
	Sample (3)			(168 79%	132 V)		Excise		(End)		
May 11	10:00 AM	out	0	54 no left tips	113	113		0	0	0	(32)
" 12	9:00 AM		1	23	136		22 tips	23	23		
" 13	8:30 AM		2	1	137		150 p	89	112		
" 14	1 PM		3	1	138		BB tips	8	120		
" 15	9:00 A		4	0	138		tips	0	120		
" 16	10:00 A		5	0	138		"	3	123	83%	
			6								
18	7:30 A		7	0	138	93%		1	124	94%	
								End			

9 days H_2O start ↓ first

Silver Lake No 2

[redacted]

③ = 94%

Experiment (A) 6 Jar strat 40°F Cold Room

Silver Lake 2 — Started Apr 9

Date		Time of day		Germ. time (days)	Tips No.	Tips Cum.	Tips %		Germination No.	Germination Cum.	Germination %	Strat. No. of days
		Sample	(4)		(144 76% 128 V)			excise				
May	18	9:30A	out	0 (29 tips left)	115	115			0	0	0%	(39)
	19	7:30A		1 (18 " ")	11	126		tips 22	22	22		
	20	8:00A		2 (5 " ")	3	129		tips	63	85		
	21	7:30A		3 (3 " ")	2	131		tips	26	101		
	22	8:00A		4	0	131		tips	5	106		
	23	10:00A		5	0	131		tips	2	108	84%	
	24			6	—	—	100%		—	—		
	25	8:00A		7	0	131	114		0	108	99%+	
		Sample	(5)		(128 [illegible] 122 V)			excise		End		
May	25	8:00A	out	0	93	93		5 sup 50 tips	7	7	6%	(46)
"	26	8:00A		1	7	100		2 sup	52	59	to 10 mm Ave 4 mm	
"	26	3:00P		2	0	100		tips	15	74		
	27	7:30A		3	0	100		tips 22	22	96		
	28	7:30A		4	1	101		3 tips 1 sup	4	100		
	29	8:00A		5	0	101		tips	2	102	89%	
	30	8:00A		6	0	101	97%		0	102		
	31	8:00A		7	0	101	179		0	102	95%	
		Sample	(6)		(201 [illegible] 175 V)			excise		(End)		
June	1	9:30A	out	0	168	168		sup 72 tips	10	10	6%	(53)
	2	9:00A		1	1	169		1 sup 62 tips	73	83	to 10 mm	
	3	7:30A		2	0	169			62	145	to 12 mm	
	4	7:30A		3	0	169		tips	14	159		
	5			4	0	169		1 sup 6 tips	7	166		
	6	9:30A		5	0	169			0	166	93%	
	8	9:30A		6	1	170	100%		1	167	95%	
				7			o/c		(End)			
		Sample	(7)		(130)	(116 V)		excise				
June	4	8:00A	out	0 (17)	103	103		10 sup 78 tips	10	10	9%	(56)
	5	8:00A		1	2	105			78	88		
	6	9:30A		2	3	108		22 tips 2 sup	24	112	o/c	
	8	10:00A	4	3	0	108	100%		2	114	98%	
				4								
				5					(End)			
				6								
				7								

Silver #2 (3)

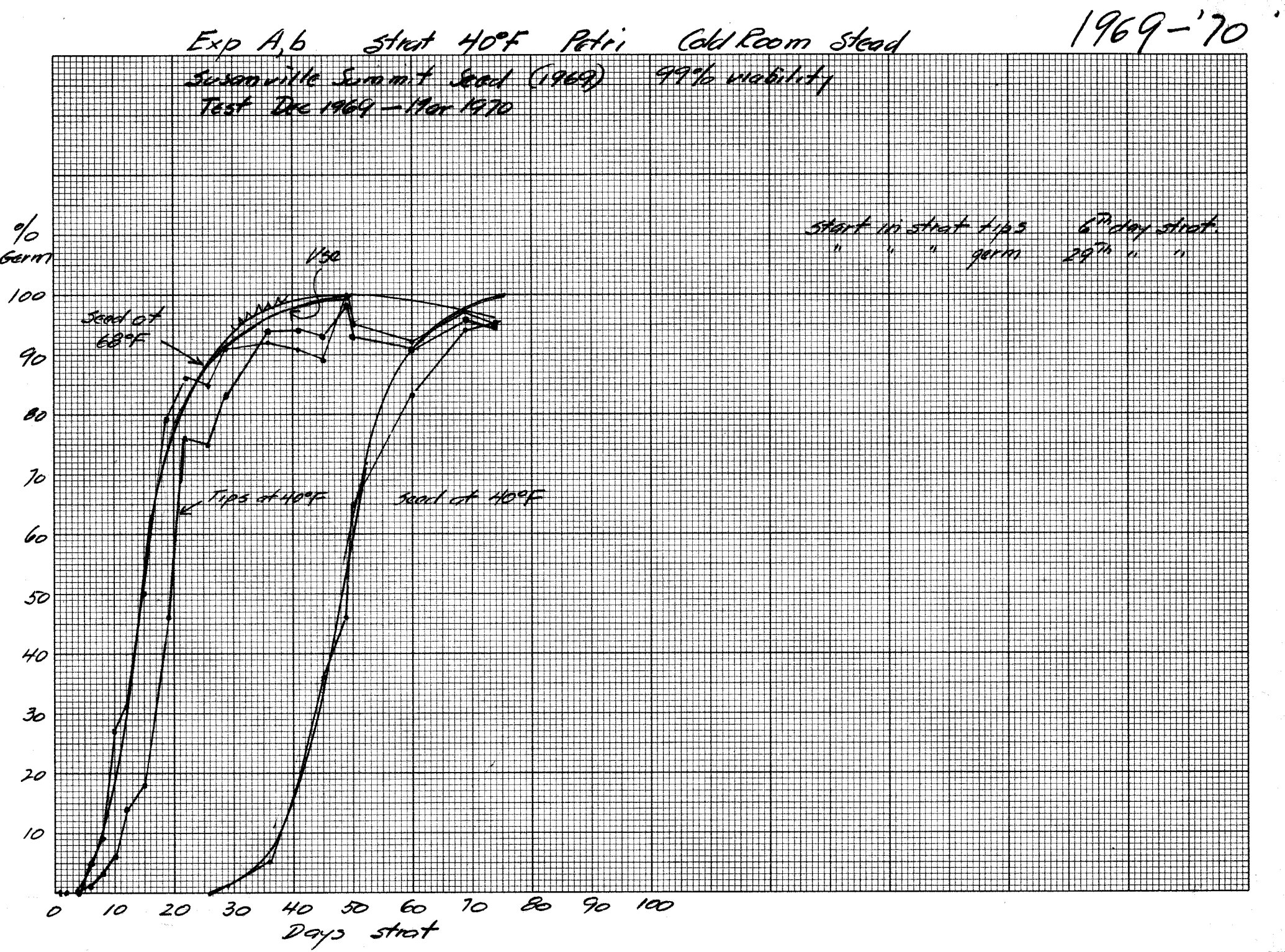
Experiment (A)b Strat @ 40°F Jar

Date		Time of day	Germ. time (days)		No.	Tips Cum.	%	Germination No.	Cum.	%	No. of days
								155			
	Sample	(8)				(174)		(152)		excise 15%	
June	8	9:30A	0	(25)	176	176		23	23	to 1mm	(60)
	9	7:30A	1		7	133		1 tip 50 tips 1 sop 61	84	to 9mm	
	10	10:30A	2		0	133		51	135		
	11	7:30A	3		0	133		4 tips 7	142		
	12	8:00A	4		0	133		3	145		
	15		7		0	133	100%	1	146	94% 96%	
								(End)			
								137		25%	
	Sample	(9)				(154)		(128)		excise 27%	(67)
June	15	8:00A	0	(25)	95	95		34	34		
	16	7:45A	1		3	98		56 tips 1 sop 57	91		
	16	7:30P			0	98		4 tips 1 sop 16	107		
	17	12:30P	2		0	98		1 sop 16	123		
	18	3PM	3		0	98		1	124		
	19	8A			0	98		1	125		
	20	9A			0	98		1	125	91% 98%	
	22	8A			0	98	100%	0	125		
								(End)			
								98			
	Sample	(10)				(110)		(96 V)		excise 35%	(74)
June	22	8:00A	0	(17)	58	58		sop 34	34	to 10mm	
	23	8:00A		(13)	2	60		4 tips 3 sop 45	79	Ave 5mm	
	24	9:AM			0	60		Tips 17	96	100% 98%	
							100%				
								(End)			

Silver #2

Experiment (4) (A)b Strat 40°F Jar

Date	Time of day		Germ. time (days)	No.	Tips Cum.	%	No.	Germination Cum.	%	Strat. No. of days
Next to Last → Sample	(11)			(152)	(135)	etc			60%	
June 27	8:00	out	0	(22) 49	49		81	81	60% Tollm Ave Trm	(79)
			1							17
June 29	10:00 AM		2	(16) 6	55		44	125		
30	8:45A		3	(15) 0	55		TIP 1	126		
July 1	9:30 Am		4	0	55		TIP 1	127		
2	9:00		5	(14) 1	56	100%	0	127		
6	11:40 AM		6	0	56		0	127	94%	
			7	Put in dish	609		(END)		+	(96)
Last → Sample	(12)			(684)	~~379~~	excise				
July 14	9:30	~~out~~	0	(87) 53	53		545	545	89	
			1	In strat dish now on (4 feet)						(97)
			2	(every) 3 or 4 days						
July 16	9:30	out	3			5 tips	6	551		(98)
20	9AM		4			13 sp				
21	9AM		5			29 tip				
22	12:30P		6	25 Non via discarded		10 sp	39	590		
			7			2 tips	2	592		
						5 tips	5	597		
					100%					
Sample				( )	( )		(End)		98%	
		out	0							
			1							
			2							
			3							
			4	Sample 17 req 68°F germination record.						
			5							
			6							
			7							
Sample				( )	( )					
		out	0		Finish					
			1							
			2							
			3							
			4							
			5							
			6							
			7							


Exp A,6 Strat 40°F Petri Cold Room Stead
1969-'70
Jessamine Summit Seed (1969) 99% viability
Test Dec 1969 — Mar 1970
% Germ
Start in strat tips 5
" " " germ
6th day strat.
29th " "
1/30
Seed at 68°F
Tips at 40°F
Seed at 40°F
100
90
80
70
60
50
40
30
20
10
0 10 20 30 40 50 60 70 80 90 100
Days strat

Experiment Summary

Exp. A, b Treatment Strat 40°F Petri Cold Room Stead

Seed - source, name Susanville Summit 1969 99% viability

Treatment details

Date 1969

Dec 24 Seed soaked 11:AM - 3:00 PM (4hrs) and then into 40°F strat.

Germination record

Date	Sample No	Treatment (Strat) No. of days	Factor	viable seeds	No. of seeds Total	Viable	Germination 1/ Tips Percents No	%	Complete seeds Percents No	%	Germination in treatment Tips No	%	Seeds Percent No	%
Dec 25	1		8896	1	116	115 calc	0	0	0	0	0	0	0	0
26	2		9009	2	112	111	4	4	0	0	0	0	0	0
28	3		9804	4	103	102	6	6	0	0	0	0	0	0
30	4		8333	6	121	120	24	20	6	5	1	1	0	0
Jan 1	5		8547	8	118	117	43	37	11	9	4	3	0	0
3	6		8696	10	115	115	56	49	31	27	7	6	0	0
5	7		8621	12	116	116	71	61	36	31	16	14	0	0
8	8		8403	15	120	119	89	75	60	50	21	18	0	0
12	9		8621	19	117	116	88	76	92	79	53	46	0	0
15	10		8772	22	115	114	99	87	98	86	87	76	0	0
19	11		8772	26	115	114	102	89	97	85	86	75	0	0
22	12		8696	29	118	115	106	93	105	91	84 95	83	1	1
29	13		8929	36	115	112	107	96	103	92	99 105	94	6	5
Febr 3	14		8850	41	116	113	109	96	103	91	106	94	21	19
7	15		8696	45	117	115	110	96	102	89	107	93	41	36
11	16		8929	49	115	112	113	100	112	100	110	98	51	46
12	17		8850	50	115	113	109	96	107	95	105	93	73	65
22	18		8772	60	117	114	109	96	105	92	104	91	95	83
Mar 3	19		8621	69	118	116	114	98	112	97	111	96	109	94
8	20		8475	74	121	118	112	95	112	95	112	95	112	95

1/ In 7 days @ 68°F. Germination complete when root tip through seed coats.

Exp A, 6 (1) Jos Summit Petri Dec 24, 1969

(No 1) Exp 1-70 Strat @ 40°F Lot A Hornay

Soak and Strat @ 41°F. Germinate 7 days at 68°F
Seed Susanville Summit July 23, 1969

Dec 24 1969 Soaked 11 AM - 5:00 PM = 4hrs (0) then drained and into strat

Sample (1) (116) (110V) (1) day strat Germ approx

Date	Time	Strat Days	Strat hrs	No	Tips Cum	Tips %	Germ time Days hrs	Germination No	Germination Cum	Germination %
Dec 25	11:00A	(out)	19	0	—	—	0 0	0	—	—
26	9:00A			0	—	—	22	0	—	—
27	8:00A			0	—	—		0	—	—
28	9:00A			0	—	—		0	—	—
29	9:00A			0	—	—		No germination		0%
30	9:00A			0	—	—		0	—	—
31 Return	9:00A		(111V)	0	—	0%		0	—	— (End)

Sample (2) (112) (108V) (2) days

Dec 26	(out)	10:00A	42	0	—	—		0	—	—
27				0				0		
28				0				0		
29				0				No germination		
30				0				0		
31				0				0		
Jan 1				4	? Plumping?			0		0%
2				4		3%		0		(End)

Sample (3) (103) (103V) (4) days

Dec 28	(out)	9:00A	89	0	—	—		0	—	—
1 29		9:00A		0	—	—		0		
2 30		9:00A		0				0		
3 31		9:00A		2	2 Plumping			0		
4 Jan 1		9:00A		4	6 " "			No germination		
5 2		9:00A		0	6 " "			0		0%
6 3		9:00A		0	6			0		
7 4		7:20A		0	6 "	6%		0 "	"	End

Exp A, b (2)

(No 1) Exp 1-70 Strat @ 41°F Lot A Cont'd (1)

Date	Time	Germination			Tips			Germination		
		Sample	Time since start		No	Cum for day	%	No	Cum	%
			Days	hrs						
Dec 30	9:00A (out)	Sample	4		6 days				121	120V
" 30	9:00A				1 plump			0	0	—
" 31	8:00A	1 ±			6	7		0	0	
Jan 1	8:00A	2			4	11		6	6	
2	9:00A	3			0	11		0	6	
3	9:00A	4			8	19		0	6	
4	7:30A	5			0	19		0	6	
5	8:30A	6			5	24	20%	0	6	
6	8:00A	7			0	24	(End)	0	6	5%
Jan 1	9AM out	Sample	5		8 days				118	117 V
"	9AM	0	0	—	4	4	(plump)	0	0	—
" 2	9AM	1 ±	—		1	5		4	4	
3	9AM	2	—		24	29		6	10	
4	9:AM	3			9	38		0	10	
5	9:AM	4			0	38		0	10	
6	8:AM	5			0	38		1	11	
7	8:30A	6			1	39	32%	0	11	
8	9:30A	7			4	43	(End)	0	11	9% Factor
Jan 3	9:00 out	Sample	6		10 days				115	115V 8696
" 3	"	0	0		7	7		0	0	0
4	9:00A	1 ±			20	27		17	17	15
5	"	2			15	42	9 tips → 3 sprouts	12	29	25
6	8:00A	3			3	45	Tips → 2	2	31	27
7	8:30A	4			9	54	49%	0	31	27
8	9:30	5			0	54	~~51%~~	0	31	27
9	8:00A	6			2	56	~~49%~~	0	31	27
10	10:00A	7			0	56	(End)	0	31	27%

Exp A, 6 (3)

(No 1) Exp 1-70 Strat @ 41°F Lot A Cont'd (2)

Date	Time	Germination time Days	Hrs	Tips No	Tips Germ	%	Germination No	Germination Germ	Germination %	Strat Days
	Sample (1)			(116)	(116 V)					
Jan 5 1970	8:00A (out)	0		16	16		0	0	0	(12) ✓
6 "	8:00A	1.0		26	42		17 (6 Tips, 11 Sample)	17		
7	8:30A	2		15	57		16 (14 Tips, 2 Sdp.)	38		← Roots up to 10 mm
8	9:30A	3		2	59		3 Tips	36		
9	8:00H	4		2	61		0	36		
10	10:00A	5		5	66	72 64%	0	36		
11	8:00A	6		2	68		0	36		
12	8:00A	7		3	71	(End)	0	36	31%	
	Sample (8)			(120)	(119 V)					
Jan 8	9:00A	out		21	21		0	0	0	(15) ✓
" 9	8:00A	1		46	67		15 (7 Tips, 8 Sdp)	15	13	
" 10	10:00A	2		11	78		38 (36 Tips, 2 Sdp)	53	45	
11	8:00A	3		1	79		4 Tips	57	48	
12	8:00A	4		3	82		2	59	50	
13	7:30A	5		0	82	83 75%	1	60	50	
14	8:30A	6		4	86		0	60		
15	7:45A	7		3	89	(End)	0	60	50%	(19) ✓
Jan 12	Sample (9)			(117)	(116 V)		— Error 8621			
Jan 12	8:00A	out		53	53		0	0	0	
" 13	7:40A	1		20	73		Tips 36, Sdp 12 — 48	48	41	
14	8:30A	2		10	83		Tips 34, Sdp 6 — 40	88	76	
15	8:00A	3		3	86		Tips 2 — 2	90	78	
16	9:30A	4		0	86		Tips 2	92	79	
17	8:30	5		0	86	91%	0	92	79	
18	8:35	6		1	87	76%	" 0	92	79	
19	11:15	7		1	88	(End)	" 0	92	79%	
	Sample (10)			(115)	(114)		— By excise ok			
Jan 15	7:20A	out		87	87		0	0	0	(22) ✓
" 16	10:00A	1		7	94		55 Tips, 6 Sdp — 61	61	54	
16	4: PM			4	98		Tips 11	~~98~~	~~88~~	
" 17	8:30A	2		1	99		Tips 16, 1 Sdp	88	77	
" 18	8:35A	3		0	99	93%	8 Tips — 9	97	85	
" 19	11:20A	4		0	99	89%	Tips 1 — 6	98	86	
" 20	7:40A	5		0	99	89%	0	98		
21	6:40	6		0	99		0	98		
22	7:20	7		0	99	(End)	0	98	86%	

Exp A, 6 Lot A Strat @ 41°F (4) Instrat

Date	Time		Germ time (days)	Tips No	Tips Cum	%		Germination No	Germination Cum	%	Strat days
1970											
	Sample		(11)		115	114 V	- excise	8871			
Jan 19	11:15 AM	out	0	86	86			0	0	0	(26)
20	8:45 AM		1	11	97		34 tips	34	34	30	
"	4:00 PM			4	101		Tips	36	70	61	
21	6:40 AM		2	0	101		Tips	20	90	79	
22	7:35 A		3	1	102		Tips 5 Sup 1	6	96	84	
23	10:00 A		4	0	102		Tips	1	97	85	
24	8:00 A		5	0	102	90		0	97	85	
25	7:00 A		(6)	0	102			0	97	85	
26	7:00 A		7	0	102	(End)		0	97	85%	
	Sample		(12)		118	113 V	- Excise				
Jan 22	7:40 AM	out	0	94	94	95	Factor 8696	1	1	(1%)	(29)
	4:00 PM		0.66	10	104	This		3			
" 23	10:00 AM		1	2	106	includes	75 tips 1 sup	76	80	~~75~~ 69 70	
24	8:00 A		2	0	106	1st day	Tips	24	104	90	
25	7:00 A		3	0	106	and		1	105	91	
26	7:00 A		4	0	106	supply		0	105	91	
27	7:00 A		5	0	106	germ		0	105	91	
28	7:00 A		6	0	106	97%		0	105	91	
29	7:00 A		7	0	106	~~98%~~		0	105	(91%)	
	Sample		(13)		115	107 (End)					
Jan 29	7:50 A	out	0	99	99	112 V	- Excise				
30	7:00 A		1	2	101	105	2-13 mm →	6	6	5%	(36)
30	4:00 P			0	101		Tips 76 Sup 1	77	83		
31	6:45 A		2	0	101		Tips	11	94		
Feb 1	7:30 A		3	0	101		Tips	8	102		
2	7:40 A		4	0	101			0	102		
3	7:40 A		5	0	101			0	102		
4	7:40 A		6	0	101			1	103		
5	7:30 A		7	0	101	107		0	103		
						96%		0	103	92%	
						(End)					

Experiment A,6 Lot A Start @ 41°F (5)

Date	Time of day		Germ. time (days)	Tips No.	Tips Cum.	Tips %		Germination No.	Germination Cum.	Germination %	Strat. No. of days
	Sample (14)			(116)	(113 V)		excise				
Febr. 3	7:45A	out	0	85	85	106 factor 0850	1-11mm	21	21	19%	(41) ✓
" 3	4:00P		10hrs	0	85		Tips	14	35		
" 4	7:40A		1	0	85		"	54	89	80	
" 4	3:00P		2	1	86		"	11	100	89	
5	7:30A		3	1	87			2	102	90	
6	6:45A		4	0	87			0	102	90	
7	7:00A		5	0	87	96%		1	103	91	
8	7:00A		6	0	87			0	103	91	
9	7:00A		7	0	87	1080	excised	0	103	91%	
	Sample (15)			(117)	(115V)			(End)			
Febr 7	7:00A	out	0	66	66	107	1-14mm Ave 5mm	41	41	36%	(45) ✓
" 8	7:00A		1	2	68		50 TPS	51	92		
" 8	11:30A		2	0	68		136 TPS	4	96		
9	6:45A		3	1	69		4 TPS	6	102		
10	6:45A		4	0	69		"	0	102		
11	7:30A		5	0	69			0	102		
12			6	0	69			0	102		
13			7	0	69	97%		0	102	89%	
14					69-110						
	Sample (16)			(115)	(112 V)		o/c	(End)			
Febr 11	7:30A	out	0	59	59	110	Max Ave 18mm	51	51	46 45%	49 ✓
" 11	2:30P	7hrs	1	0	59		Tips	(22)	~~73~~		
" 12	7:00A		2	3	62	113	Tips 35	(35) →	108	96	
" 12	3:00P		3	Lost				4	112	100	
" 13	7:00A	2	4			100%		0	112	100%	
" 21	4:25P	10	5					0	112	99%	
			6					(End)			
			7								
	Sample (17)			(115)	(113 V)		o/c				
Febr 12	7:00A	out	0	32	32	105	20mm	73	73	65%	50 ✓
" "	3:00P		1	4	36		Tips	17	~~85~~		
" 13	7:00A		2	0	36		"	12	102		
14	6:35A		3	0	36		"	5	107		
21	4:30P		4	0	36	96%		0	107	95%	
			5					(End)			
			6								
			7								

= 39.5

Experiment A, b Lot A Strat @ 41°F 6

Date	Time of day		Germ time (days)		No.	Tips Cum.	%		Germination No.	Cum.	%	Strat. No. of days
	Sample	(18)		117		114 V		-excise ✓				
Febr 22	9:45A	out	0	1 no tip 2 lost/non	9	9	104	30 mm	95	95	83%	60 ✓
" 23	8:35A		1	—	3	12		tips	9	104		
" 27	11:00A		2 5		0	12		tips	1	105		
" 28	8:00A		3 6		2	14	109		0	105		
Mar 1	8:00A		4 7		0	14	96%		0	105	92%	
			5									
			6						(End)			
			7	2 nonviable								
	Sample	(19)		118		116 V						
Mar 3	9:25A	out	0		2	2	111		109	109	94%	69 ✓
4	8:30A		1		2	4		tips	1	110		
5	8:00A		2		0	4			2	112		
6	8:00A		3		0	4			0	112		
7	9:00A		4		0	4			0	112		
8	8:10A		5	2 lost	1	5			0	112		
9	8:00A		6		0	5			0	112		
10	8:00A		7		0	5	114 98%		0	112		
	Sample	—		( )		( )			(End)		97%	
		out	0					4 "ribbon" seeds did not germinate				
			1									
			2									
			3									
			4									
			5									
			6									
			7									
	Sample	—		( )		( )						
		out	0									
			1									
			2									
			3									
			4									
			5									
			6									
			7									

✓ This means ungerminated seeds excised and viability determined. In this case 9 seeds that did not germinate by Mar. 1. The excised embryos however grew normally.

A, 6 Lot A Strat @ 39.5°F

In stratification germination record

Starting Febr. 9, 1970

Days start →

Date	Time of day	Sample 16 No	16 Length	17 No	17 Length	18 No	18 Length	19 No	19 Length	74 121 No	74 121 Length	74 118V 20 No	74 118V 20 Length
		Number germinated & length radical mm (max)											
Febr 9	7:00A	33	18	41	16	48	18	43	15			36	18
" 10	8:00A	11	18	11	16	6	18	7	15			3	18
" 11	7:30A	7	18	—	—	—	—	—	—			—	—
" 12	7:30A	End		21	18	12	19	11	15			20	19
" 13		Sample		End		7	20	10	17			8	21
" 14		out of strat				4	20	5	17			6	21
" 22		and into				18	30	22	23			27	25
" 23		germinat-				End		2	23			6	25
" 27		ion						9	26			4	29
Mar 1								0				2	
" 3								0	30			0	
7												0	37 mm
8													

3 inviable Removed Add to total seeds

→ { 6 no-tip seeds left
" " " " " ; excised
These 6 stubborn seeds all viable germinated, healthy vigorous (in old dish)

Date				Cumulated total to date									
Febr 11	7:30A	51	18										
12	7:30A			73	18								
22						95	30						
Mar 3	8:30A							109	30mm				
Mar 8	8:30A											112	35mm

+ 6 viable but did not germinate

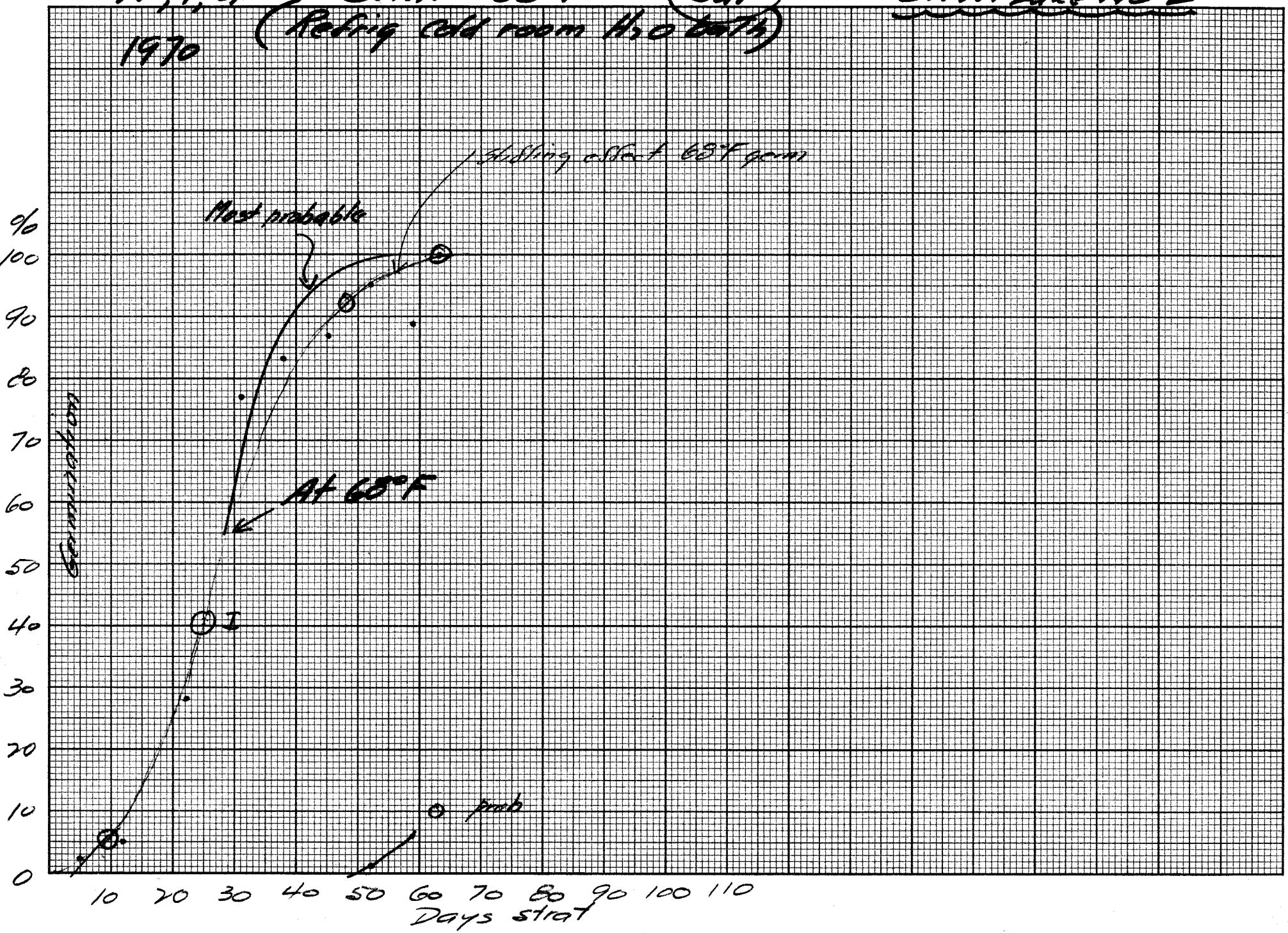
95%

K+E 20 X 20 TO THE INCH 46 1240
7 X 10 INCHES MADE IN U.S.A.
KEUFFEL & ESSER CO.

1970 (1)

A, 9, 9 Strat 35°F (Jar) Silver Lake No 2

1970 (Refrig cold room H₂O bath)



Dec 23 1970
Hermay

Experiment Summary

Exp. A,9,9 Treatment Stm + 35°F (Cold rm. redrig Jar in H₂O bath)

Seed - source, name ~~Silver Lake No 2~~ 89% viability

Treatment details Test period Mar 27 - June 3 1970

Date

Mar 27 8:00 AM Into 35°F after 24 hrs soaking @ 40°F

Germination record

Date	Sample No	Treatment ( ) No. of days	No. of seeds Total	Viable Calc	Germination 1/ Tips Percents	Complete Percents	Germination in treatment Percent
Apr 1	1	5	125	111	42	2	0
8	2	12	165	147	44	5	0
18	3	22	135	120	63	28	0
27	4	31	162	144	95	77	0
May 4	5	38	166	148	90	83	1
11	6	45	154	137	97	87	0
18	7	52	166	148	100	95	1
25	8	59	127	113	89	89	6 to 3mm
June 1 Last	9	63	393	350	99	100	

1/ In 7 days @ 68°F. Germination complete when root tip through seed coats.

(34)

Silver Lake No 2
H₂O bath

Experiment A,9,9 Strat @ 35°F Into 35°F (Cold room refrig, H₂O bath)

Jar Silver Lake No 2 1967 Seed. Started Mar 27 8:00 AM (0)

Date 1970	Time of day		Germ. time (days)	Tips Seed soaked 24 hrs @ 41°F lab. No.	Tips Cum.	Tips %	Tips Calc	Germination No.	Germination Cum.	Germination %	Strat. No. of days
34°F	Sample	(1)		(125)	(146 V)						
April 1	8:20A	out	0	0	0	0		0	0	0	(5)
" 2	8:00A		1	7	7			0	0	0	
" 3	9:30A		2	3	10			0	0	0	
4	—		3					—	—	—	
5	—		4					—	—	—	
6			5	22	32	41%		1	1		
7			6					1	2		
8	11:30A		7	15	47	147		0	2	2%	
	Sample	(2)		(165)	(140 V)				(End)		
April 8	11:00A	out	0	2	2			0	0	0	(12)
9	8:00A		1	26	28			0	0	0	
10	7:15A		2	24	52			2	2		
11	11:00A		3	6	58			4	6		
18	9:30A		4	7	65	44%		1	7	5%	
			5						(End)		
			6								
			7		120						
	Sample	(3)		(135)	(125 V)						
April 18	9:00A	out	0	20	20			0	0	0	(22)
" 25	10:30A		1	55	75	63%	144 tips 20	34	34	28%	
			2						(End)		
			3								
			4								
			5								
			6								
37°F			7		144	78%					
	Sample	(4)		(162)	(127 V)		1 non				
April 27	8:00A	out	0	64	64			0	0	0	(31)
" 28	8:00A		1	66	130		19 tips 4	23	23		
" 29	10:00A		2	4	134		56 tips	56	79		
" 30	7:30A		3	0	134		20 tips	20	99		
May 1	8:00A		4	1	135		10 tips	10	109		
2	9:00A		5	2	137	95%	2 tips	2	111	77%	
3			6								
4			7	0	137		0	0	111 (End)	87%	

30

Silver Lake No 2.
Jar H₂O bath

Experiment A, 9, 9 Strat 35°F Cold Room (2)
Started Mar. 27 8:00 AM (0)

Date	Time of day		Germ. time (days)	Tips No.	Tips Cum.		Germination No.	Germination Cum.	%	Strat. No. of days
37°F	Sample	(5)		(166 78%)	(129 V 148)					
May 4	8:30A	out	0	114	114		1	1		(38)
5	8:00A	}	1	10	124	72 tips 3 slip	75	76		
"	1:30P	}	2	4	128	7 tips	7	83		
6	9:00A	2	3	4	132	31 tips	31	114		
7	10:00A	3	4	0	132	tips	8	122		
8	9:00A	4	5	1	133		0	122	83	
9	8:00A	5	6	0	133. 90%	tip	1	123		
11	8:30A	7	7 Excised.	0	133 137		0	123	95%	
	Sample	(6)		(154 78%	120 V)	excise		End		(45)
		out	0							
May 11	9:00A	↓ 0	1 125 no tips 4 tips left	125	125		0	0	0	
12	7:45A	1	4	8	133	41 tips	41	41		
13	8:00A	2	3	0	133	tips	72	113		
14	1 PM	3	4	0	133	"	5	118		
15	9:00	4	5	0	133	"	1	119	87%	
16		5	6	0	133 97%		0	119		
18			7		148			End	99.2%	
	Sample	(7)		(166 89%	147 V)	excise				
May 18	8:00A	out	0 25 no tips 16 left	140	140		1	1 1%		(52)
19	7:00A		1 16 " "	8	148	100 tips 1 slip	101	102		to 10 mm
20	8:00A		2 15 " "	0	148	33 tips 1 slip	34	136		
21	7:30A		3	0	148	2 tips	2	138		
22	8:00A		4	1	149		0	138		
23	10:00A		5		100%	tips	1	139	99.3	95%
25			6							
		(8)	7		113	tips	2	141		
	Sample			(127 89%	102 V)	excise		End		(59)
May 25	8:00A	out	0	96	96		7	76	76% to 3 mm	
26	8:00A	}	1	4	100	76 tips 1 slip	77	84	Ave 5 mm to 10 mm	
26	3:00P	}	2	1	101	Tips	10	94		
27	7:30A	2	3 5 tips last cleaned	0	101	"	6	100		
28	7:30A	3	4	0	101	"	1	101		
29	8:00A	4	5	0	101		0	101	89%	
30	8:00A		6	0	101 89%		0	101		
31	8:00A		7	0	101		0	101	99%	
								(End)		

100
100
100

Jar

Experiment A, 9, 9 35°F (H₂O bath) Cold Room, Refrig

Date	Time of day	Germ. time (days)	Tips No.	Tips Cum.	Tips %	Germination No.	Germination Cum.	Germination %	No. of days
Temperature rose to 60°F about May 30 because refrig door not closed tightly. This sample shows max germination at 35°F start									
Lost	Sample	(9) 0	31 no tips left	393	90%	351 V	excise		
June 1	8:00 AM		40	40		350	322	322	(63) to 13mm
2	8:00 AM		3	43		tips	20	342	
3	7:30 AM		2	45		8 tips 1 sup	9	351	89.7%
						End			100%

Finished

Sample ____ 0 ( )( )

3 x 2
40
31
393

Sample ____ 0 ( )( )

Seed Dec 3 1970
Hormay

Experiment Summary

Exp. (A) G' Treatment Strat 35°F (S.F. refrig) (Petri)

Seed - source, name Silver Lake No 2
89% viability

Treatment details Test period Apr. 8 – July 22 1970

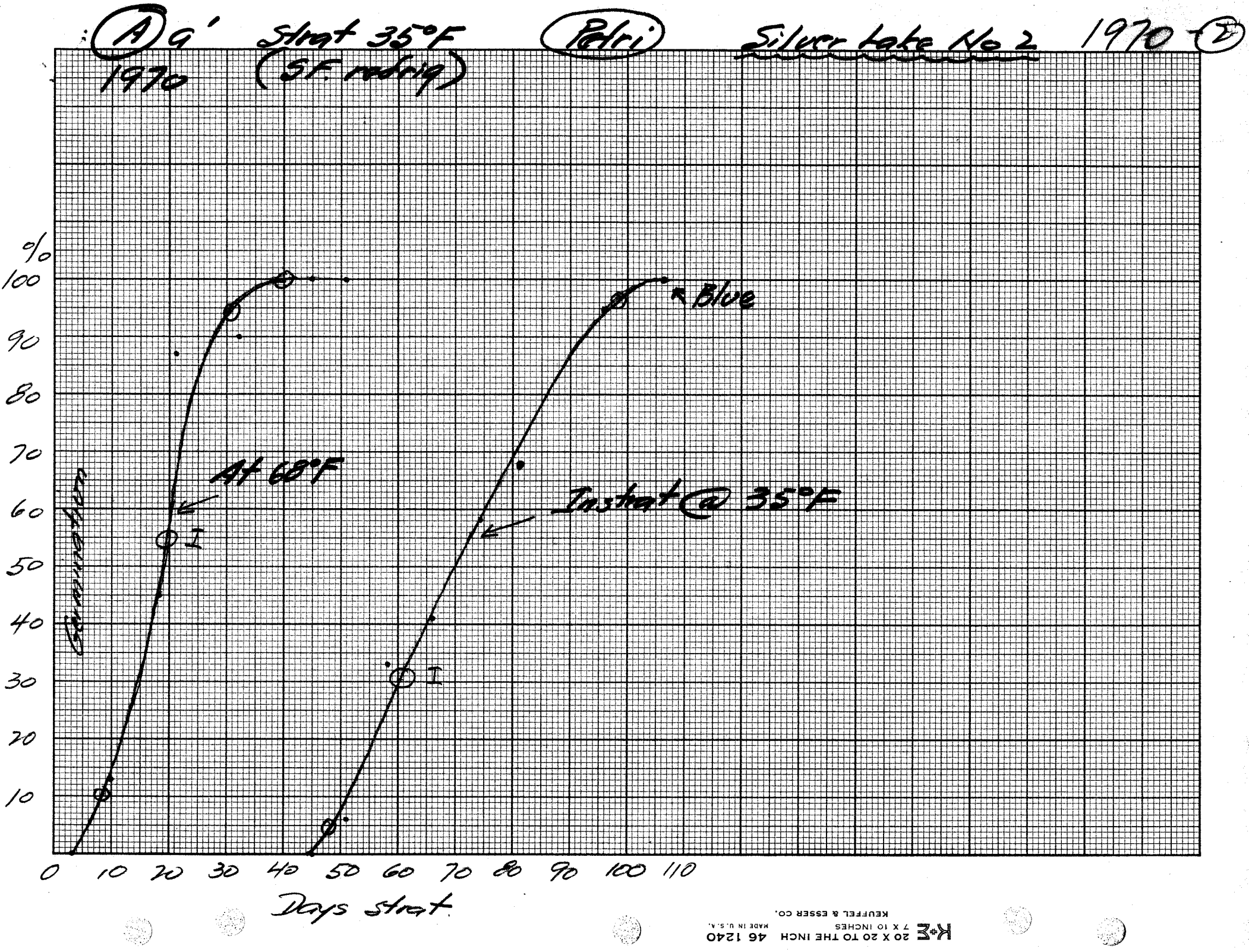
Date		
Apr 8	6AM	Seeds into strat after 24 hr soak 68°F Strat in Petri dishes

Germination record

Date	Sample No	Treatment (Strat) No. of days	No. of seeds Total	Viable ✓Basis (1)	Viable ✓Basis (2)	Germination 2/ Tips Percents	Germination 2/ Complete (1) Percents Cot	Germination 2/ Complete (1) Percents germ excise	Germination in treatment Strat. Percent (1)	Germination in treatment Strat. Percent (2)
Apr. 11	1	3	87	77	77	10	0	0	0	
18	2	10	81	72	76	60	13	12	0	
26	3	18	99	88	88	80	45	45	0	
May 4	4	26	101	90	92	100	87	85	0	
10	5	32	100	89	91	90	90	88	0	
17	6	39	93	83	86	100	100	99	0	
23	7	45	97	86	85	100	98	98	0	
29	8	51	99	88	85	100	95	99	6	6
June 5	9	58	91	81	85	100	100	99	33	32
13	10	66	90	80	83	100	100	100	41	40
21	11	74	88	78	84	100	100	100	58	54
28	12	81	86	77	79	100	100	100	68	66
July 12	13	95	90	80	79	100	100	100	95	96
" 22	Last (14)	105	148	132	140	100	100	100	100	100

✓Basis of viability 1. By calculation from average viability figure. This viability shown in pencil
2. By germination or excise. This shown in red

2/ In 7 days @ 68°F. Germination complete when root tip through seed coats.


A G' Start 35°F
1970 (SF mobrig)
Petri
Silver Lake No 2
1970
%
100
90
80
70
60
50
40
30
20
10
Cumulative
At 68°F
I
Blue
Instart @ 35°F
I
0 10 20 30 40 50 60 70 80 90 100 110
Days start
KEUFFEL & ESSER CO.
K&E 20 X 20 TO THE INCH 46 1240
7 X 10 INCHES MADE IN U.S.A.

Bitterbrush Germination Seed

Experiment (A) 9' Treatment Strat 35°F in Petri Location 101 Acadia SF

Seed: Name Silver Lake 162 Source _____ Collection date 1967

Viability: By excise 89 %. From this test _____ %. Germination @ 68° in Petri

Date 1970	Time of Day	Germ. time (days)	Tips (Cum) (No)	(%)	Germination (No)	(Cum)	(%)		No of Days Treat.
April 8	6AM	Seeds into Petri and 35°F after soaking 12 hours							0
						Calc	Cum		
			Sample (1)		(87)	(77)			
April 11	6AM	0 at 35°	4		0	0	0		3
18	7AM	7	8		0	0	0	(End)	
			Sample (2)		( )	( )			
		0							
			Sample		( )	( )			
		0							

89% viability

Petri dishes

Silver Lake No 2 Petri S.F

Experiment (A) a' Start @ 35°F 108 Monterey Blvd. 98

Petri dishes Silver Lake No 2 1967 seed started Apr 8 1970 6AM (0)

Date	Time of day		Germ. time (days)	Tips No.	Tips Cum.	Tips %	Strat Germination No.	Germination Cum.	Germination %	Strat. No. of days
	Sample (1)			(87)	(77 calc)					101 (3)
Apr 11	6:00PM	out	0	4	4		0	0	0	
18	7:00AM		7	4	8	10%	0	0	0%	
								(End)		
	Sample (2)			(81)	(76)	92 calc ✓	4 non			108 (10)
Apr 18	8:00AM	out	0	4	4		0	0	0	
" 19	9:00 AM		1	10	14		0	0	0	
" 26	8:00 AM		8	29	43	60%	9	9	13%	
								(End)		
	Sample (3)			(99)	(88 calc ✓)					116 (18)
Apr 26	9:00A	out	0	13	13		0	0	0	
28	4:30P	2	2	43	56		5 tips	20	20	
29	8:30A	3	3	2	58		15 3op 11 tips	11	31	
30	8:30 PM	4	4	12	70		8 tips	8	39	
May 3	3:PM	7	5	0	70	80%	1 tips	1	40	45%
			6					(End)		
			7			90 calc ✓				
	Sample (4)			(101)	(92 ✓)					124 (26)
May 4	6PM	out	0	46	46		0	0	0	
5	6PM		1	41	87		17 tips	17	17	
6	6PM		2	5	92		47 tips	47	64	
7	6 PM		3	4	96		9 tips 2 3op	11	75	
8	6 PM		4	1	97		1 tip	1	76	
9			5							
10	9:AM		6	0	97			0	76	
11	6AM		7	0	97	100	tip	2	78	87%
								(End)		

Petri

Experiment A'a' Strat @ 35°F 10° Monterey
Started Apr 8/70

Date	Time of day		Germ. time (days)	Tips No.	Tips Cum.	89% calc ✓	Germination No.	Germination Cum.	Germination %	Strat. No. of days
	Sample (5)			(100)	91% 91V	← excise				130 ✓
May 10	9 AM	out	0	65	65		0	0	0	(32) ✓
" 11	6 PM		1	900 tips left 14	79	32 tips 12 sup	44	44		Ave 3 1-6 mm
" 12	6 AM		2	0	79	tips	15	59		
13	6 AM		3	0	79	"	12	71		
13	6 PM		4	0	79	"	4	75		
14	6 PM		5	0	79		4	79	90%	
15	6 PM		6	1	80	90%	1	80		
17	9 AM		7	0	80	83 calc ✓	0	80	88%	
	Sample (6)			(93	92% 86V)			End		137
May 17	9.30A	out	0	74	74		0	0	0	(39) ✓
18	5.30A		1	800 tips left 8	82	42 tips	45	45		
18	4.30 P		2	6 " " 2	84	3 calc 35 tips	32	77		
19	6.00 P	2	3	6 " " 0	84	tips	8	85	100%	
20	6.00 P		4			100%	0	85	99%	
			5							
			6					(End)		
			7			86 calc ✓				
	Sample (7)			(97)	(85V)	excise				143 ✓
May 23	8:00 PM	out	0	79	79		0	0	0	(45) ✓
24	9:00 AM		1	1000 tips left 7	86	tips	15	15		Ave 1 mm
24	9:00 PM		2	9 " " 1	87	tips 38	38	53		
25	6:30 AM	2	3	0	87	tips	15	68		
25	9:30 PM		4	0	87	tips	11	79		
26	5:00 PM		5	6	87	tips	4	83		
31			6	0	87	100%	0	83	98% ✓	
			7			88 calc ✓		(End)		
	Sample (8)			(99)	(85V)					149
May 29	8:30 P	out	0	6 mil downcast 75	75		5	5	6%	(51) ✓
30	6:30 AM	1	1	5	80	tips	8	13		
30	6:30 PM		2	6	86	tips	42	55		
31	6:30 AM	2	3	1	87	tips	21	76		
31	6:30 PM		4	0	87	"	5	81	95	
June 1	5:00 PM	3	5	1	88	"	2	83		
2	7:30 PM	4	6	0	88	100%	1	84	99%	
			7					(End)		
7				(2)						

(18)

Experiment (A)a' Strat 35°F Petri (1) Monterey

Date		Time of day		Germ. time (days)	No.	Tips Cum.	%		Germination No.	Cum.	%	Strat. No. of days
		Sample	(9)		(91)	(85 V)		0 calc ✓				156
June	5	5:30 P	out	0	(5) 59	59		Sup	27	27		(58) ✓
	6	6:30 A	}	1	0	59		Tips	30	57		Ave 3mm
	6	6:30 P	}	2	2	61		"	23	80		
	7	6:30 A	} 24	3	0	61		"	4	84		
	7	6:30 P	}	4	0	61			0	84		
	13	9:00 P		5	0	61	100%		0	84	99%	
				6							100%	
				7				80 calc ✓ (End)				
		Sample	(10)		(90)	(83 V)		ex cne				164
June	13	9 PM	out	0	(2) 49	49		Sup	33	33		(66) ✓
	14	8:30 A		1	0	49			23	56		2-3mm
	14	8:30 P		2	0	49		2 Tips Sup	26	82		
	15	8:30 A		3	0	49		1 Tips	1	83	100% ✓	
				4			100%					
				5								
				6								
				7				78 calc ✓ (End)				
		Sample	(11)		(88)	(84 V)		Temp 72°-74°F				172
June	21	9:30 A	out	0	1 fungus 3 nat tips 39	39			45	45		(74) ✓
	21	3:30 P	1	1	↑ Nonviable	39 (end)			14	59		to 15mm Ave 5mm
	21	9:30 P		2		39			14	73		to 3mm
	22	6:00 A	2	3		0	100%		11	84	100% ✓	
				4					(End)			
				5	Thick gelatinous in dish on June 21 9:30A								
				6	No water added				← Also " 22 6:00A			
				7				77 calc ✓				179
		Sample	(12)		(86)	(79 V)						(81) ✓
June	28	8:00 A	out	0	(7) nat tips 27	27	100%		52	52		to 12mm
"			Hrs	1	All decayed or nonviable by							Ave 5mm
				2	insect injury or aborted radical.							
"	28	10:00 A	2	3					3	55		
"	28	1 PM	5	4					7	62		
"	28	4:30 P	8½	5					3	65		
"	28	6:30 P	10½	6	8 left				6	71		
"	28	10:00 P	14	7					8	79	100% ✓	
									(End)			

Silver #2

Experiment A4 Strat 35F Petri Monterey

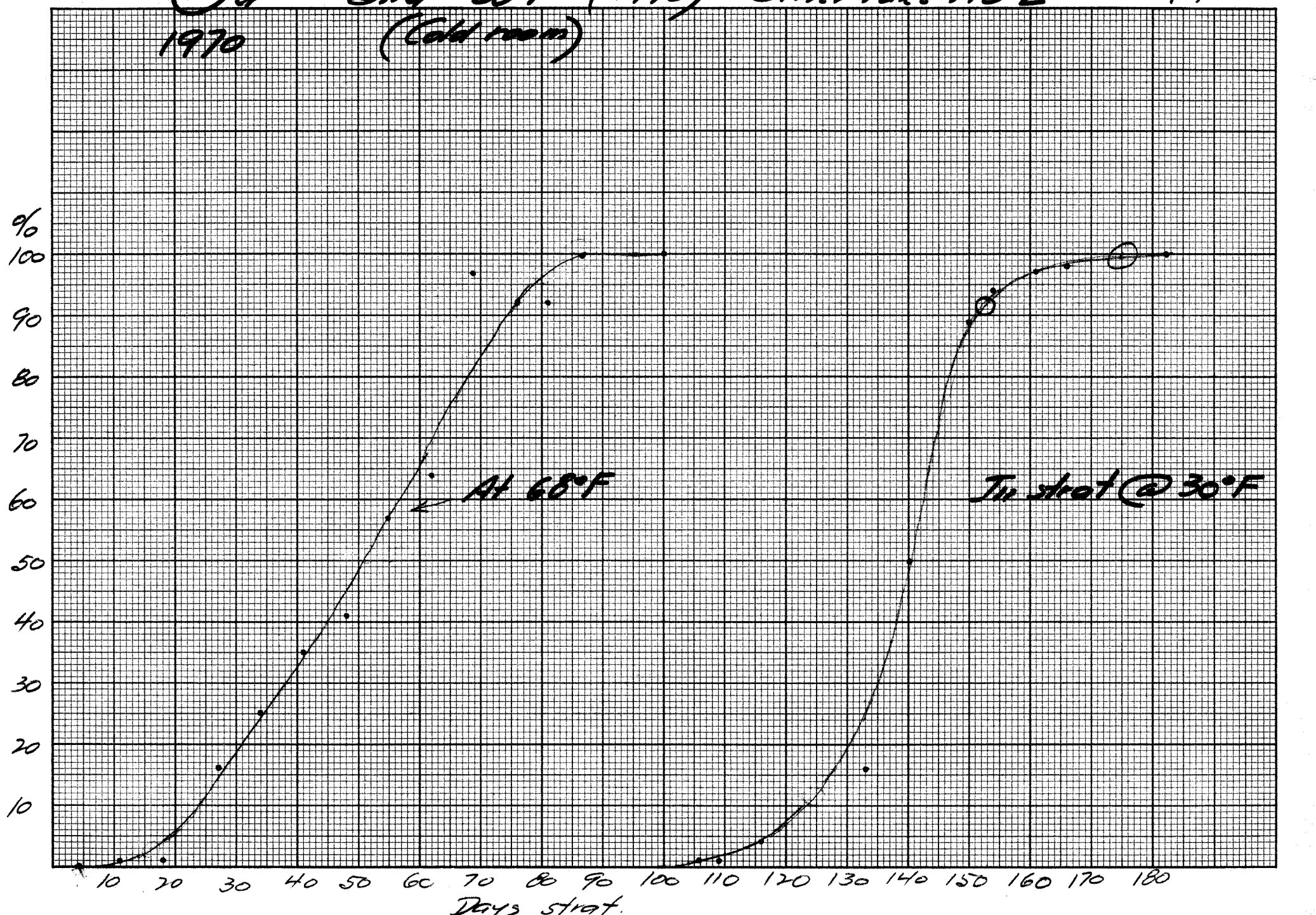
Date	Time of day	Germ. time (days)	No.	Tips Cum.	%	Germination No.	Cum.	%	No. of days
									193
		Sample 13		(90)		(80 ~~79~~ V)	excise		95
July 12	11:45A	0	1	1		76	76	to 16mm Ave 6mm	
" 13	6:00A					3	79		
							(End)	100%	
									203
		Sample 14		(148)		(132 ~~140~~ V)			105
July 22	6 PM	0				140	140	to 23mm Ave 11mm	
								100%	
		Sample ___		( )		( )			
		0							

K+E 20 X 20 TO THE INCH 46 1240
7 X 10 INCHES MADE IN U.S.A.
KEUFFEL & ESSER CO.

Not aerated

(A) G Strat 30°F (1970) Silver Lake No 2 1970

1970 (Cold room)



Dec 23 1970
Hornay

Experiment Summary

Exp. (A) 9 Treatment Strat 30°F (Cold room) Petri
Seed source, name Silver Lake #2 89 viability

Treatment details Test period Apr. 7 1970 - Oct 5 1970

Date 1970
April 7 3PM Into 30°F after 24 hour soaking

Germination record

Date	Sample No	Treatment (Strat) No. of days	No. of seeds Total	No. of seeds Viable Calc. ↓	Germination 1/ Tips Percents	Germination 1/ Complete Percents	Germination in treatment Percent
Apr 11	1	4	103	92	11	0	0
18	2	11	75	67	24	1	0
25	3	18	113	101	17	1	0
May 4	4	27	98	87	48	16	0
11	5	34	100	89	72	25	0
18	6	41	87	77	73	35	0
25	7	48	95	85	97	41	0
June 1	8	55	100	89	92	57	0
8	9	62	97	86	99	64	0
15	10	69	89	79	97	97	0
22	11	76	83	74	85	92	0
27	12	81	85	76	86	92	0
July 2	13	87	101	90	—	100	0
15	14	100	88	78	100	100	0
21	15	106	85	76	97	100	1
24	(16)	109	94	76	100		1
31	In strat	116					4
Aug 17		133					16
24		140					50
Sept 3		150					89
7		154					94
14		161					97

1/ In 7 days @ 68°F. Germination complete when root tip through seed coats.

24		171					98
Oct 5	↓	182					100

89% viability Silver Lake No 2 Petri

Experiment (A) 9 Strat @ 30F Cold Room

Petri disbcs Silver Lake No 2 1967 seed Started Apr. 7/70 3PM (0)

Date		Time of day		Germ. time (days)	Tips No.	Tips Cum.	Tips %	Germination No.	Germination Cum.	Germination %	Strat. No. of days
		Sample	(1)		(103 92v 92 corr)(95v)						
April	11	11:00AM	out	0	1	1		0	0	0	(4)
	18	10:00AM		1	9	10	11%	0	0	0% v	
				2					End.		
				3							
				4							
				5							
				6							
				7	92v	67					
		Sample	(2)		(75 89v)						
April	18	10:00AM	out	0	0	0	0	0	0	0	(11)
	25	10:00AM		1	16	16	24%	1	1	1% v	
				2					End		
				3							
				4							
				5							
				6							
				7	95v	101					18
		Sample	(3)		(113 102v)						(28)
April	25	10:00A	out	0	plumping 2 of malformed seed	2		0	0	0	
"	27	8:00A		1	6	8		1	1		
"	28	9:00A		2	1	9		0	1		
"	29	10:00A		3	4	13		0	1		
"	30	7:30A		4	4	17	17%	0	1		
May	1			5							
	2			6							
	3			7	4	93v 87			1	1% v	
		Sample	(4)		(98 94v)				(End)		
May	4	8:00A	out	0	Plumping malform 1	1		0	0	0	(27)
	5	8:00A		1	No tips 16	17		0	0	0	
	6	8:30A		2	or growth 11	28	tips	4	4		
	7	10:00A		3	yet 12	40	tips 3 sup 1	4	8		
	8	9:00A		4	0	40	tips 1 sup	2	10		
	9	8:00A		5	0	40	tips	3	13		
	10			6							
	11	8:00A		7	2	42	48% tips	1	14	16%	
									(End)		

Notice continual germination in 5-7 days in (5)

Silver Lake #2
Petri (2)

Experiment (A)a Start @ 30° Cold Room

Petri Silver Lake #2 Start Apr 7/70 3PM (0)

Date		Time of day		Germ. time (days)	Tips No.	Tips Cum.	Tips %		Germination No.	Germination Cum.	Germination %	Strat. No. of days
		Sample	(5)		(100)	(92V)	89					
May	11	8:30A	out	0	11	11			0	0	0	(34)
	12	7:30A		1	28	39			0	0	0	
	13	8:00A		2	5	44		Tips	6	6		
	14	1:00P		3	19	63		"	6	12		
	15	9:00A		4	0	63		"	1	13		
	16	10:00A		5	1	64	72%	7 tips 1 sup	8	21		
	17			6								
	18			7	0	64	77		2	23	25%	
		Sample	(6)		(87)	(83 & V)			End			
May	18	9:00A	out	0	8	8			0	0	0	(41)
	19	7:00A		1	33	41			0	0	0	
	20	8:00A		2	7	48		tips	3	3		
	21	7:00A		3	5	53		tips	13	16		
	22	8:00A		4	3	56	73%	6 tips 2 sup	8	24		
	23	10:00A		5				1 tips 1 sup	2	26		
	24			6								
	25	7:30A		7		95	85	1 sup 14 tip	2	28	35%	
		Sample	(7)		(95)	(82V)		excise				(48)
May	25	7:30A	out	0	2 plumb 21 grill 23	23			0	0	0	
"	26	7:30A		1	43	66		tips	5	5		Ave 1-2 mm
"	26	3:00P		2	5	71		"	3	8		
"	27	7:30A	2	3	1	72		"	5	13		
"	28	7:30A	3	4	4	76		"	14	27		
	29	8:00A	4	5	4	80	97%	"	3	30		
	30	8:00A	5	6	2	82		"	1	31		
	31	8:00A	6	7	1	83						
June	1	8:00A	7		0	83	89		5	36 37	41%	
		Sample	(8)		(100)	90	(82V)	excise				
June	1	8:00A	out	0	31	31			0	0	0	(55)
	2	8:00A		1	34	65			1	1		
	3	7:30A		2	15	80		6 tips	6	7		
	4	7:15A		3	1	81		23 tips	23	30		
	5	9:45A		4	0	81		tips	14	44		
	6	9:30A		5	0	81		"	4	48		
	8	9:00A		6	1	82	97%	"	3	51	57%	
				7								

M = Heavily moulded and soft decayed.

12

Silver #2 (4) (3)

Experiment (A) 9 Strat 30°F Petri

Date		Time of day		Germ. time (days)		Tips No.	Tips Cum.	%		Germination No.	Germination Cum.	Germination %	Strat. No. of days
		Sample	(9)		(97)		(76)	78 86	cst count				
June	8	9AM	out	0	# fungi 44 tips	49	49			0	0	0	(67)
	9	7:30A		1		23	72			3	3		to 2mm
	10	10:00A		2		9	81			32	35		
	11	7:30A		3		4	85		13 tips 1 fungus Hvy →	14	49	64%	
	15	7:00A		4		0	85	99%		6	55	~~72%~~	
				5							(End)		
				6									
				7				93	79				
		Sample	(10)		(89)		(83 V)						
June	15	7:30A	out	0	(35)	54	54			0	0	0	(69)
	16	7:30A	1	1	(12)	17	71		4 tips 1 g 5 tips 6	25	25		to 3mm
	16	2:30P		2		1	72		4 tips	25	50		to 3mm
	17	12:30P	2	3	(7)	4	76			20	70		
	18	3PM	3	4		1	77			5	75		
	19	8AM	4	5				97%		1	76	97%	
	20	9AM	5	6						1	77	~~93%~~	
	22	7AM		7				86	74				
		Sample	(11)		(83)		(71 V)				(End)		
June	22	7:30A	out	0	22 tooth 6 fungi	55	55			0	0	0	(76)
	23	7:30A		1	14	6	61		37 tips 8 sp 13 tips 1 sp	45	45		
	24	9AM		2		2	63			14	59	92%	
	25	8AM		3		0	63			9	68	~~96%~~	
				4				85%					
				5							(End)		
				6									
				7				87	76				
		Sample	(12)		(85)		(74)		exclude				(81)
June	27	8AM	out	0	(18) 6 fungus no tips	59	59			0	0	0	
				1									
June	29	9:20		2	(11)	4	63			70	70		
✓	30	8:40		3	(10)	1	64			0	70		
July	1	9AM		4	(18)	0	64			0	70		
	2	8:35		5		1	65			0	70	92%	
	6	10:30		9 6		0	65	86%		0			
											(END)		

13

Silver #2

Experiment (4a) Strat 30°F Petri (4)

Date		Time of day		Germ. time (days)		Tips No.	Tips Cum.	Tips %		Germination No.	Germination Cum.	Germination %	No. of days
								94	90				87
			Sample (13)				(101)		(~~96~~) excise				(88)
5 July	2	8:45A		0	out wetted into 68° germ.								
	6	10:35A		4	(10)	5	5				86	86	
	7	9:35AM		5	(5)	1	6		TIP 3 SUPR		5	91	100%
	8	9:00AM		6	(0)	0	6				0	91	
	9	9:15A		7		0	6				0	91	96%
									(END)				
								87	78				100
			Sample (14)				(88)		(~~77~~ V) excise				(99)
July	15	8:30A		0	(18)	70	70				0	0	
	16	9:30A		1	(7)	8	78		11 tips 4 sup		46	46	
	20			5							30	76	
	21	8:30A		6				100%	11 tips		1	77	100%
									(End)				
		Last						93	76				106
			Sample (15)				(85)		(~~79~~ V) excise				(105)
July	21	8:30A		0	(11) tips (7) sup	72	72				1	1	
	22	1:30P				2	74		64 tips 4 sup		68	69	
	23	3PM									6	75	
	24	8AM						97%			4	79	100%
									(End)				

Silver #2

Experiment (A)g strat 30 Petri (5)

Date	Time of day	Germ. time (days)	No.	Tips Cum.	%	No.	Germination Cum.	%	No. of days
Instrat			Final						
	Sample (16)			(94)	(76 V)				
July 24	8AM	0	76	76	100%	1	1	1	
31	9AM		0	76		2	3	4	
Aug 17	11AM	(18)	0	76		9	12	16	
24	11:45A		0	76		76	38	50	
Sept 3	8AM	(9) Lost→	1	77		30	68	89	
7	7:30		0	77		4	72	94	
14	8:30		0	77		2	74	97	
24	8AM		0	77		1	75	98	
Oct 5	8AM		0	77		1	76	100	
	Sample ____	0		( )	( )				
	Sample ____	0		( )	( )				

K+E 20 X 20 TO THE INCH 46 1240
7 X 10 INCHES MADE IN U.S.A.
KEUFFEL & ESSER CO.

Hot aerated

A, 9 Strat 30°F 1969-70 Swansville Summit 1970

(Cold Room) Petri



Dec 23, 1970
Harmon

Experiment Summary

Exp. A,9 Treatment Strat 30°F (Cold room) (Petri)

Seed - source, name Susanville Summit 99% viability

Treatment details Test period Dec 24 1969 - May 18, 1970

Date

Dec 24, 1969 Seeds soaked 4 hours Then into 30°F strat.

Germination record

Date	Sample No	Treatment (Strat.) No. of days	No. of seeds Total	Viable	Germination 1/ Tips Percents	Complete Percents	Germination in treatment Percent
Dec 25 1969	1	1	100	100	2	0	0
26	2	2	106	106	4	2	0
28	3	4	114	113	18	3	0
Jan 1 1970	4	8	118	116	53	8	0
5	5	12	103	102	52	6	0
8	6	15	115	114	72	17	0
12	7	19	This sample Thrown out				
15	8	22	118	117	88	31	0
19	9	26	121	121	91	97	0
22	10	29	115	115	90	87	0
29	11	36	114	96	Throw out		
Febr 5	12	43	118	102	"	"	
11	13	49	111	108	100	94	0
22	14	60	121	115	99	98	0
Mar 2	15	68	114	114	100	100 in 40 hrs	0

See page 2 for germination during stratification

1/ In 7 days @ 68°F. Germination complete when root tip through seed coats.

Experiment Summary

Exp. A, 9 Treatment Strat 30°F

Seed - source, name

Treatment details

Date

Germination record

Date	Sample No	Treatment (Strat) No. of days	No. of seeds Total	Viable	Germination 1/ Tips Percents	Complete Percents	Germination in treatment Percent	
	(20)	In stratification record						
March 6			131	129				
" 6		72			First about to germ		0	Ave
25		91					1	1mm
28		94					2	2mm
30		96					4	
Apr 8		105					17	3mm
18		115					46	4mm
25		122					74	4
29		126					84	5
May 1		128					88	6
4		131					96	7
11		138					98	10
13		140					98	
18		145					100	11

1/ In 7 days @ 68°F. Germination complete when root tip through seed coats.

Exp A, 9 (1) Jus. Summit Petri

(H02) Exp 1-70 Strat @ 30°F (Cold room refrigerator at first then 30°F)

Date	Time	Sample No.	Germination Days ± Hrs		Tips			Germination			Strat
		Seeds	Soaked 11:00A	- 3:00P	No	Com	%	No	Com	%	days + (0)
~~Dec 24 1969~~											
" 25 "	11:30A	(1) out	- 0		0	0	0	0	0	0	(1) 21 hrs
26	9:30A	100	100V	22	0	0	0	0	0	0	
27	8:00A			2	0	0	0	0	0	0	
28	9:00A			3	0	0	0	0	0	0	
29	9:00A			4	1	1	1	0	0	0	
30	9:00A			5	0	1	1	0	0	0	(End)
31	9:00A			6	0	1	1	0	0	0	
Jan 1	9:00A			7	1	2	2%	0	0	0%	
Dec 26 1969	10AM	(2) out		0	0	0	0	0	0	0	(2)
27	8AM	106	106V	1	0	0	0	0	0	0	
28	9AM			2	0	0	0	0	0	0	
29	9AM			3	0	0	0	0	0		
30	9AM			4	0	0	0	0	0		
31	9AM			5	0	0	0	1	1	2%	
Jan 1	9AM			6	1	1		0	1		
2	9AM			7	3	4	4%	1	2	(End)	
Dec 28	9AM	(3) out		0	0	0	0	0	0	0	(4)
29	"	114	113V	1	0	0	0	0	0	0	
30	"			2	0	0	0	0	0	0	
31	"			3	0	0	0	0	0	0	
Jan 1 '70	"			4	3	3		1	1		
2	"			5	2	5		1	2		
3	"			6	15	20		1	3	3%	
4	"			7	0	20	18%	0	3		
5					10	30		0	3	(End)	
Jan 1 '70	9AM	(4) out		0	0	0	0	0	0	0	(8)
2	"	118	116V	1	6	6		0	0	0	
3	"			2	15	21		7	7		
4	8AM			3	7	28		2	9		
5	9AM			4	23	51		0	9		
6	8AM			5	2	53		0	9	8%	
7	9:00A			6	6	59		0	9		
8	10:00A			7	2	61	53%	0	9	(End)	

(1)

Exp A, 9

(Nov) Exp 1-70 Start @ 330F Cont'd

Date	Time	Sample No	Germination		Tips			Germination			Start
	(103)	(107)	Days		No	Com	%	No	Com	%	days
Jan 5 1970	8:00A	(5) out	0	0	0	0	0	0	0	0	(12)
6 "	8:00A		1		20	20		0	0	0	
7 "	9:00A		2		10	30		4 trip 1 sup. 5	5		
8	10:00A		3		6	36		0	5		
9	8:30A		4		6	42		1	6		
10	10:30		5		5	47		0	6		
11	8:00		6		5	52	57%	0	6		
12	8:00		7		1	53		0	6	6%	
						(End)					
		Sample	(6)		(115)	(114)					
Jan. 8	9:30A	out	0		7	7		0	0	0	(15)
9	8:30		1		57	64		sup 3	3		
10	10:30		2		6	70		12	15		
11	8:00		3		4	74		2	17		
12			4		4	78		2	19		
13	8:55		5		0	78		0	19		
14	9:00A		6		4	82	72%	0	19		
15	7:30A		7		0	82	(End)	0	19	17%	
		Sample (7)			(125)						
Jan 12	8:00	out Frozen	0		Prob plumbing	8	0	0	0	0	(19)
" 13	8:00		1		31	39		0	0	0	
14	9:00A		2		28	67		2	2	0	
15	7:30A		3		5	72		0	2	0	
16	9:00A	Throw out	4		11	83		2	4		
17	8:45A		5		6	89		0	4		
18	8:30A		6		2	91		0	4		
19	10:30A		7		0	91	(End)	0	4		

Exp A, 9 Strat @ 32°F (3)

Date 1970	Time of day	germination Time (Days)	Tips No	Tips Cum	Tips %		Germination No	Germination Cum	Germination %	Strat (days)
	Sample	(8)	118		117 V					
Jan 15	7:20A out	0	27	27			0	0	0	(22)
" 16	9:00A	1	48	75			4	4		
" 17	8:30A	2	10	85			5	9		
" 18	8:30A	3	5	90		Tips	18	27		
" 19	10:50A	4	4	94		"	8	35		
" 20	7:30A	5	5	99	88%	(End)	0	35		
" 21	6:30A	6	3	102 / 103		Tips	1	36	31%	
22	7:00A	7	1				0	36		
	Sample	(9)	121		121 V	excise				
Jan 19	11:10A out	0	50	50			0	0	0	26
" 20	7:30A	1	58	108		Tips 4 Sup 1	5	5		
" 20	4:30P		0	108		Tips	52	57		
" 21	6:30A		1	109		Tips	46	103		
21	4:00P	2	0	109		"	8	111		
22	7:00A	3	0	110		"	6	117		
23	9:30A	4	0	110		"	1	118		
24 & 25	8:00A	5 & 6	0	110	91%		0	118 V	97%	
26	8:00A	7	0	110			0	(End)		
	Sample	(10)	115		115 V	excise				
Jan 22	7:10A out	0	53	53			0	0	0	29
" 23	9:30A	1	43	96		19 Tips 7 Sup	26	26		
" 24	8:00A	2	5	101		63 Tips 1 Sup	64	90		
" 25, 26, 27	7:00A	3, 4, 5	2,0,0	103		Tips	10,0,0	100		
" 28	7:00A	6	0	103			0	100		
29	7:00A	7	0	103 V	90%		0	100 V (End)	87%	
	Sample	(11) V	114		96 V	excise				
Jan 29	7:40A	0	42	42			0	0	0	36
" 30	6:45A	1	55	97			0	0	0	
" 31	6:30A	2	12	109			34	34		
31	11:30A		0	109			17	51		
Febr 1	7:30A	3	1	110			17	68		
" 2	7:40A	4	0	110			10	78		
" 3	7:35	5	0	110			1	79		
4	7:20A	6	0	110			1	80		
5	7:00A	7	0	110			0	80 V	83%	

V this sample probably affected by freezing (End)

Sample 12 Febr 5 ; #13 Febr 12

16
NV 20V B2

Experiment A,9 Strat @ 32°F (4)

Date		Time of day		Germ. time (days)	Tips No.	Tips Cum.	Tips %	Germination No.	Germination Cum.	Germination %	Strat. No. of days
		Sample	(12)		(118)	(102 V)		Seeds in this sample may have been frozen. Considerable black soft tips			
Febr	5	7:30A	out	0	85	85		0	0	0	43
	6	6:30A		30 hrs	26	111		Tips→ 2	2		43
	6	4:00P			3	114		" 4	6		
	7			2	2	116		" 20	26		
	7	11:30A			3	119		" 16	42		
	8	6:45A		3	0	119		18	60		
	8										
		[redacted]	[redacted]		( )	( )					[redacted]
			out								
	9	6:45A		4	1	120		" 13	73		
	9	3:30P			1	121		4	77		
	10			5	0	121		5	82		
	11			6	0	121		0	82		
	12			7	0	121		0	82	82%	
								(End)			
		Sample	(13)		(111)	(108 V)		— old			48
Febr	11	7:20	out		103	103		0	0	0	[redacted]
"	11	2:20	7 hrs		5	108		0	0	0	
"	12	7:45A	1 = 31 hrs		1	109		20 tips 1 sep 21	21		49
"	12	3:00P	2		Last		100%	Tips 32	53		94
"	13	7:00A	3					" 44	97		108/10 x 0
"	14	6:30A	4					" 5	102		97 2
"	21	4:20P	11					0	102	94%	480
								(End)			
		Sample	(14)		(121)	(115 V)					
Febr	22	9:30A	out	0	113	113		0	0	0	60
"	23	8:20A		1	Last → 1	114		67 tips 1 sep 68	68		
"	27	10:45A		5	0	114		44 1 45	113		
"	28	8:00A		6	0	114		0	113		
Mar	1	9:00A		7	0	114		0	113		
"	2	9:00A		8	0	114	99%	0	113	98%	
					Two Tips left.						
								(End)			

Last to germinate

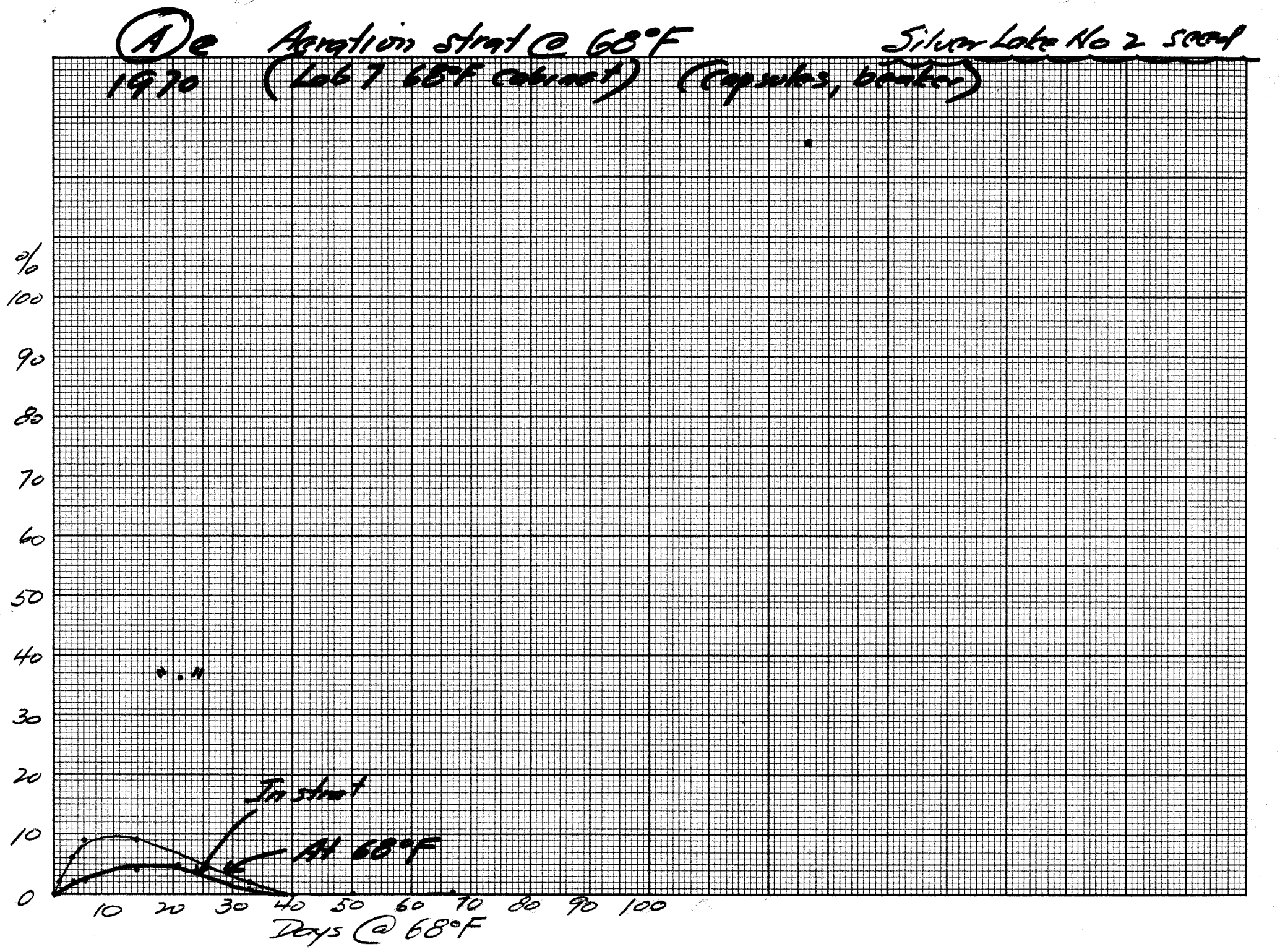
Experiment A,9 Strat @ 30°F (5)

Date	Time of day		Germ. time (days)	Tips No.	Tips Cum.	Tips %	Germination No.	Germination Cum.	Germination %	Strat. No. of days
Last →	Sample	(15)		(114)	(114 ✓)					(68)
Mar 2	9:00A	out	0	→ 112	112		0	0	0	
" 3	8:00A		1	2	114		53	53		
" 3	2:00P		2 (30hrs)	Prominent tips		100%	31 tips 2 sap	33	86	
				(Probably 100% germination in 40hrs)						
" 4	9:00A	2 days	3				All tips	28	114	100%
			4							2-10mm
			5							
			6							
			7							
							(End)			
	Sample	___		( )	( )					
		out	0							
			1	At 30°F "maximum" conditioning of						
			2	seed for germination. At 41°F						
			3	a few "stubborn" seeds remain						
			4	unconditioned. Note speed of						
			5	germination at 30°F strat compared						
			6	with 41°F strat. At 30°F seeds						
			7	leaked - Compare with 27°F strat.						
	Sample	___		( )	( )					
		out	0							
In strat from now on. One sample left. (20)			1							
			2							
March			3							
			4	See page (6)						
			5							
			6							
			7							
	Sample	___		( )	( )					
		out	0							
			1							
			2							
			3							
			4							
			5							
			6							
			7							

In strat germination

Experiment A, a Strat @ 30°F Sus Sum (6)

Date	Time of day		Germ. time (days)	Tips No.	Tips Cum.	Tips %	Germination No.	Germination Cum.	Germination %	Strat. No. of days
Only →	Sample	(20)		(131)	(129 ✓)		All germinated left			
also last		out	0				in dish for growth measure			
March 6	8:00A		1	128	128		First seed about to germ.			
" 7	10:00A		2	0	128		0	0	0	
" 8	8:00A		3	0	128		0	0	0	
" 10	8:30A		4	0	128		0	0	0	
" 12	8:30A		5	0	128		0	0	0	
" 14	9:00A		6	0	128		0	0	0	
" 24	9:00A		7	0	128		0	0	0	
" 25	Sample	"		(0)	(128)		1	1	1	1mm
" 26	8:00A	out	0	0	128		0	1		
" 28	10:20A		1	1	129 +1		2	3	2	2mm
" 30	11:45A		2	End 1 seed excised			2	5	4 →	2-3mm
April 2	8:00A		3	March 6. found viable			0	5		" " "
" 8	8:00A		4				17	22	17	3-4 "
" 18	9:00A		5	(End)			37	59	46	3-5 "
" 25	10:00A		6				37	96	74	3-5 "
"			7	Growth recorded on these 5						
	Sample			( )	( )					
		out	0	shortest & longest roots						
" 29	9:00A		1		21 left all tips		12	108	84	4-9 "
May 1	8:00A		2		16 " " "		5	113	88	5-9
4	8:00A		3		5 " " "		11	124	96	6-10
6	8:00A		4		4 " " "		1	125	97	
11	9:00A		5	seeds to new dish	3 " " "		1	126	98	9-11
13	9:00A		6		2 " " "		1	127	98	
18	9:00A		7		0 " " "		2	129	100%	10-13
	Sample			( )	( )					Ave growth all seeds 11mm
		out	0			(End)				
			1							
			2							
			3							
			4							
			5							
			6							
			7							


Ae Aeration strat @ 68°F
Silver Lake No 2 scow
1970 (Lab 7 68°F cabinet) (Capsules, bentos)
%
100
90
80
70
60
50
40
30
20
10
0
10 20 30 40 50 60 70 80 90 100
Days @ 68°F
In strat
At 68°F

(A) C' Acration Strat @ 68°F

Checks (Lab 7 68°F cabinet)

Silver Lake No 2

1970 Test period June 12 - Aug 17

June 12 9AM Seeds into capsules and into beaker @ 68°F

Date	Sample No	Strat days	Germination @ 68°F % start	Instrat %	Seeds Viable No
June 12	0	0	start		
13	1	1	2	0	92
15	2	3	6	2	109
17	3	5	9	2	105
26	4	14	9	4	114
July 2	5	21	"36"?	5	113
14	6	33	2	1	101
21	7	40	0	0	110
31	8	50	0	0	108
Aug 17	9	End. 67	0	0	160

Practically all seed dead by now

Experiment (A) e' Aeration strat 68°F Silver Lake No 2 seed

Date	Time of day	Germ. time (days)		No.	Tips Cum.	%		Germination No.	Cum.	%	No. of days
June 12	9AM	Seeds into capsules, jar, H_2O & 68°F (start)									(0)
		Sample (1)			(103)		Calc (92)				
June 13	9AM	0		8	8			0	0	0%	(1)
15	9AM	2		11	19			0	0	0	
16	8:44M	3		3	22			0	0	0	
18	3PM	5		4	26		tips	1	1		
19	8:30A	6		5	31		"	1	2		
20	9AM	7	(64)	8	39			0	2	2%	
								(End)			
		Sample (2)			(122)		(109)				
June 15	9AM	0		23	23		Sup	2	2	2%	(3)
16	8AM	1		3	26		tips	1	3		
18	3PM	3		3	29			0	3		
19	8:30A	4		4	33			0	3		
20	9:30A	5		11	44			0	3		
22	9AM	7	(46)	10	54			3	6	6%	
								(End)			
		Sample (3)			(118)		(105)				
June 17	1PM	0		22	22		Sup	2	2	2% to 4mm	(5)
18	3PM	1		5	27		tips	1	3		
19	8:30A	2		5	32		"	2	5		
20	9:30A	3		12	44		"	2	7		
22	9AM	5		6	50			0	7		
23	8AM	6	(63)	3	53			0	7		
24	9AM	7		2	55		Hips Sup	2	9	9%	
								(End)			

Experiment (A) C' Aeration 68°F (2)

Date		Time of day		Germ. time (days)		Tips No.	Tips Cum.	Tips %	Germination No.	Germination Cum.	Germination %	No. of days
									114			
			Sample	(4)		(128)			(106)			(14)
June	26	10:00 AM		0	(58) 5 cotton	61	61		4	4	4%	
	27	9 AM		1		0	61		0	4		
	29	11 A		3		17	74		4	8		
✓	30	10 Am		4		13	87		tip 1	9		
July	1	9:30 AM		5		2	89		0	9		
	2	9:50 A		6		0	89		TIP 1	10		
	6	10:00 AM		10		0	89		tip 1	11	9%	
									(End)			
									113	(21)		(20)
			Sample	(5)		(127)			(TOO)	EXCUSE		
5 July	2	10:00 AM		0	(45)	77	77		5	5	5%	
	6	10:30 AM		4		17	94		2 sup 23 tip 25	30		
	7	9:00 AM		5	(24)	2	96		TIP 6	36	"	36% "?
	8	9:05 AM		6	(22)	2	98		TIP 5	41		
										(68)	? How will this decay? glossy	
									(END)			
											(33)	(3+)
			Sample	(6)		(113)			(101)			
July	14	10:30 A		0	(35)	77	77		1	1	1%	
	15	9:00 A				0	77		0	1		
	16	10:00 A				1	78		0	1		
	20	9 AM				0	78		1	2		
	21	9:30 A				0	78		0	2	2%	
						5 more germ but glossy dicot						
									(End)			

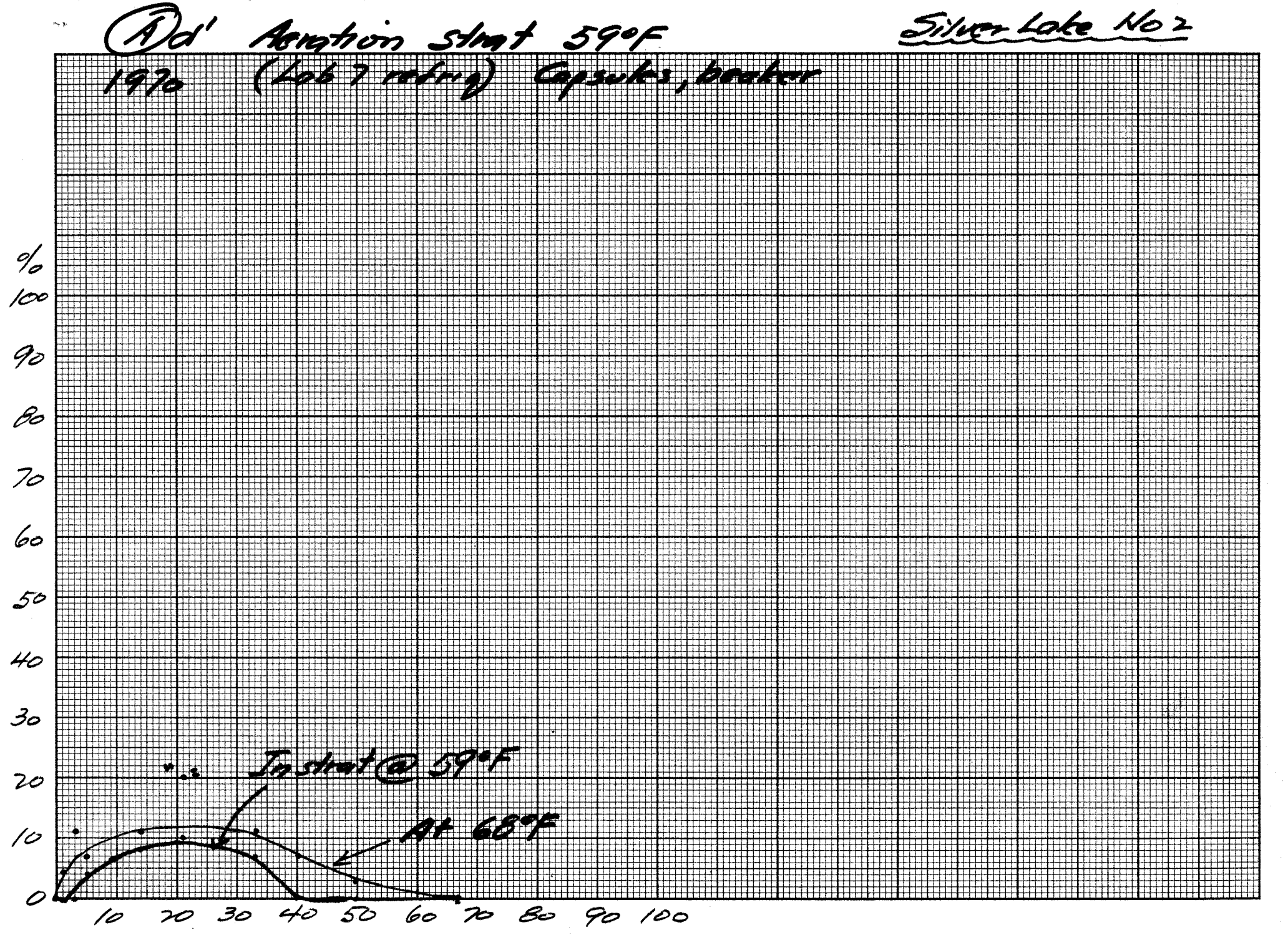
Experiment (4e' Aeration 68°F

Date	Time of day	Germ. time (days)	Tips No.	Tips Cum.	Tips %	Germination No.	Germination Cum.	Germination %	No. of days
		Sample (7)	(124)	(110)	0%				40 (38)
July 21	9:30A	0				3	3		to 40mm mainly hypo Roots buried plastic. Will die
23						0	0		
24	8AM					0	0		Healthy
31	10AM					4	7		But dead
			All that germinated died						
			(End)		0%				
		Sample (8)	(121)	(108)	0%				50 (49)
July 31	10AM	0	Many tips			7	7		to 15mm but all dead
Aug 3	8:30A					0	0		
7			Some germ but glassy Would not live						
17			All dead.			0	0		
			(End)		0%				
Last		Sample (9)	(180±)	(160)	0%				(67)
Aug 17	1PM	0				7	7		But dead
19	8AM					0	7		All appear dead
20	10AM					0	7		" " "
24	12 noon	7	All appear dead			0			
			Back 40° Strat						0%
			(End)						
			Finish						

Ad' Aeration start 59°F

Silver Lake No 2

1970 (Lab 7 mdrg) Capsules, broken



Silver Lake No 2

(A) d' Aeration strat 59°F (Lab) refrig (Capsules in beaker)

1970

Test June 12 to Aug 24

Date	Sample No	Strat Days	Germination At 68°F %	In strat %	Tips %	No seeds Viable
June 13	1	1	4	0		173
15	2	3	11	0		111
17	3	5	7	4		113
26	4	14	11	8		109
July 2	5	21	20 Horm?	10 Normality?		72
14	6	33	11 "	7 "		106
21	7	40	7 "	0		100
31	8	50	3	0		117
Aug 17	9	67	0	0		142

Silver #2

Experiment (A) d' Aeration start 59°F Lab refrig

Date		Time of day	Germ. time (days)		No.	Tips Cum.	%		Germination No.	Cum.	%	No. of days
June 12		9AM	Seeds into capsules jar H2O @ 59°F (start)									(0)
			Sample (1)			(138)		(173)				
June	13	9AM	0	side	2	2			0	0	0%	(1)
	15	8:30A	2		13	15		14 tips 3 sup	4	4		
	16	8:00A	3		7	22			1	5		
	19	8:00A	6		14	36			0	5		
	20	9A	7	(91)	8	44			0	5	4%	
									(End)			
			Sample (2)			(175)		(111)				
June	15	9:45A	0	Many side	27	27			0	0	0%	(3)
	16	8:00A	1		5	32		11 tips 2 sup	6	6		
	17	1PM	2		8	40			6	12		
	19	8:00A	4		10	50			0	12		
	20	9:00A	5		7	57			0	12		
	22	9:00A	7	(61)	0	62			0	12	10%	
									(End)			
			Sample (3)			(127)		(113)				
June	17	1PM	0		40	40		Sup	4	4	to Germ 4%	(5)
	18	3PM	1		18	58		Tips	3	7		
	19	8AM	2		3	61		"	1	8		
	20	9AM	3		8	69			0	8		
	22	9AM	5	(46)	8	77			0	8		
	23	8AM	6		0	77			0	8		
	24	9AM	7		0	77			6	8	7%	
									(End)			

Experiment (A) d' Aeration 59°F (2)

Date		Time of day	Germ. time (days)		No.	Tips Cum.	%		Germination No.	Cum.	%	No. of days
								109				
Sample			(4)	27 cotton		(173)		(99)				(14)
June	26	8AM	0	(35)	52	52		sup	9	9	8%	to 30mm
	27	9AM	1		0	52			0	9		
	29	11 AM	3		24	76			0	9		
✔	30	10AM	4		1	77		tip	1	10		
July	1	9:30 AM	5		0	77			0	10		
	2	9:30A	6		0	77		tip	2	12		
	6	9:30 AM	10		4	81		tip	1	13	11%	
								(End)				
								72				
Sample			(5)			(81)		(78)		excise		(21)
5 July	2	9:45A	0	(20)	54	54			7	7	10%	
	6	10:00AM	4		3	57		sup 1 tips	6	13		
	7	8:50AM	5	(15)	2	59		TIP	1	14		
	8	9:05AM	6	(13)	0	59		TIP	1	15	20%	
						(END)						
												33
Sample			(6)			(119)		(106)				(32)
July	14	10:00	0	(29)	83	83			7	7	7%	
	15	9AM			0	83			0	7		
	16	10AM			4	87		3+ tips	3	10		
	20	9AM			0	87		tips	2	12		
	21	9AM	7		0	87			0	12	11%	
						several more germ. glassy						
						(End)						

Experiment (A) d' Acadian 59°F (3)

Date	Time of day	Germ. time (days)	Tips No.	Tips Cum.	Tips %	Germination No.	Germination Cum.	Germination %	No. of days
		Sample (7) 0		(117)(100)					(40)
									(To 50 mm in Calc)
July 21	9AM	(36)	66	66 37		10	100	100%	(39)
									Curls expanded All now glassy dead
23	3PM					3	3	Healthy	
24	8AM					3	6	" "	
31	10AM					1	7	" "	70%
				(End)					
		Sample (8) 0		(132)(117)					(50)
July 31	9AM					13	13	13 of 19 dead	12-50mm
Aug 3	8:30 A					2	15	Healthy	
7	3PM					1	16	" "	4
17	11AM					4	20	But now dead	
		Only 3 healthy. The rest dead glassy							3%
		Last → Sample (9) 0		(160±)(142)				0%	(67)
Aug 17	1PM					20	20		Now All dead
" 19	8:00					0	20		appear about dead.
20						24	44		Glassy left in dish
24	12noon	Only 1 about normal to date							
		Back into Strat 40°F							0%

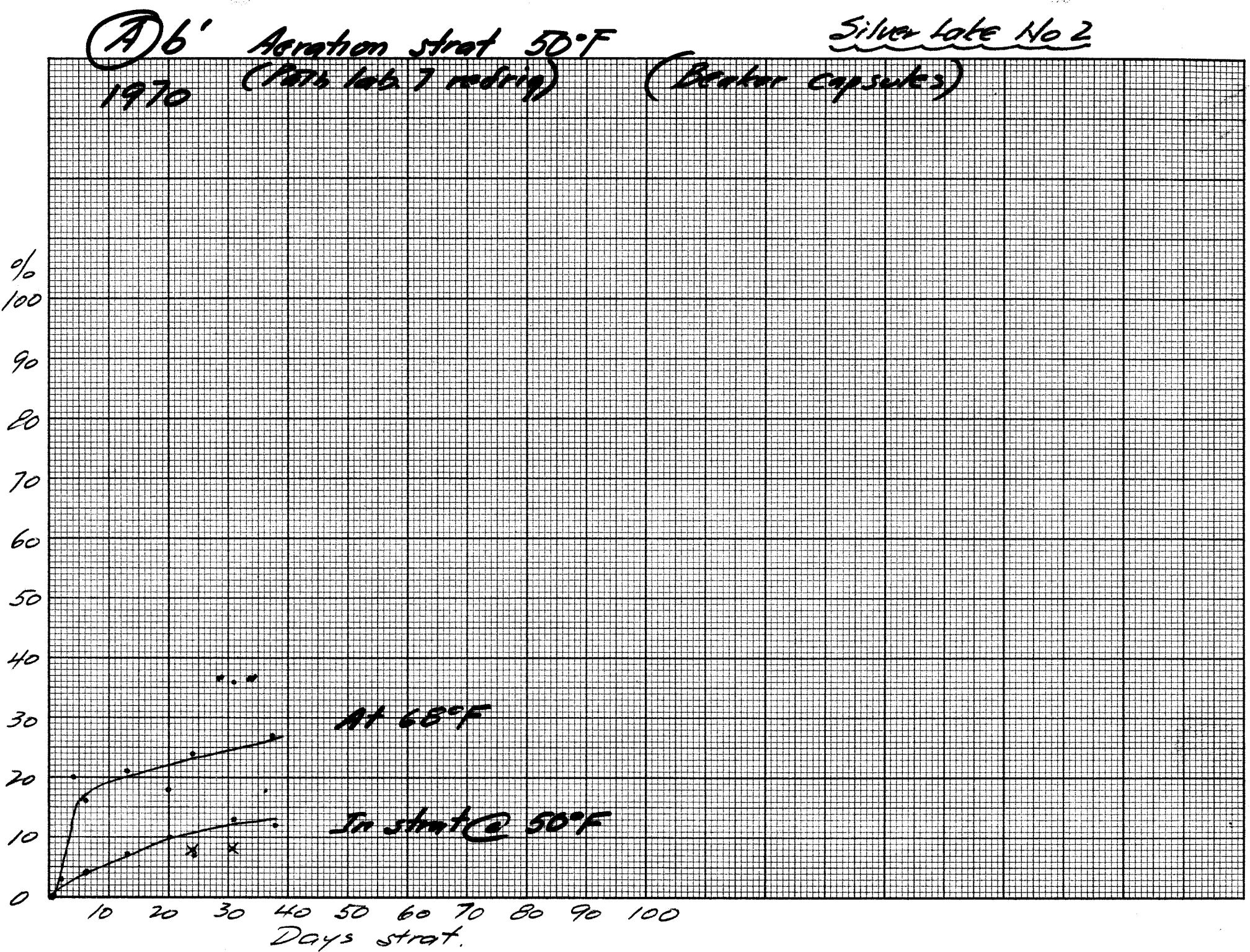
Experiment (A) d' Aeration strat 59°F

Date	Time of day	Germ. time (days)		Tips No.	Tips Cum.	Tips %	Germination No.	Germination Cum.	Germination %	No. of days
		Germination before strat record plus record below								
Aug 17	1PM	Sample (9) 0			(142)	( )				
			Back strat 40°F Oct strat							
Oct 9										
Oct 16			(190)	←	→		52	52		
					(End)					
			Finished							
		Sample ___ 0			( )	( )				
				Seeds dying for lack adequate O_2. "Drowning"						
		Sample ___ 0			( )	( )				

(A) 6' Agrathon strat 50°F

Silver Lake No 2

1970 (Parts lab 7 redrig) (Barber capsules)



Summary

(A) 6' Agration strat 50°F Silver Lake No 2
(Path lab 7 refrig) (Baker capsules)

1970 Test period June 6 – July 21

June 6 9AM Seed into strat @ 50°F

Date	Sample No	Strat No days	Germination % Complete	Germination % Tips	No seeds Total	No seeds Viable	Intermediate germ %
June 8	1	2	3			110	0
10	2	4	20			108	0
12	3	6	16			109	4
19	4	13	21			107	7
26	5	20	18			109	10
30	6	24	24			107	7
July 7	7	31	"36"			104	13
" 14	8	38	27			110	12

Silver #2

Experiment (A) b' Aeration strat 50°F Path Lab

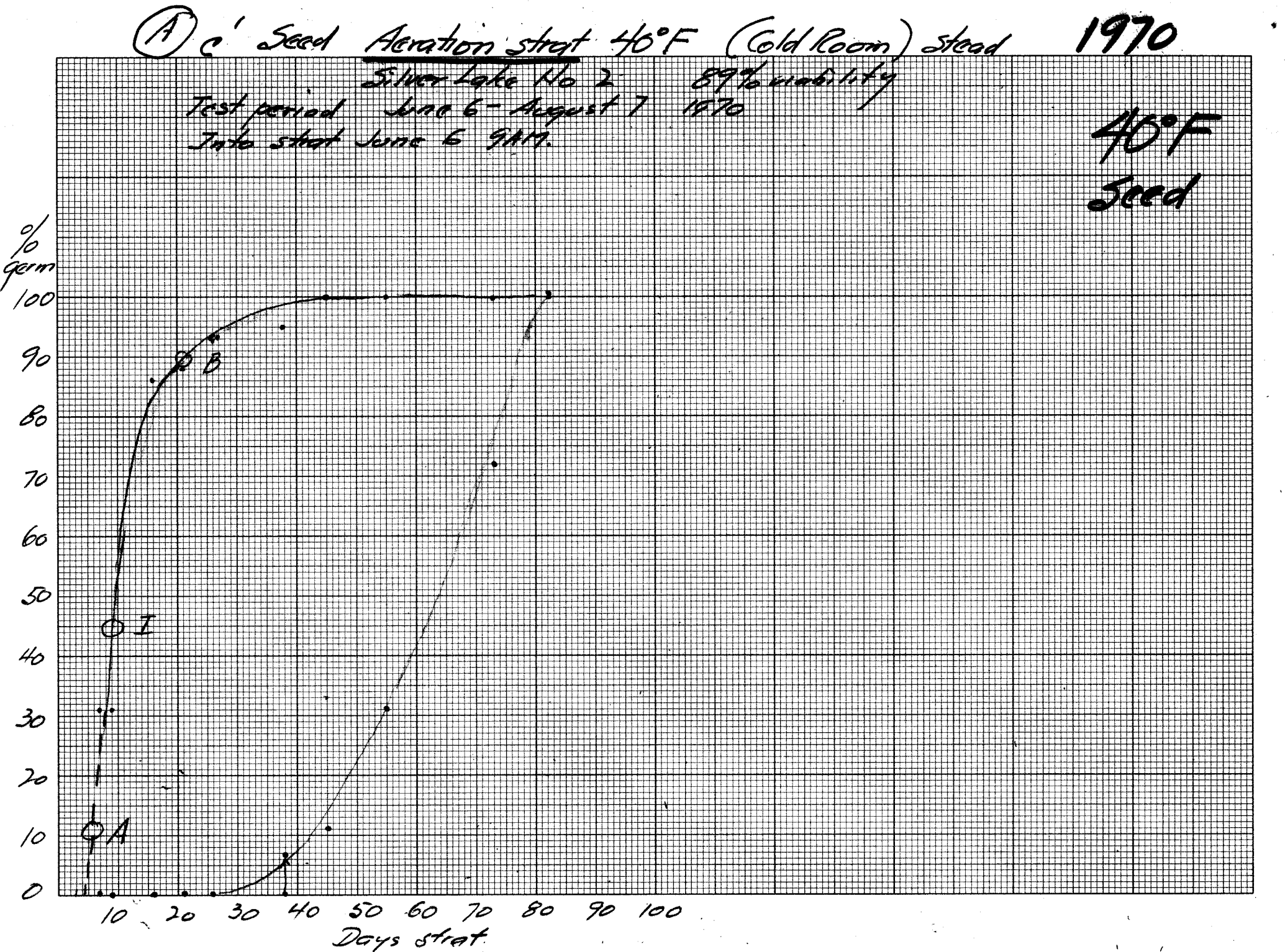
Date		Time of day	Germ. time (days)		Tips No.	Tips Cum.	Tips %		Germination No.	Germination Cum.	Germination %	No. of days
June	6	9:00A	Seeds into plastic capsules, water and 50° aeration stratification.									(0)
			Sample (1)			(124)		(Calc. 110)				
June	8	11:00A	out 0		3	3			0	0	60	(2)
	9	7:30A	1		11	14			0	0	0	
	10	10:30A	2		12	26		1 scp	1	1		
	11	7:30A	3		5	31		1 tip	1	2		
	12	8:00A	4		4	35			0	2		
	15	8:00A	7	(84)	4	39		"	1	3	3%	
								(End)				
			Sample (2)			(121)		(108)				
June	10	10:40A	out 0		24	24			0	0	0	(4)
"	11	7:30A	1		15	39		4 tips 5 scp	9	9		
	12	8:00A	2		8	47		1 scp 9 tips	10	19		
	13	9:00A	3		5	52		4 tips	2	21		
	15	8:00A	5	(36)	7	59		"	1	22		
	16	8:00A	6		4	63			0	22		
	19	8:00A	9	(45)	6	69			0	22	20%	
								(End)				
			Sample (3)			(123)		(109)				
June	12	8:15A	out 0		39	39		5 scp	4	4	4%	(6)
	13	9:00A	1		16	55		1 scp 7 tips	8	12		
	15	8:00A	3	(50)	12	67		4 tips 1 scp	5	17		
	16	8:00A	4		5	72			0	17		
	19	8:00A	7		4	76			0	17	16%	
								(End)				

Experiment (A) 6' Aeration start 50°F

Date		Time of day		Germ. time (days)		Tips No.	Tips Cum.	Tips %	Germination No.	Germination Cum.	Germination %	No. of days
						Formula for arriving at total number: Tips cum + ( ) + Germ sup + B =						(13)
						Example → 89 + (22) + 8 = 119						
			Sample	(4)			(119)	(107 V)		calc.		
June	19	8AM	out	0		59	59		sup 7	7	7%	to 8mm
	20	9AM		1	(22)	30	89		9 tips sup 10	17		
	22	8AM		2		4	93		tips 6	23		to 15mm
	23	8AM		3		0	93		0	23		
	24	9AM		4		2	95		0	23		
	25	8AM		5		0	95		0	23	21%	
									(End)			
									109 calc			
			Sample	(5)			(122)	(113)	exclude			(20)
June	26	7:30A		0	(27) (6 carton)	78	78		11	11	7 to 30mm	
	27	8:30A		1		3	81		tips 5	16	10%	
	29			3	(18)	12	93		TIP 1	17		
✓	30	9:20A		4	(18)	0	93		0	17		
July	1	9:30Am		5	(17)	1	94		tip 3	20		
	2	9:05A		6	(14)	3	97		0	20		
	6	12:00		10		0	97		0	20	18%	
									(END)			
									107 calc			
#5			Sample	(6)			(120)	(106)	exclude			(24)
June	30	10 AM		0	(24)	88	88		8	8	7%	
July	1	9:30 Am		1		7	95		8	16		
	2	9:10AM		2		0	95		TIP 8	24		
	6	12:10		6		0	95		Tip 2	26		
	7	8:40		7		0	95		0	26	24%	
										8 ◊		
									(END)			

Experiment (A) 6' Aeration strat 50°F

Date	Time of day		Germ. time (days)		Tips No.	Tips Cum.	Tips %	Germination No.	Germination Cum.	Germination %	Strat. No. of days
	Sample (1)			(117)	(109)		101 excl				(31)
July 7	8:30 Am	out	0	(22)	82	82		13	13	13-1%	
8	9:00 AM		1	(18)	4	86		TIP 12	25		
9	9:30 Am		2		1	87		tip 12	37		
10	9:30 Am		3		0	87		0	37	36%	
			4				Probs not all normal				
			5								
13			6		0	87		0	37		
14	9:30 AM		7		1	88	calc	0	37		
Last →	Sample (8)			(124)	(110)			(End)			(38)
July 14	9:30A	out	0	(24)	87	87		13	13	12%	
15	8:30A		1		0	87		5	18		
16	9:30A		2		0	87		9	27		
20		6	3				2 tips 1 sup	3	30		
21		7	4		0	87		0	30	27%	
			5		About 20 more germinated but glassy dried						
			6								
			7					(End)			
	Sample (9)			( )	( )						
July 21	9 AM	out	0								
			1								
			2	Finished.							
			3								
			4								
			5								
			6								
			7								
	Sample ___			( )	( )						
		out	0								
			1								
			2								
			3								
			4								
			5								
			6								
			7								


A c' Seed Aeration strat 40°F (Cold Room) stead 1970
Silver Lake No 2
89% viability
Test period June 6 – August 7 1970
Into strat June 6 9 A.M.
40°F Seed
% germ
100
90
80
70
60
50
40
30
20
10
0
B
I
A
10 20 30 40 50 60 70 80 90 100
Days strat

Experiment Summary

Exp. (A) C' Treatment Acraflow strat 40°F (Cold Room)

Seed source, name Silver Lake No 2 seed

Treatment details Test period June 6 - Aug 7 1970

Date			
June 6	9AM	Seeds in jar no capsules	(0)

Germination record

Date	Sample No	Treatment (Strat.) No. of days	No. of seeds Total	No. of seeds Viable Calc	Germination 1/ Tips Percents	Germination 1/ Complete Percents	Germination in treatment Percent
June 15	1	7 & 9		95		31	0
22	2	16		107		86	0
27	3	21		132		98	0
July 2	4	26		124		93	0
14	5	38		90		95	7
21	6	45		140		100	11
31	7	55		104		100	31
Aug 18	8	73		109		100	72
" 27	9	82		93		100	100

1/ In 7 days @ 68°F. Germination complete when root tip through seed coats.

Silver #2

Experiment (A) c' Aeration Strat 40°F Cold Rm

Date	Time of day	Germ. time (days)		Tips No.	Tips Cum.	Tips %		Germination No.	Germination Cum.	Germination %	No. of days
June 6	9:00A	Seeds into jar (no capsules yet) H₂O and 40°F aeration strat									(0)
June 12	8:30A	Orange wire sample into strat. 95									
		Sample (1)			(107)		(91V)	excise			
June 15	8:00A	0	Side 3 2 mm	5	5			0	0	0	(9)
" 16	8:00A	1		25	30			0	0	0	
" 17	17:30P	2		13	43		10 tips 7 sep	17	17		
18	3:30P	3	(51)	6	49		tips	9	26		
19	8:00A	4		9	58		"	1	27		
20	9AM	5		4	62		"	2	29	31	
22	8:30A	7	#	6	68			0	29	32%	
									(End)		
								137			
Orange wire		Sample (1')			(154)		(138V)	excise			
June 19	8AM	0		11	11			0	0	0	(7)
" 20	9AM	1	(57)	86	97			0	0	0	
22	9:30A	3		6	103		36 tips 2 sep	38	38		to 12 mm
23	8:00A	4		3	106		tips	4	42		
24	9:00A	5		4	110			1	43		
25	8:00A	6	(4)	0	110			0	43	31%	
									(End)		
This orange wire sample is a check on 7 day strat 107											
		Sample (2)			(120)		(111V)				(16)
June 22	8:30A	0	(37)	83	83			0	0	0	
23	8:00A	1	(15)	20	103		43 tips 2 sep	45	45		
24	9:00A	2		2	105		tip 44 sep 2	46	91		
25	9:00A	3		0	105		tips	4	95		
26	7:45A	4		0	105			0	95	89	
27	8:30A	5									
29	10:45A	7		0	105			0	95	86%	
									(End)		

18

Silver #2

Experiment (A) c' Agmation 40°F Cold RM (2)

Date		Time of day		Germ. time (days)		Tips No.	Tips Cum.	Tips %		Germination No.	Germination Cum.	Germination %	No. of days
									132c				
	Sample		(3)				(148)		(138)		excise		(21)
June	27	9AM		0	(24)	124	124			0	0	0	
June	29	10:45A		2	(14)	7	131		117 tips 3 sup	120	120		
✓	30	10 AM		3	(13)	1	132		2 tips	2	122		
July	1	9:30AM		4		0	132			0	122		
	2	9:10 A		5	(12)	1	133			0	122		
	6	1:30 P		9		0	133			0	122		
												92 88%	
												61c	
									(END)				27
									124c				
	Sample		(4)				(139)		(122)		excise		(26)
July	2	9:15A		0	(13)	126	126			0	0	0	
July	6	9:15 Am		4		0	126		108 sup 4 sup	112	112		
	7	8:30 AM		5	(9)	3	129		1 T, R 1 sup	2	114		
	8	9:05 AM		6	(7)	2	131			0	114	92 93%	
	9	9:25 A		7		0	131			0	114		
											Use 93		
									(END)				
													39
									90c				
	Sample		(5)				(101)		(87)		excise		(38)
July	14	9:30		0	(11)	84	84			6	6	7%	
	15	9:00A			(10)				71 tips 15 sup	72	78	93	
	16	9:30A				0	84		5 tips	5	83	95	
	17	9:00A								0	83	95%	
									(End)				
											Use 95%		

Silver 2

Experiment (A) c' Aeration 40°F Cold Rm

Date	Time of day	Germ. time (days)	Tips No.	Tips Cum.	Tips %	Germination No.	Germination Cum.	Germination %	No. of days
						140			(46) (45)
		Sample (6)		(157)		(145)	excise		
July 21	9AM	0	(15) 6 tips 9 dup	176	176	16	16	11%	
22	12:45P		17 dup			119 tips 33 dup	172	138	
23	3PM					6	144		
24	8AM					1	145	100%	
			(End)						
		Sample (7)		89%		(104)	31%		(56)
July 31	9AM	0		(117)		34	34		to 18 mm
Aug 3	8AM		Most are tips			70	104	100%	Dec 10"
				Contrast					
				80%					
		Sample (7)' Poor aeration		(118)		(95)			(56)
July 31	9AM	0	Most are tips			1	1		5mm
Aug 3	8AM					90	91		
7	3PM					4	95	100%	
17	11AM								

Silver #2

Experiment (A) C' Aeration 40°F Cold Room

Date	Time of day	Germ. time (days)	No.	Tips Cum.	%	Germination No.	Cum.	%	No. of days
		Sample (8):		(122)		(109)			
Aug 18	10:30	0 (11)	32	32		79	79	72%	to 20 mm live tip
19	8:00A					33	112	100%	
						(End)			
		Sample (9)		(104)		(93)			
Aug 27	8:15A	0				96	96	100%	
						(End)			

To 30 mm Stunted roots, black
no root hairs

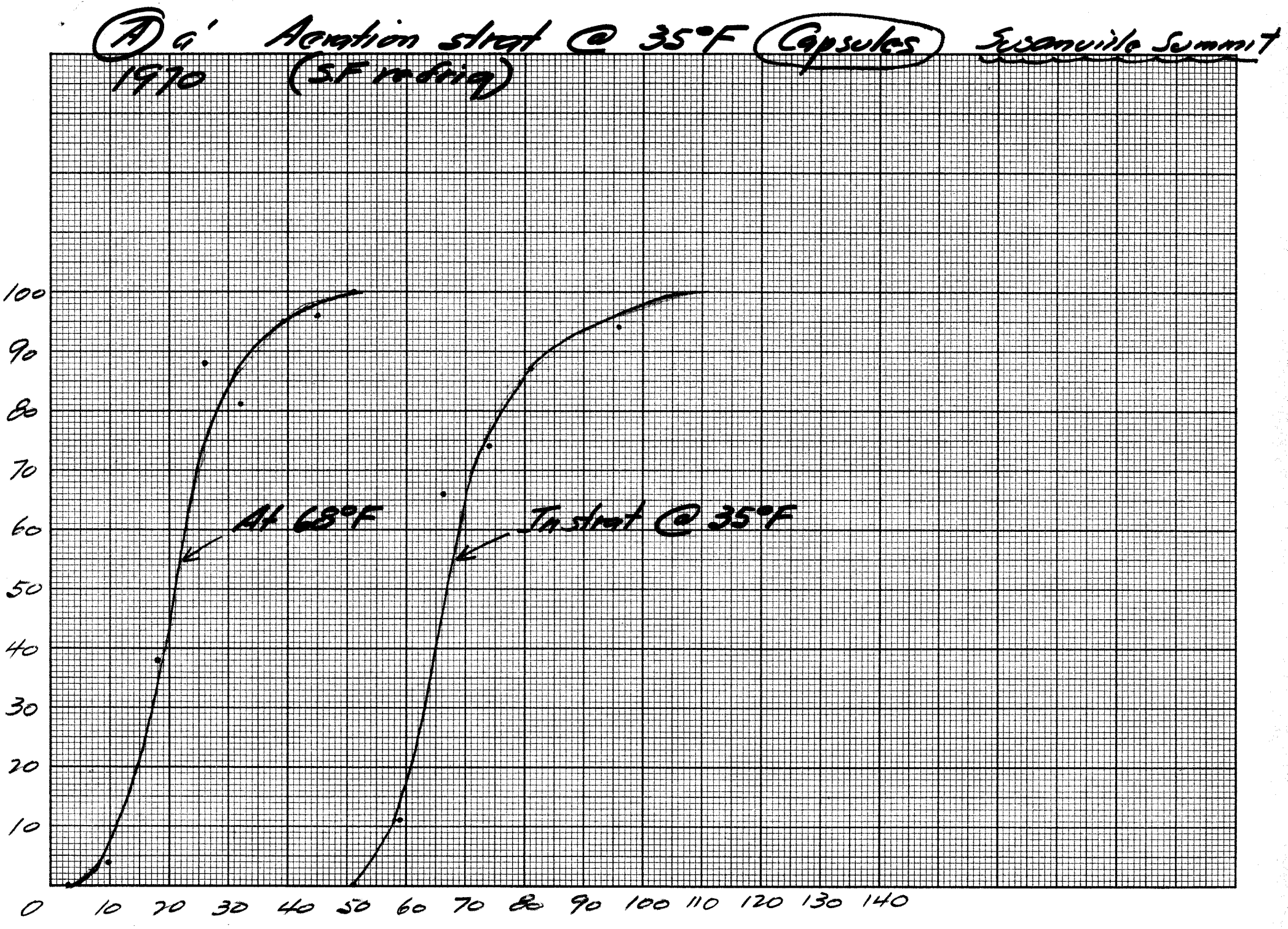
Observe root hair development

Finish

Sept 3 8AM Moderate root hair development. In soil probably normal. Black, cracked roots

Sample ___ 0 ( ) ( )

Stunted roots sprouted new roots


A g' Agration strat @ 35°F Capsules Susanville Summit
1970 (SF mdfiq)
100
90
80
70
60
50
40
30
20
10
At 68°F
In strat @ 35°F
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140

Experiment Summary

Exp (A) a' Treatment Agration strat @ 35°F (Capsules)

Seed source, name Susanville Summit (S.F. collg)

1970

Treatment details Test period Apr 8 – July 12, 1970

Date

Germination record

Date	Sample No	Treatment (Strat.) No. of days	No. of seeds Total	No. of seeds Viable	Germination 1/ Tips Percents	Germination 1/ Complete Percents	Germination in treatment Percent
Apr 11	1	3	62	61	3	0	0
18	2	10	83	82	28	4	
26	3	18	97	96	70	38	
May 4	4	26	59	57	75	88	
10	5	32	99	99	78	81	
17	6	39	79	76	92	95	
23	7	45	82	80	96	96	
29	8	51	37	37	100	100	0
		Instrat.					
June 5		58					11
13		66					66
21		74					74
28		81					87
July 12		96					94
22		106					

1/ In 7 days @ 68°F. Germination complete when root tip through seed coats.

Aeration (Capsule with orange colored wire)

Experiment A 9' H_2O strat @ 35°F 102 Monterey Blvd

Beaker Jesanville Summit Seed 1969 Started Apr 8/70 6AM (0)

Date	Time of day		Germ. time (days)	Tips No.	Tips Cum.	Tips %		Germination No.	Germination Cum.	Germination %	Strat. No. of days
	Sample	(1)		(D 35)	(L 27) (61 V)						
Apr. 11	6 PM	out	0 Light	0	0	0		0	0	0	(3)
			1 Dark	0	0	0		0	0	0	
			2 The 62 seeds (total) separated into 2 groups								
			3 in dish Light (L) = not fully mature and Dark								
			4 (D) Apparently fully mature The light seeds								
			5 are red and the dark deep reddish purple								
			6 Light	0	0	0		0	0	0	
April 18	7:00AM		7 Dark	2	2	3%		0	0	0%	
	Sample	(2)		(83)	(82 V)	obs.				(End)	
Apr. 18	8:00A	out	0	1	1			0	0	0	(10)
" 19	9:00A		1	10	11			0	0	0	
" 26	9:00A		2	12	23	28%	1 tip 2 sdp	3	3		
			3							4%	
			4							(End)	
			5								
			6								
			7								
	Sample	(3)		(97)	(96 V)	obs.					
Apr. 26	9:00A	out	0	11	11			0	0	0	(18)
28	4:45P		1	31	42		3 tips 25	28	28		
29	8:30A		2	2	44		3 tips	31	31		
30	8:30 AM		3	3	47		4 tips	4	35		
1			4	20	67	70%					
2			5								
May 3			6						36	38%	
			7						(End)		
	Sample	(4)		(59)	(57 V)						
May 4	6PM	out	0	21	21			0	0	0	(26)
" 5	6PM		1	18	39		14 tips 11 sdp	25	25		
" 6	6PM		2	2	41		1 tips	20	45		
7	6PM		3	2	43		4 tips	4	49		
8	6PM		4	0	43			0	49		
9			5								
10	9:AM		6	0	43		1 tips	1	50		
11	6AM		7	0	43	75%		0	50	88%	
									(End)		

Sus Sum. (orange wire)

Experiment (A) 'a' H_2O Stat Aeration @ 35°F

1969 Sus. Sommit Started Apr. 8/70 102 Monterey

Date	Time of day		Germ. time (days)	No.	Tips Cum.	%		Germination No.	Cum.	%	Strat. No. of days
	Sample (5)			(99)	(99V)		excise				
May 10	9:00AM	out	0 (35 no tips left)	64	64			0	0	0	32
" 11	6 PM		1 Positive → these	7	71		56 tips 13 sdp	69	69		42 mm Ave 4 mm
" 12	6 AM		2	0	71		tips	6	75		
" 13	6 AM		3	0	71		"	5	80		
13	6 PM		4	0	71			0	80		
14	6 PM		5	4	75			0	80		
15	6 PM		6	2	77	78%		0	80		
17	9AM		7	0	77			0	80	81%	
	Sample (6)			(79)	(76V)		excise	(End)			
May 17	9:30A	out	0 (13 no tips positive)	66	66			0	0	0	39
18	5:30A		1 (9 no tips left)	1	67		65 tips 3 sdp	68	68		
19	4:30P		2 " "	2	69		1 tips	1	69		
19			3	1	70		3 tips	3	72		
20	6:00P		4	0	70			0	72		
25	6:00P		5	0	70	92%		0	72	95%	
			6					(End)			
			7								
	Sample (7)			(82)	(80V)		excise				
May 23	8:45P	out	0	71	71			0	0	0	45
24	9:00A		1 (5 no tips left)	5	76		tips	40	40	max 4mm Ave 2mm	
24	9:00P		2	1	77		tips	32	72		
25	6:30A		3	0	77		tips	3	75		
25	8:30P		4	0	77			1	76		
26	5:00P		5 (5 no tips left.)	0	77			1	77	96%	
30	6:30P		6	0	77	96%		0	77		
			7					(End)			
	Sample (8)			(37)	(37V)						
May 29	8:30P	out	0 (All Seeds)	37	37			0	0	0	51
30	6:30AM		1 (None left)	0	37		tips	8	8	2-6 mm	
"	6:30PM		2	0	37	100%	tips	29	37	100%	
			3								
			4					(End)			

Instant from now on
Make record on 5 June next.

Since 6:30 AM

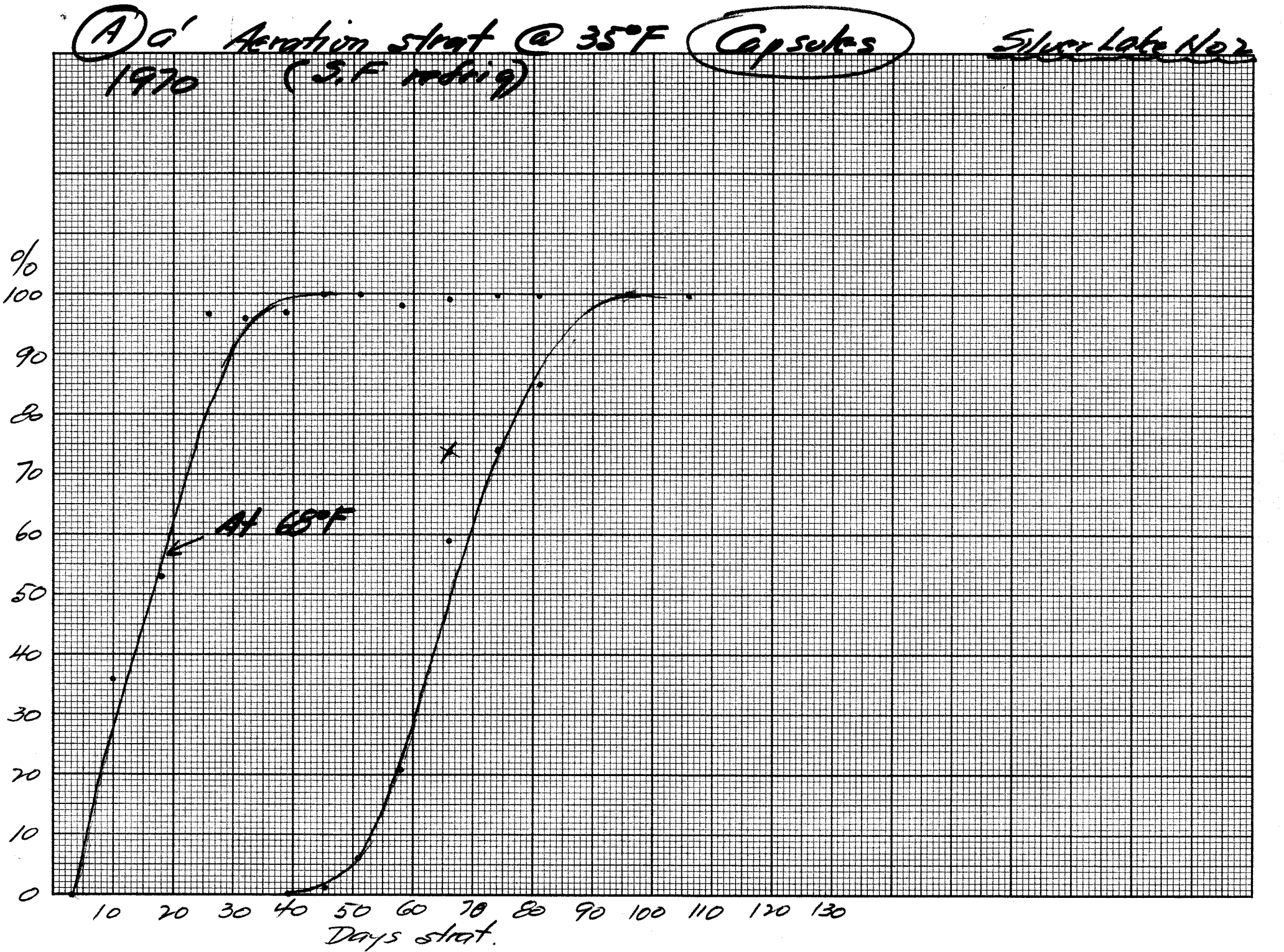
In strat only now

18 19

Sus Sem (orange wire) 26 61

Experiment (4) G' H₂O Acetron 35°F (3)

Date	Time of day		Germ time (days)		No.	Tips Cum.	%	Germination No.	Cum.	%	Strat. No. of days
In strat only	Sample	10		(95)		(93 V)					
June 5	5:30P	out	0	(8)	77	77		10	10	11%	56
" 13	9:00P		1		-	-		51	61	66	to 6m in
" 21	9:00A		2	(7)	1	78		8	69	74	74
" 28	8:00A		3	(7)	0	78		12	81	87	81
July 12	11:45A		4					6	87	94	96
" 22	6:00P		5								106
			6								
			7								
	Sample	—		( )		( )					
		out	0								
			1								
			2								
			3								
			4								
			5								
			6								
			7								
Humidity	Sample	(4)		( )		( )					(64)
June 28	10 AM	out	0	Ant wetted, Some mold. Appreciable							
"	1 PM	3 hrs	1	Prob. growth	3	3		0	0	0	
"	430 PM	6½ hrs	2		16	19		0	0	0	
"	10 PM	12 hrs	3	1 day	6	25		0	0	0	
29	6 AM		4		—	75		0	0	0	
			5								
			6								
			7								
Humidity	Sample	(5)		(194)		(175 V)					
July 12	12:30P	out	0	Several tips showing				0	0	0	
13	6:00A		1					3	3	0	
14	6:00A		2					12	15		left in dish
14	8 PM		3					18	35		" "
15	9 PM		4					36	71		
22	6 PM		5					37	108		
		194	6					End			
		1746	7								


A) a' Aeration strat @ 35°F
1970
(3.F refrig)
Capsules
Silver Lake No 2
%
100
90
80
70
60
50
40
30
20
10
0
At 65°F
10 20 30 40 50 60 70 80 90 100 110 120 130
Days strat.

Experiment Summary

Exp A a' Treatment Aeration strat @ 35°F (SF redrig) Capsules

Seed source, name Silver Lake No 2

1970

Treatment details Test period Apr. 8 - July 22, 1970

Date

Germination record

Date	Sample No	Treatment (strat) No. of days	No. of seeds G/C. Total	Viable	Germination 1/ Tips Percents	Complete Percents	Germination in treatment Percent
April 11	1	3	93		12	0	0
18	2	10	119		52	36	
26	3	18	101		66	53	
May 4	4	26	122		100	97	
10	5	32	103		98	96	
17	6	39	112		98	97	0
23	7	45	105		100	100	1
29	8	51	105		95	100	6
June 5	9	58	113			98	21
13	10	66	101			99	59
21	11	74	110			100	74
28	12	81	117			100	85
July 12	13	96	115				100
22	14	106	111				100

1/ In 7 days @ 68°F. Germination complete when root tip through seed coats.

Aeration (Unmarked capsules)

Experiment: Ac'H₂O Strat. @ 35°F 108 Monterey Blvd

Broker: Silver Lake No 2 1967 Seed Started Apr. 8 1970 6:30 AM (0)

Date	Time of day		Germ. time (days)	Tips No.	Tips Cum.	%Germ	Germination No.	Germination Cum.	Germination %	Strat. No. of days
	Sample	(1)		(105)	(93)					
Apr. 11		out	0	1	1	0	0	0	0	(3)
18	7:00 AM		1	10	11		0	0	0%	
			2			12%			(End)	
			3							
			4							
			5							
			6							
			7							
	Sample	(2)		(134)	(119)					
Apr. 18	8:00A	out	0	1	1		0	0	0	(10)
" 19	9:00A		1	17	18		0	0	0	
" 26	9:00A		2	44	62	52%	10 tips 33 sep	43	43	
			3							
			4						(End)	36%
			5							
			6							
			7							
	Sample	(3)		(114)	(101)					
Apr. 26	9:00A	out	0	21	21		0	0	0	(18)
28	4:45P	Y	2	35	56		12 tips 25 sep	37	37	
29	8:30A	3	3	5	61		7 tips	7	44	
30	8:30 PM	4	3	1	62		9 tips	9	53	
1		5	4	4	66		0	0	53	
2		6	5		23	66%				53%
3		7	6							
4			7	9	75		1	54		
	Sample	(4)		(137)	(122 V)			(End)		
May 4	6 PM	out	0	100	100		0	0	0	(26)
5	6 PM		1	24	124		50 tips 7	57	57	
6	6 PM		2	0	124		54 tips 1 sep	55	107	
7	6 PM		3	3	127		4 tips	10	117	
8	6 PM		4	1	128		1 tips	1	118	
9			5							
10	9:00 AM		6	0	128	100%		0	118	
11	6:00 PM		7	0	128			0	118	97%
								(End)		

(3)

Silver Lake #2 Unmarked capsules

Experiment (A) a' H_2O Start. Aeration @ 35°F 108

Silver Lake #2 seed — Monterey, start Apr 6 ho

Date	Time of day		Germ. time (days)	Tips No.	Tips Cum.	Tips %		Germination No.	Germination Cum.	Germination %	Strat. No. of days
	Sample	(5)		(116)	(103 V)		excise				
May 10	9 AM	out	0	22 no tips left	94	94		0	0	0	(3 V)
" 11	6 PM		1	5	99		84 tips 7 sdp	91	91		2-Light Ave 5mm
" 12	6 AM		2	2	101		tips	3	94		
" 13	6 AM		3	0	101		"	4	98		
" 13	6 PM		4	0	101			0	98		
" 14	6 PM		5	0	101			1	99		
" 15	6 PM		6	0	101			0	99		
" 17	9 AM		7	0	101	98%		0	99	96%	
	Sample	(6)		(176)	(112 V)		excise	(End)			
May 17	9:30 A	out	0	100	100			0	0	0	(39)
18	5:30 A		1	15 No tips left	109		62 tips 2 sdp	64	64		
18	4:30 P		2 3 4 5 6	14 "	110		30 tips	30	94		
19		2		0	110		17 tip 1 sdp	13	107		
20	6 PM			0	110		17 tip 1 sdp	2	109	~~98~~ 97%	
					98%			(End)		97%	
			7								
	Sample	(7)		(118)	(105 V)		excise			1%	
May 23	8:30 P	out	0	102	102			1	1	Last ind's 1 left =	(45)
24	9:00 A		1	6	108		tips	54	54	AVG = 10mm	
24	9 PM		2	2	110		tips	44	98	AVG = 4mm	
			3 4	Germination, growth much faster, greater than in Petri							
25	6:30 A	2	5	2	112			5	103		
25	8:30 P		6	0	112			2	105	100%	
26	5:00 P		7	0	112	100%		2	107	Last ind's to sec	
	Sample	(8)		(117)	(105 V)		excise			~~99%~~ 97%	(51)
May 29	8:30 P	out	0	98	98			6	6	6%	
30	6:30 AM	1	1	2	100		tips	44	50		
30	6:30 PM		2	0	100		"	50	100		
31	6:30 AM	2	3	0	100		"	3	103		
31	6:30 PM		4	0	100		"	2	105		
June 1	8:30 PM		5	0	100			0	105	✓	
2	8:30 PM		6	0	100	95%		0	105	100%	
			7					(End)			

114

25

Unmarked Capsules Silver #2

Experiment (A) 0° Strat 35°F Acadian (2) Montauk

Date	Time of day		Germ. time (days)	Tips No.	Tips Cum.	Tips %		Germination No.	Germination Cum.	Germination %	Strat. No. of days
	Sample (9)			(127)	(113 V)		excise				
June 5	5:30P	out	0	7 gave 120 tips 87	87			24	24	21%	(58)
6	6:30A		1	0	87		50 tips	50	74		Ave 4mm
6	6:30P		2	3	90		29 tips	29	103		
7	6:30A	2	3	0	90		"	8	111		
7	6:30P		4	0	90			0	111		
13	9:00P		5	0	90			0	111	98%	
			6					(End)			
			7								
	Sample (10)			(114)	(101)		excise				
June 13	9PM	out	0	(14) 41	41			59	59	59%	(66)
14	8:30AM		1	0	41		28 tips	28	87		
14	8:30PM		2	(14) 0	41			13	100	100%	
			3					(End)		99%	
			4								
			5								
			6								
			7								
	Sample (11)			(124)	(110 V)		excise			74%	(74)
June 21	9:30A	out	0	5 no tips N coating coat 44	44			64	64	to 12 mm	
" 21	3:30P	1	1	0	44			18	82	Ave 7mm	
" 21	9:30P		2	0	44			20	102	Ave 2.5mm	
" 22	6:00A		3	1	45			5	107		
22	7:00P		4	0	45			3	110		
23	7:00A		5	0	45			1	111	100% ✓	
			6								
			7					(End)		85%	
	Sample (12)			(132)	(117 V)					to 14mm	
June 28	8:00A	out	0	7 rotten 700 tips 18	18			100	100		(81)
		Hrs	1								
" "	10:00A	2	2					3	103		
" "	1PM	5	3					6	109		
" "	4:30PM	8½	4	2 kdt				7	116		
" "	6:30PM	10½	5	1 "				1	117		
" "	10PM	14	6					0	117		✓
" "	11:30P	15½	7					1	118	100%	
								(End)			

These all decayed or non viable

115 109

Unmarked capsules

Experiment (A) 1' strat 35°F Aeration Monterey Bl.

Date	Time of day	Germ. time (days)	No.	Tips Cum.	Tips %	Germination No.	Germination Cum.	Germination %	No. of days
		Sample (13)		(129)		(115 / 121)	excise		
July 12	11:45A	0 out (5)	9	9		115	115	100%	to 18mm
13	6:00A					6	121		Aug 10 " "
							(End)	100%	
		Sample (14)		(125)		(111 / 114)		100%	
July 22	6PM	0 out				114	114	100%	
							End		
		Sample ___		( )		( )			
		0							

Lab. table germination 70-73°F

A, Ic (A) Steat for 1 hour @ 104°F (40°C)

Date		①	②	③	④	⑤
		← Seed →			← Embryos →	
1970		Wet (Soaked)	Steat (Tips)	Germinated 3-10 mm	Excised	Germinated
		(20)	(20)	(20)	(10)	
Jan 19	1 to 4 PM	treatment	104°F	Germ at	8:50 AM	Out 9:50 AM (1hr)
" 19	4 PM	Excised	No growth Germ. Cup	3-12 mm Looks normal	No growth Some gray cotyledons	13-23 mm Looks normal
" 20	9:00 A	No growth	8	8-15 mm All growing Look normal	1-5 mm All growing Look normal	20-30 mm All growing Normal (End)
" 21	7:30 A	All growing 3-7 mm	16 3-10 mm	20 15-25 mm	10 5-10 mm	
" 22	8:30 A	All growing 6-15 mm but not normal Brown cracky root tips	16 7-16 mm Not normal Brown root 4 did not grow, Re mained tips	All growing Not fully normal Some Brown root (End) but 100%	All growing Just about normal No Brown root Root tips white Dense root hairs	
" 23	11:30 A	All growing Abnormal Brown root Root tips under cap, meristem, brown 104°F stands producing Abnormal Gerth Incipient (End) 100% but	17 grow 3 tips Abnormal about as in ① (End) 85% but		(End) Jan 24 8:45 Normal Healthy Tab	

A, k (B) Strat for 4 hours @ 104°F (40°C)

Date		① ← Seed →	②	③	④ ← Embryos →	⑤
1970		Wet	Strat tips	Germinated	Excised	Germinated (9)
		(20)	(20)	3-9 mm	(12)	6-18 mm
Jan 19	Into	104° @	10:27 AM	Out 2:27 PM	(4 hrs)	
Jan 19	4PM	Excised	No growth Tips normal	3-11 mm Look normal	No growth Look ok	7-22 mm Look ok
			Germination No. Cum	Growth	No. Cum	9
Jan 20	9AM	No growth	4	8-15 mm Proportional length of hypo & root 60 Looks abnormal root growth retarded	5 curv	7-24 mm growth seems to be slowed.
Jan 21	8:45 AM	20 3-8 mm	6 5-15 mm	All growing Describe normality tomorrow	12 3-10 mm	9 7-35 mm
Jan 22	8:45A	20 6-16 mm 6= 6-10 mm Abnormal Light Brown root	6 10-21 mm Light Brown root 14 remained tips. No gnto Abnormal 30% but	All growing Nearly normal B 100% (End)	All growing Normal Roots white Dense root hairs 100% (End)	All Growing Normal Roots 25 mm Hypos 20°! 100% (End)
Jan 23	11:30A	Abnormal Roots tips Effected Knobby →	6 grew fairly normally 14 that did not grow excised		Tab.	
Jan 24 & 25, 26	8:45A		Excised are all Growing but somewhat Abnormal (End)			

In Petri

AK(C) Strat 24 hours @ 104°F (2)

Date	Time of day	(1) ← Seed →		(2) Seed	(3) Tab →		← (4) Embryos →		(5) Embryos →	
1970		Wet (24)		Strat (tips) (20)	Germ (25)	3-7mm	Excised (12)		Germinated (10)	5-17mm
Jan 19	10:27A	Seeds & embryos into 104°F. germination on lab. table					Out at 11:27A for			
Jan 20	10:40A	Excised embryos Normal		No growth	7-16mm About normal		No growth Embryos Normal		Growth 10-20mm	
Jan 21	8:00A	No growth		No growth	(25) 6-17mm Abnormal Brown root. Curl.		(12) 3-5mm Normal		(9) 15-25mm 1 dead (seed non viable) Slightly Abnormal	
Jan 22	9:AM	(24) 1-10mm Definitely abnormal		No growth 10 seeds excised for viability 10 not excised	(25) Abnormal Brown root. Curl. (End)		(12) Normal Jan 25th Yes (End)		(9) Slightly Abnormal (End)	
Jan 23	12 noon	(24) 3-15mm But abnormal Root tips extracted		10 excised 4-9mm Normal → 10 not excised → No growth Last germ capacity but remain viable			Tab.			
Jan 24 & 25	9:00 AM	" "		Excised 5 normal grth 5 root meristem injured Not excised No growth (End)						

A, k, Strat @ 113°F (45°C)

1970 Date			Silver Lake 1967 Wet seed	Sus Sum strat seed	Sus Sum Germ seed	Silver Lake 1967 Embryos	Silver L. '67 Sus Sum Seedlings
			20 / 20V	50 / 50V	50 / 50V	36 / 36V	20 / 20V
			→ Embryos	1 hour exposure @			
March 31			Into 113°F	1:40 P Out 2:40 P			
April 1		9:00 AM	Excised (part) on red spot	Most growing	Most growing	No growth	Look ok
April 2		8:00 AM	No growth	50 normal	50 normal	90% ± 5mm growing	20 growing normally
				End	End		
April 6		8:00 AM	6 stunted, 3 some growth, 1 normal	but brown	stunted roots	29 normal, about 1 slight root tip injury, 4 stunted	20 perfectly normal
	Left in dish		(End) 5%	100%	100%	End 81%	End 100%
Embryos →			24 / 23V				
			Wet seed	This is the 2nd half of the wet seed, No germination in 6 days so excised. Compare with a) above			
April 2		8:00 AM	0				
" 6		8:00 AM	0				
8		11:40	11 normal, 13 stunted all grow 1-4 mm Abnormal will die				
				— 35%			
Embryos →			End 50%				
			Embryos	16 hrs exposure			
			29 / 29V	57 / 57V	49 / 49V	53 / 53V	36 / 36V
March 31			Into	3:00 PM		cum	
April 1		Out 7:00 AM	Excised half on red spot	Slight or no growth, Left in dish	Slight no growth, growing, some abnormal	No growth	Look ok
" 2		8:00 AM	No growth	9 removed	removed	30% ± 5mm growing	All healthy
" 6		8:00 AM	Abnormal grth	5 normal ←	15 normal ← removed	24 normal ← removed	36 normal perfectly
" 8		12:10 P	16 abnormal root tip injury, 13 stunted decayed	32 normal, 6 abnormal, 19 no germination	41 " slight abnorm. 8 root tip injury	49 slight root tip injury, 4 stunted	End 100%
		End			End	End	
Embryos		0%	50	End 56%	80-90%	92%	
			Wet seed				
April 2		8:00 A	0				
" 6		8:00 A	0			Tab	
" 8		12:10 P	0				
			No strat effect @ 104°F. Root tip injury embryos				

A, k_3 Strat @ 122°F (50°C)

Date	Silver Lake No 2 Wet seed	Sus Sem Strat seed (tips)	Sus Sem Germinated seed 3-7mm	Silver Lake No 2 Embryos
		1 hour exposure		
Mar 28	Into 122°F	9:30A Out 10:30A		
" 29 11:30A	Excised (All) (32) (29V)	No growth (39) (39V)	No growth (20) (20V)	No growth (20) (20V)
" "				
" 30 11:00A	On red spot No growth	No growth	No appreciable growth	Some growing
" 31 12:00 noon	A few curving	1 1 Left in dish	Some growth	Most " "
Apr 1 10:00A	About half growing	1 2 " "	" " but abnorm	" " "
" 2 8:30A	" " "	3 5 " "	Only 1 normal	6 normal
" 3 9:00A	Most growing but abnormal	0 5 " "	None normal	7 normal, 35% The remainder root tips injured
" 6 8:00A	10 normal, (border) 12 growth but abnor. 7 no growth decayed	6 normal (badger) 11 growth color abnor 11 " no color 1-10mm 11 no germ Excised 6 of these 6 normal 12 total normal	Border lethal to Lethal	
8 IPM	(End) 34% but border. Root injury likely on all.	(End) 31%	(End) 0%	(End) 35%
		2 hour exposure		
	(33) (33V)	(21) (21V)	(20) (20V)	(20) (20V)
Mar 28	Into 122°F	9:30A Out 11:30A	3-7mm	
Mar 29 11:30A	Excised on red spot	No growth	No growth	No growth
Mar 30	No growth	" "	" "	Some curving
Mar 31	" "	" " green	" "	Most curving
Apr 1 10:00	7 curving	" " fungus	Slight growth abnormal	" " abnormal
" 2 8:30	Prob none will survive	Look dead	Prob all will die	2 or 3 may grow normally
" 6	7 abnor grth	No growth Excised today	4 abnor grth will die color	10 normal
" 8 IPM	2 possibly survive 8 color 1-3mm dead 18 no grth dead	5 normal start in dish 16 stunted seg about dead	16 no grth no color	10 abnormal
	(End) 6% but border as above	(End) 24%	(End) 0% Lethal	(End) 50% All some root tip injury, border

Tab

45°C

Exp A(1), (B) Strat @ 113°F 4hours

	(1) ✓ Wet Seed	(2) ✓ Strat seed (tips)	(3) ✓ Germinated seed	(4) ✓ Excised embryos
Date	(30)	(24)	(20)	(22)
Jan 23 → Seeds into 113°F 8:30A. Oct 12:30A 4hrs treatment				
	Jan 23 2PM / 24th 9:AM / 25th 9:AM / 27th	Jan 23 2PM / 24th & 25 9AM / & 26th / & 27th	Jan 23 2PM / Jan 24 9:00AM / 25th / & 26th & 27 / No germ Before treat. length	Jan 23 2PM / Jan 24 9:00AM / 25th
Seed or embryo No	Seed excised			
1			9.0 mm	9.0
2			10.0	12.0
3			6.0	7.0
4			6.0	7.0
5			4.0	6.0
6			2.0	3.0
7			2.0	2.0
8			6.0	9.0
9			6.0	8.0
10			5.0	7.0
11			5.0	5.0
12			4.0	5.0
13			6.0	8.0
14			6.0	9.0
15			3.0	3.0
16			2.0	3.0
17			3.0	6.0
18			8.0	9.0
19			3.0	6.0
20			4.0	7.0
21				
22				
23				
24	9%	Lethal	Abnormal	Normal healthy
25			0%	100%
26				
27	End	(End)	End	(End)
28				
29	Border level			Tab
30				

No growth

No growth

Excised & used for germination test. Only 1 of the excised embryos germinated

Germinated in 1 day

Germinated 1st day

Germinated 1st day

Germinated 1st

50°C

Exp A, m (A) Strat @ 122°F 1 hour

1970 Date	(1) Wet seed	(2) Strat seed (tips)	(3) Germinated seed	(4) Excised embryos
	38	25	25 2-9 mm	21
Jan 24	Seeds into 122°F	7:20 AM	Out 8:20 AM	
" "	Excised 10:30 AM			
	Jan 25 8 AM	Jan 25 8:00 A	Jan 25 8:00 A	Jan 25 8:00 A
	1/8 germ	No germ	No germ	No germ
	Slight root curving 3 mm	" "	Slight germ 3 mm	Germ 4 mm
	Germ 8 mm, root 12 mm But dead, Slight seg. roots	Seeds excised All with germ 3 mm Radicle 4 mm Plumule not expanded Either Seg roots or plumule	Seeds excised Plumules 1/2 Cot leaves Tip of root	Germ 4 mm Plumule 1/2 Cot leaves Tip of root
	(End)	Lethal		
	Jan 26 9 AM	Jan 26 9 AM	Jan 26 9 AM	Jan 26 9 AM
	Jan 29 9 AM	Jan 29 9 AM	Jan 30 9 AM	Jan 27 9 AM
		" 30 9 AM		
		" 31 9 AM		
	Border 21% lethal	(End)	(End) Lethal	(End)

Tab 81% Normal

Four @ hour / Plates 100 Embryos each Treated

Germinated seed Excised Plate not Ready

Excised embryos / Hour

These germinated seeds Excised 1 hour

Exp A, m (B) Start @ 122°F 4 hours

1970 Date	(1) Wet seed	(2) Start seed (tips)	(3) Germinated seed	(4) Excised embryos
	31	20	25 (2-9 mm)	26
Jan 24	Seeds into 122°F 7:20 AM		Out 11:20 AM	
" 24	Excised 11:30			
	Jan 25 8:00 A / Jan 26 9 AM	Jan 25 8:00 A / Jan 26 9 AM	Jan 25 8:00 A / Jan 26 9:00 A	Jan 25 8:00 A / Jan 26 9:00 AM
	Seeds very dry, all with die coat, No growth, Pod 0.5 cm, Jan 28 All dead	No growth	No growth, Pod 0.5 cm, Jan 29 All dead	No growth, Pod 0.5 cm, 4 cotyl., Jan 30 All dead
	Lethal (End)	Jan 28 No growth, seed excised, Jan 30 Partially, all dead to curve but dead. Lethal (End)	Lethal (End)	Lethal (End)

Tab

$A_1 k_4$ Strat @ 131°F (55°C)

Date	Silver Lake #2 Wet seed	Sus Sum Strat seed (tips)	Sus Sum Germ seed 3-6 mm	Silver Lake #2 Embryos
		1 hour exposures		
Mar 27	Into 131°F (15) (13V)	12:43P Out 1:43P (15) (15V)	(15) (15V)	(15) (15V)
Mar 29 11:30A	Excised on red spot	No growth	No growth	No growth
" 30 11:00A	No growth	" "	" "	Some curving
" 31 12:15P	" "	" "	" "	Most curving but will die
Apr 1 10:00A	Curving, But prob all will die	" " green mould. 8 excised	Appear dead	Stunted roots. All will die
Apr 2 8:30	All dead Curving only signs of growth	All dead; The 8 excised and the 7 intact	All dead ←	9 developed red cots, 11 curved and grew slightly But all roots stunted, glassy constricted. All dead
	Lethal (End)	Lethal (End)	Lethal (End)	Lethal (End)
	2 hours exposure			
Mar 27	Into 131°F (16) ( )	12:43P Out 2:43P (15) (15V)	(15) (15V) 2-5 mm	(15) (15V)
Mar 29 11:30A	No growth	No growth	No growth	No growth
" 30 11:00A	Excised on red spot	" "	" "	" "
" 31 12:15P	No growth	" "	" "	" "
Apr 1 10:00A	" "	" "	" "	" "
Apr 2 8:30 ←	Lethal.	No signs of growth, All dead at any time →		
		(End)		
			Tab	Tab

A, k 2 Strat @ 113°F (45°C)

Date			Sus Sum Strat seed (tips)	Sus Sum germ seed	Seedlings
1970			1 hour exposure		
			37 37V	32 32V	22 22V
Mar 30	2:05P		← Into	113°F Out 3:05P	→
" 31	12 noon		Most growing	Most growing	Most alive
April 1,	9:30A		21 normal	Most growing pab ok	Look ok
" 2	8:30A		30 " "	15 normal	14 normal
6	8:00A		30 normal	20 normal remnant	22 normal but
			4 Stunted grth. rad tips injured	23 normal	some branchial roots
			3 did not germ	4 abnormal	
			End 81%	5 grew but decayed	End 100%
				End 72%	but very very slight injury
April 6	8:00AM		0%	0%	
" "	8:00AM	These latter	Lethal	Lethal	Lethal
" 8		existed	All dead	All dead	0%
			18 hour exposure		
			18 15V	50 50V	21 21V
Mar 30	2:05P		← Into	113°F	
Mar 31	7:00 AM	out 113°F	No growth	No growth	Roots bleeding
April 1	10:00 AM		No growth	Injured is not killed	Look dead
" 2	8:00 AM		" " curving	Most injured	" "
" 3	8:00 AM		" " Stunted some color seg mentation ~5 mm	All about dead	All about dead will die
			Lethal	Lethal	Lethal (End)

Exp A, L (A) (3) Start @ 1130F 1hour 45°C ✓

Dish No 3 Germinated Seed (20)

Date	Time		
Jan 23	7:30A	Into cabinet @ 1130F	
" "	8:30A	Out " " "	

Germination (growth)

Seed No	Jan 23 8:30 AM Before 2 of 5	Jan 24, 9 AM	Jan 25, 8 AM	Jan	AM
1	5.0	8.0			
2	2.0	5.0			
3	3.0	6.0			
4	3.0	6.0			
5	2.5	7.0			
6	6.0	9.0			
7	3.5	9.0			
8	3.0	8.0			
9	4.0	9.0			
10	3.0	7.0			
11	5.0	8.0			
12	5.0	6.0			
13	3.0	8.0			
14	6.0	11.0			
15	5.0	11.0		Tab.	
16	5.0	11.0			
17	5.0	11.0			
18	3.0	7.0			
19	5.0	8.0			
20	4.5	9.0			

Hypos long. Coats stained 70

Coils long 30

Continuing to grow. Coats stained. Seed not as green as Jan 24 AM. Abnormal part of seed.

(End)

Exp A, C (A2) Strat @ 113°F 1 hour

Dish No 2 — Artificial Seed (25)

Date: Jan 23 — Time: 7:30A — Into cabinet @ 113°F
" 23 — 8:30A — Out " " " . No growth

Germination (or growth)

Seed No	Jan 24 9:00AM	Jan 25 8:00AM	Jan 26 9:00AM	Jan 27 8:00AM	Jan 28
1	0	0	0		
2	0	0	0		
3	0	3.0	8.0	10.0	
4	0	0	0		
5	0	0	0		
6	0	0	0		
7	0	0	0		
8	0	0	0	4.0	
9	Curve	4.0	7.0	10.0	
10	0	0	0		
11	0	7.0	12.0	14.0	
12	0	0	0		
13	0	0	0		
14	0	0	0		
15	0	0	0		
16	0	0	0		
17	0	0	0		
18	0	0	0		
19	0	0	0		
20	0	0	0		
21	0	0	0		
22	0	0	0		
23	0	0	0		
24	0	0	0		
25	0	3.0	7.0	8.0	

Abnormal growth

Abnormal growth. Brown root

The 5 seeds that grew abnormal, Brown crust roots. Will die. The ungerminated were excised

Immediately because of root tip injury

Jan 29 The excised grew but abnormally. Will die

Result → 1 hour @ 113°F is not that to short seeds (tips)

(End)

Jan 29 No yet

Silver #2 +

(A) Temp on germination stratified seed and embryos {48hr exposure}

Date	95°F 35°C (1)		104°F 40°C (2)		177°F 50°C (3)	
	Embryos ←	Seed	Embryos	Seed	Embryos	Seed →
	Number into temp					
1970						
Dec 29 7:10A			34	33		
7:25A					35	35
7:45A	50	33				

48hrs

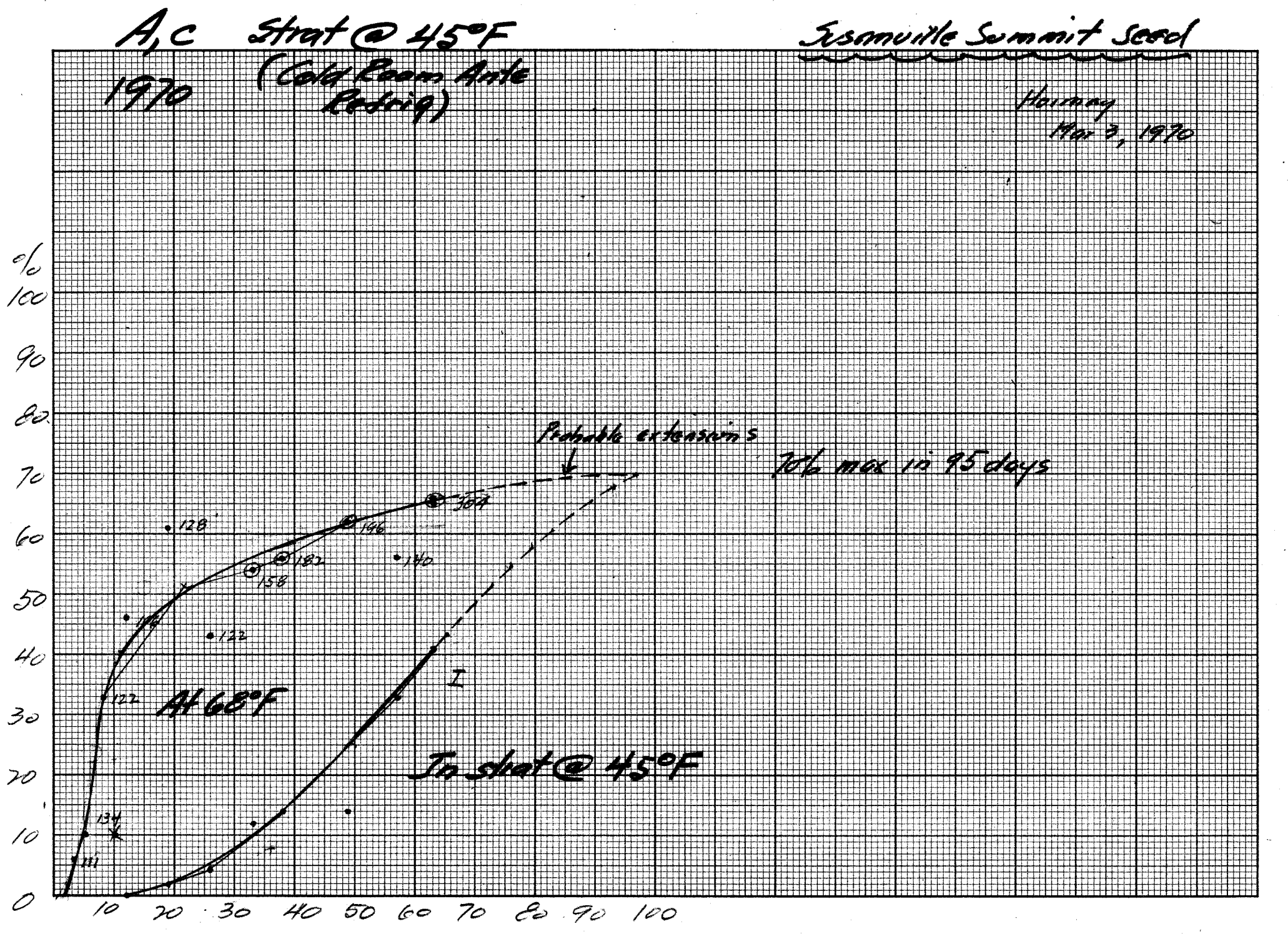
Out temp & germination (48hrs)

	60%	12%	%	6%			0%	
Dec 31 7:10A	→ 30	normal (4)	12	2	0	All appear dead	0	← Normal growth
	(20)	stunted 6	18	—				← stunted or 1 to 2 mm
	—	No growth (23)	70 34	31				← No growth

Recovery of stunted incipient or no growth @ 68°F

Dec 31 7:10A	← 60%	47%	All into	68°F	18%	0%	0% → ← Normal growth
	30 + 3	(11) (3)	15	44% 6			
Jan 3	17	9	14	1		All dead	← stunted
	—	10	5	26			← No growth
	Σ 50	Σ 33	Σ 34	Σ 33			

← End →


A, C Strat @ 45°F
(Cold Room Arte Redrig)
1970
Esmeralda Summit Seed
Harmony
Mar 3, 1970
%
100
90
80
70
60
50
40
30
20
10
0
Probable extensions
70% max in 95 days
128
146
158
182
140
122
122
134
111
At 68°F
I
To Strat @ 45°F
10
20
30
40
50
60
70
80
90
100

Mar 3 1970
Hormay

Exp A, C Strat @ 45°F Refrig in Cold Room Ante.
Sus Sum Seed

January 3 1970 Start seeds in lab. 11:30A (72hrs)
" 4 " Drained 9:30A and into 45°F strat.

Sample No	Date of sample 1970	Strat days	No of viable seeds	Growth in 7 days @ 68°F Tips %	Germination %	Inshell
1	Jan 7	3	111	35	6	0
2	" 9	5	134	35	10	0
3	" 12	8	122	57	33	0
4	" 16	12	106	64	46	0
5	" 23	19	128	76	61	2
6	" 30	26	122	61	43	4
7	Febr 6	33	158	64	54	12
8	" 11	38	182	64	56	14
9	" 22	49	196	69	62	14
10	Mar 2	57	140	62	56	33
11	Mar 8	63	307 (304)	69	65 (66)	41

End

Exp A, c (1)

(No 16) Exp 12-70 Strat @ 45°F

Date		Time	Germination time Days	Hrs	Tips				Germination			Strat
					No	Cum	%		No	Cum	%	
Jan 3	1970	Started soaking seed in lab @ 11:30 A										Days
Jan 4	"	Drained and into strat 45°F 9:30 A										(6)
		Sample (1)			(111)		(111V)					
Jan 7	"	8:00A	out		0	0	0		0	0	0%	(3)
8			1		No tip all germ →			supply →	5	5		
9		2:00 P	2		16	16		"	1	6		
10			3		9	25			0	6		
11			4		2	27			0	6		
12		9:00A	5		1	28			1	7		
13		9:30	6		4	32	39		0	7		
14		9:30	7		2	34	35% (End)		0	7	6%	
		Sample (2)			(136)		(134V)					
Jan 9		2:00 P	out		1	1			0	0	0%	(5)
10		12 noon	1		20	21			2	2		
11			2		12	33		tips	8	10		
12		9:00A	3		1	34		tips	3	13		
13		9:30	4		3	37			0	13		
14		9:45	5		9	46			0	13		
15		8:30	6		1	47	(End)		0	13		
16		12:00	7		0	47	35%		0	13	10%	
		Sample (3)			(124)		(122V)					
Jan 12		9:30A	out		5	5			0	0	0%	(8)
13		9:30A	1		20	25		34 tips 22 supply	25	25		
14		9:45A	2		7	32		12 tips 3 sup	15	40		
15		8:30 A	3		3	35			0	40		
16		10:30 A	4		4	39			0	40		
17		8:30 A	5		3	42			0	40		
18		8:40 A	6		2	44	70		0	40		
19		11:40A	7		1	45	57% (End)		0	40	33%	

Exp A, C Strat @ 45°F (2)

Date	Time	Germ. time (days)	Tips No	Tips Cum	%		Germination No	Germination Cum	%	Strat days
	Sample	(4)	(106)	(106 V)						
Jan 16	10:45A out	0	25	25			0	0	0%	(12)
17	8:30A	1	24	49		Tips 14 Sup 6	20	20		
18	8:40A	2	6	55		Tips x3 Sup 3	26	46		
19	11:50A	3	4	59		Tips	3	49		
20	8:50A	4	0	59			0	49		
21	6:45A	5	0	59			0	49		
22	8:00A	6	0	59	64%		0	49		
23	8:00A	7	0	59	End		0	49	46%	
	Sample	(5)	(130)	(128 V)						
Jan 23	10:45 out	0	44	44			2	2	2%	(19)
" 24	8:15A	1	22	66		Tips x3 Sup 8	31	33		
" 25	7:00A	2	7	73		Tips 32 Sup 4	36	69		
26	7:00A	3	3	76		Tips 6 Sup 1	7	76		
27	7:00A	4	3	79		Tips	1	77		
28	" "	5	2	81	76	Sup	1	78		
29	" "	6	0	81	74%		0	78		
30	" "	7	0	81.97	End.		0	78	61%	
	Sample	(6)	(122)	(122 V)						
Jan 30	7:15A out	0	37	37		2-10mm → 12 Tips 4 Sup	5	5	4%	(26)
" 31	6:45A	1	10	47			16	21		
31	11:30A	1	5	52		Tips	11	32		
Feb 1	7:45A	2	5	57			14	46		
2	7:45A	3	2	59		6 Tips 1 Sup	7	52		
3	8:00A	4	0	60		1 Tip	1	53		
4	7:45A	5	0	60			0	53		
5	7:30A	(6)	3	63			0	53		
6	7:00A	7	2	65	61%		0	53		
					(End)			69	43%	

Imp → Germination rapid; vigorous, healthy growth at this temp

Experiment A,C Strat @ 45°F (3)

Date	Time of day		Germ. time (days)	Tips No.	Tips Cum.	Tips %		Germination No.	Germination Cum.	Germination %	Strat. No. of days
	Sample	(7)		(160)	(158 V)						
Febr. 6	7:00A	out	0	53	53		1-25mm Ave 12	19	19	12%	(33)
7	7:15A		1	13	66		37 tips 5 sup	42	61		
8	7:00A	}	2	8	74		tips	18	79		
8	11:30A	}	3	0	74		"	3	82		
9	8:00A		3 3	0	74		"	2	84		
10	6:40A		4 4	3	77			1	85		
11	7:45A		5 5	0	77			0	85		
12	7:00A		6 6	0	77	-101 64%		0	85	54%	
13	7:00A		7 7	0	77			(End)			
	Sample	(8)		(186)	(182)						
Febr. 11	8:00A	out	0	70	70		10x 34mm	25	25	14%	(38)
" 11	2:00	6hrs	1 1	4	74			5	30		
" 12	8:00A	}	2 2	8	82		36 tips 1 sup	37	67		
12	3:00P	}	1 3 3	2	84		tips	9	76		
13	7:20A		2 4 4	1	85		21 tips 1 sup	22	98		
14	6:45A		3 5 5	2	87		1 sup	1	99		
21	4:30P		10 6 6 7 7	0	87	-116 64%	1 tip 2 sup	3	102	56%	
								(End)			
	Sample	(9)		(199)	(196 V)						
Febr. 22	10:30A	out	0	65	65		2" →	58	58	14%	(49)
23	8:40A		1 1	1	66		tips	30	88		
27	11:50A		5 2 2	2	68		30 tips 3 sup	33	121		
Mar 1	9:00A		7 3 3 4 4 5 5 6 6 7 7	6	74	-135 69%		0	121	62%	
								(End)			
[redacted]	Sample	(10)		(140)	(140 V)						[redacted]
Mar 2	9:15A	out	0	28	28		25" →	46	46	33%	(57)
3			1 1	1	29		tips 18 sup 2	21	67		
4	8:30A		2 2	5	34		tips	6	73		
5	8:30A		3 3	1	35		"	2	75		
6	8:30A		4 4	1	36		1 sup	1	76		
7	9:00A		5 5	0	36			0	76		
8	9:00A		6 6	0	36	8mm → 1 tip 10 2 sups		2	78		
9	9:00A		7 7	0	36	-86 69%		0	78	56%	
								(End)			

14
57
198
309

100

27
28
8
3

Experiment A,C Strat @ 45°F

24 hr soak Sus. Sum Seed Into 45°F (H₂O bath) Jan 4 9:30A

Tubs. Date	Time of day		Germ. time (days)	No.	Tips Cum.	%		Germination No.	Cum.	%	Strat. No. of days
Last	Sample	(11)		(308)	(307V)						
Mar. 8	9:00 AM	out	0	66	66			125	125	41	(63)
9	8:00 AM	}	1	5	71		27 tips 3	30	155		
9	3:00 PM	}	2	2	73		Tips	10	165		
10	8:30 AM	2	3	1	74		Tips 17	17	182		
11	7:00 AM	3	4	0	74		5 tips 3 sup	8	190		
12	8:30 AM	4	5	6	80		5 tips 1 sup	6	196		
13	8:00 AM	5	6	4	84	21V	3 sup 2 tips	3	199		
14,15	8:00 AM	6&7	7	3	87	69%	1 sup	1	200	65%	66%
	Sample			( )	( )				(307V)		(304)V
		out	0						(End)		
			1	Ungerminated seeds into							
			2	30°F							
			3						65		
			4				307 / 200				
			5				184V				
			6				158 0				
			7								
	Sample			( )	( )						
		out	0								
			1								
			2								
			3								
			4								
			5								
			6								
			7								
	Sample			( )	( )						
		out	0								
			1								
			2								
			3								
			4								
			5								
			6								
			7								

91
17

32
23

Sus Summit
Petri

Experiment A,C Strat @ 45°C

Date	Time of day		Germ. time (days)	Tips No.	Tips Cum.	Tips %		Germination No.	Germination Cum.	Germination %	Strat. No. of days
	Sample	—		(	)	(	)				
		out	0	↓	↓						
			1								
			2								
			3	The ungerminated seeds remaining in							
			4	sample (11), the last sample, were stratified							
			5	@ 40°F (cold room) to stimulate further							
			6	germination and check viability of the							
			7	ungerminated seeds							
	Sample	(11)		(108 ok)	(104 V)						
March 15?			0	In to 40°F							
March 15?				—	17			0	0		
April 1	8:00A	Out strat		16	33			1	1		
" 2	8:00A		3	25	58		19 tips	20	21		
" 3	9:00A		4	10	68		28 tips	38	59		
" 6	8:00A	Back into strat 40F	5	0	68		10 tips 1 sup	17	76		
" 27	10:00A	Out of strat		12	80		3 sup	1	77		
" 28	8:30A		7	2	82		1 tips 1 sup	2	79		
	Sample	—		(	)	(	)				
" 29	10:00A	~~out~~	0	0	82		6 tips	6	85		
" 30	7:30A		1				4 tips	4	89		
May 1	8:00A	Back into strat (38F)					1 "	1	90		
May 18	10:00A	Out of strat. 14 seeds (10 tips)	2					0	90		
19	8:00A		4					10	100		
20	8:00A		5					4	104	100%	
			6					(End)			
			7								
	Sample	—		(	)	(	)				
		out	0								
			1								
			2								
			3								
			4								
			5								
			6								
			7								