

Summary

Temp 172°F Wet Sand H₂O Bath
 J P Seider '73 87% umbrality

Exposure Time hrs	Visibility %			Total	Ave	Hormay Apr. 1/74
	Exps					
	A	B	C			
1	92	84	76	752	84	
2	83	43	53	179	60	
3	73	25	42	140	47	
4	62	6	30	98	33	
5	40	4	18	62	21	
6	6	0	5	11	4	
7	0	0	0	0	0	

Summary

Bolsterbrook Temp 50°C (122°F) Wgt Seed
JP 73 87% viability

Holman
Apr 1/74

Test	1974	Exp time	Number of seed			
			Total	Calc viable	Germinated viable	% viable
A	Mar 8	1hr	119	104	96	92
	" 8	2hrs	166	144	119	83
	" 8	4hrs	141	123	68	55
	" 8	5hrs	117	102	59	58
	" 8	6hrs	154	134	7	5
B	Jan 16	1hr	94	82	69	84
	" "	2hrs	56	49	21	43
	" "	4hrs	90	78	5	6*
	" "	5hrs	80	70	3	4
	" "	6hrs	62	54	0	0
C	Mar 8	1hr	174	64	4	
	" "	2hrs	123	107		
	" "	3hrs	116	101		
	" "	4hrs	96	84		
		Other				

Experiment

Experiment TEMP 50°C (122°F) Wgt Seed
JP'73

Hrv Bath.
Deep Petri

Date	Time of Day	Germ. time (Days)		DNt	Germination				DT	No. of Days
1974					Norm	Abnor.	Gdd	Dd		
Mar 7	2 PM	Into Sack	Lab 7	70°F	{ 18 hrs					
8	8 AM	Out "			{ soak					
"	8:30	Into temp								
		Sample 1 hr		119	= germ					
Mar 8	9:30	out temp		(119)	(96V)					
25	9 AM			50	out 14"					
26	8 AM	Remainder excised								
Apr 1				15	6	30	18	→ ?		
				15						
				6						
				30						
				18						
				69						
				50						
				119						
		Sample 2 hrs		(166)	(119V)	= germ				
Mar 8	10:30	out temp								
25	9 AM			28	out					
26	8 AM			9	out					
Apr 1	10 AM			21	1 + 82 → ?	18			Balance	
				21						
				37						
				37						
				82						
				18						
				8						
				166						
		Sample 4 hrs		(141)	(68V)	= germ				
Mar 8	12:30 P	out Excised								
" 14	8:20 A	Several growing	Normality?							
14		6 slow growth	—	7	4	—	—	—		
15	8 AM				22	44				
				13	35	16				
				13	7	61	60			
				13						
				7						
				61						
				60						
				241						
								(End)		

Experiment

TEMP 50°C

Cont'd

Wet Seed

Date	Time of Day	Germ. time (Days)	DNt	Germination Norm	Abnor.	Gdd	Dd	DT	No. of Days
1974									
Mar 8	1:30P	0							
11	8:20A	3							
12									
31									
10									
50									
4									
1.7									
13	2PM	5							
14	8AM	6							
15	8AM	7							
18	8AM								

Sample 5 hrs (117 X 59) - 4 germ

out temp (Excise)

9

6 out

Norm? to 5mm

1 clean

growth slow starting, developing

19 out

6 "

0 18

3

10

50

3

12

31

28

50

4

Sample 6 hrs (a) (59) ()

Mar 8 2:30

0 out temp

Into 40°F

Mar 18 8AM

8

0

4

42

5 temp

(More lost in dish to be excised)

6 hrs (b)

(100)

14

?

3

72

5

3 clean

6

3

72

5

20

3

72

5

Sample

0

(154)

(71903m)

Summary

6 hrs (a) (b)

28

0

7

114

5

End

10

7

114

5

134

This is report lost

Experiment

TEMP

Dry seed

40°C

Mixed Silver lake #1 & #2 seeds small glass jars H₂O Bath

Date	Time of day	Germ. time (days)	No.	Tips Cum.	%	Germination No.	Cum.	%	No. of days
------	-------------	-------------------	-----	-----------	---	-----------------	------	---	-------------

Apr 12 8:30A Into temp

Sample 1hr (48) ()

Apr 12 9:30A 0 out temp waited

Norm 0 0 { 42 adventitious root would grow
Ab. 100 100 6 to 8mm dia
Dd 0 0 Normal 0
Dd 0 0 0
48

(End)

Norm 0 0
Abn. 42 88
G. Dried 6 12
Dd 0 0
48 100

Sample 6hrs (44) ()

Apr 12 2:30A 0 out temp waited

Norm 0 38 Ad roots would grow
Abn. 100 6 to 10mm dia
Dd 0 44

(End)

Sample 24hrs (48) ()

April 13 8:30A 0 out temp waited

Norm 0 42 Ad roots
Abn. 100 5 to 12mm dia
Dd 0 1
Normal 0

(End)

Norm 0 0
Abn. 42 88
G. dried 5 10
Dd 1 2
100

Experiment

TEMP

Dry seed

45°C

J. Peckham seed

H₂O bath lab 6

Date 1973	Time of day	Germ. time (days)	Tips			Germination			No. of days
			No.	Cum.	%	No.	Cum.	%	

March 27 8:45 A Seed into 45°C glass jars

①

Sample

1 hr

(65)

March 27 9:45 A 0 Out. Into soak Excised on 3/28 2 PM
28 10 AM 1 No growth or slight

31 9 AM

Most growing
None harmed

Harmon Ab Def
No germ No germ No germ
lost + + +

Apr 2 8 AM

0 0 65 65 0 0

0
100
0

50% would grow prob

(End)

②

Sample

6 hrs

(48)

March 27 2:45 0 Out. Into soak Excised 3/28 2 PM
28 10 AM 1 No growth or slight

31 9 AM

lost + + +

Apr 2 8 AM

0 0 48 48 0 0

0
100
0

50% prob would grow

(End)

③

Sample

24 hrs

(53)

March 28 8:45 A 0 Out Into soak
29 1 PM Excised

31 10 AM

Most growing

Apr 2 8 AM

1 1 52 52 0 0

2
98
0

30% prob would grow

(End)

Experiment

Temp Dry seed

45°C

Date 1973	Time of day	Germ. time (days)	No.	Tips			No.	Germination			No. of days
				Cum.	%			Cum.	%		

These seeds treated, and then into 34°F strat - Mar 27 1973

May 14 out strat Sample 4 hrs @ 45°C (68) (63 v) %
 May 17 10 AM Normal 15 15 24 out
 21 9 AM { Abnormal. Stunted roots 48 63 76
 but would grow
 Nonviable. 5 0

Sample () ()
 0

Sample () ()
 0

Experiment

Date	Time of day	Germ. time (days)	No.	Tips Cum.	%	Germination			No. of days
1973						No.	Cum.	%	

Horm	Abm	Dd
------	-----	----

14	10:00:4
----	---------

Normal σ σ

All roots 46. 90

Gr to 10 mm 4 diad

Del 1 2

Norm 0

Norm	0
------	---

Abnorm 46

G Diad	4
--------	---

David 1

Apr 18 2:30P 0 pct

14		10 AMP
----	--	--------

Most white but no growth 0 0 0 0 0 0

[illegible][illegible]

24 P13 ✓ As for 1hr

Grise Bogen 12 but dried 91

Dd. 2 - 1 3

(End)

Torontokod ???

Apr. 13 8:30 A

0 Oct

Could not find dish.

Normal 0 19

Ad roots 6

to 10 mm 25 diol 7

Dd 10 32

46

%

0

13

25.

3

90

Experiment

Temp Dry seed 50°C

Date	Time of day	Germ. time (days)	No.	Tips Cum.	%	Germination			No. of days
						No.	Cum.	%	
Apr. 12									
May 14									
May 17									

TEMP

Dry seed

550

Date	Time of day	Germ. time (days)	No.	Tips Cum.	%	Germination No.	Cum.	%	No. of days
1973									
See 45°C for other details									
⑦ Sample 1 hr (65) Mar 27 9:45A 0 cut soaked 28 9 PM 0 excised 29 10 AM 0 No growth or slight 31 10 AM 0 about 80% growing Apr 2 8 AM 0 3 close normal 6 0 Norm 0 Abn. 30 G. died 18 Dead 0 3 3 0 0 48 00 30 prob grow (End)									
⑧ Sample 6 hrs (65) Mar 27 2:45P 0 cut soaked 28 3 PM 0 Excised 29 10 AM 0 No growth or slight 31 10 AM 0 Most growing Apr 2 8 AM 0 None normal. All root tip injury 6 10 AM 0 2 2 0 0 65 65 00 0 50% prob would grow 100 0 sprout roots (End)									
⑨ Sample 24 hrs (78) March 29 1 PM 0 Excised 31 10 AM 0 10% growing Apr 2 0 Norm 0 Abn. 2 G. died 6 Dead 70 0 0 8 8 70 70 100 Border fatal 2 prob would grow 50% slight curve " no growth (End)									

Experiment Temp Dry seed 55°C

[illegible]

Experiment

TEMP

Dry Seed

60°C

Date	Time of day	Germ. time (days)	Tips			Germination			No. of days
			No.	Cum.	%	No.	Cum.	%	

See 45°C for other details

Norm Abn. Del
No G No G No G

(10)

Sample

1hr

Mar 27 9:45

0 out soaked

28

Excised

29

10 AM

No growth or slight

31

10 AM

Most growing Left. 4 4

Apr 2

8 AM

" " none normal

0 0 53 00

all root tip injury

0

100

0

(End)

75 prob grow

(11)

Sample

6hrs

Mar 27

9:45

0 out soaked

28

Excised

29

10 AM

No growth or slight.

31

10 AM

Most growing Left. 4 4

Apr 2

8 AM

None normal rt. injury

0 0 65 00

0

100

0

(End)

(12)

Sample

24hrs

March

29

1 PM

Excised.

31

10 AM

A few curving

Norm

0

Abnorm

54

Del

78

0

66

34

87

(End)

Experiment Temp Dry seed 60°C

[illegible]

Experiment

TEMP

Dry seed

65°C

Date 1973	Time of day	Germ. time (days)	No.	Tips		Germination			No. of days
				Cum.	%	No.	Cum.	%	
March 29	10 AM	Into temps		65°C	70°C, 75°C				240°C
		(13) Sample 1 hr		(57)	()				
Mar 29	11 AM	0 out							
" 30		Excised							
Apr. 2	8 AM	50% curving or growing							
		2 Normal 11							
		95 Abnormal 54							
		3 Del 2							
									57
									(End)
		(14) Sample 6 hrs		(69)	()				
Mar 29	4 PM	0 out							
Apr. 2	8 AM	5% curving 95 no growth							
		0 Normal 0							
		76 Abnormal 18 Pos 3 grow							
		74 Del 51							
									69
									(End)
		(15) Sample 24 hrs		()	()				
Mar 30	10 AM	0 out							
Apr 2		0 No growth All gray Lateral Pos.							
		100							End

Experiment

TEMP

Dry seed 70°C

Date	Time of day	Germ. time (days)	No.	Tips Cum.	%	Germination No.	Cum.	%	No. of days
------	-------------	-------------------	-----	-----------	---	-----------------	------	---	-------------

See 65°C

(16)

Sample

1hr

(69)

)

Mar 29

11AM

out

excised

" 30

Apr 2

8AM

No growth

0
75
75

Normal 0

Abnormal 52

Def 17

5 possibly grow

(End)

(17)

Sample

6hrs

(62)

)

Mar 29

4PM

out

Excised

" 30

Apr 2

8AM

No growth. Most gray. Appears lethal

6

10AM

All dead

Lethal

0
0
100

(18)

Sample

24hrs

(68)

)

Mar 30

10AM

out

excised

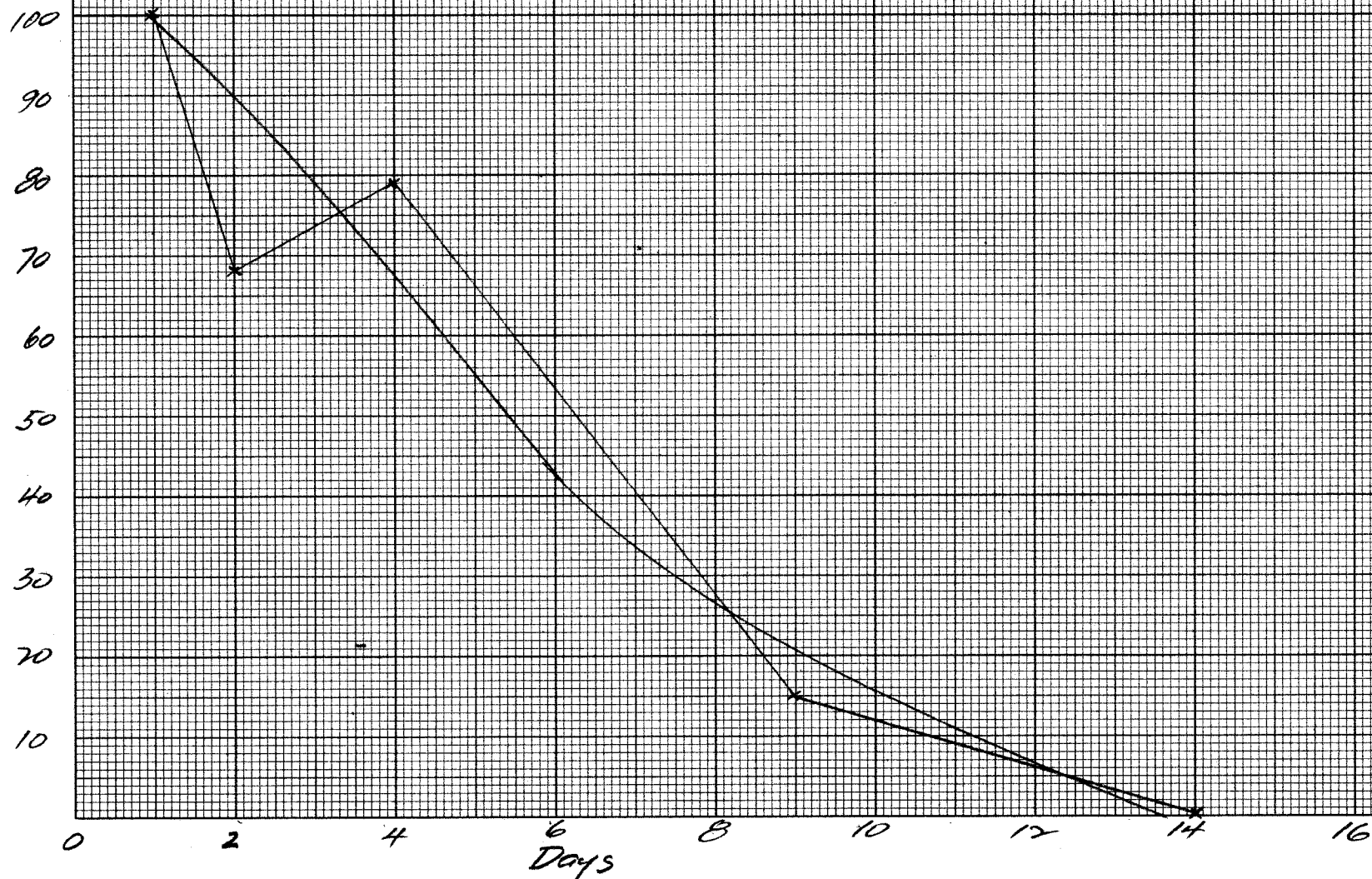
Apr 2

0
0
100All gray
No growth

Lethal Pos

(End)

Temperature Dry Seed 104°F
Harm and abnormal



Dry Seed

Experiment

Temp 104°F

H₂O bath

Harper (Rocks)

Date 1973	Time of day	Germ. time (days)	No.	Tips			Germination			No. of days
				Cum.	%		No.	Cum.	%	
Oct 15	noon									② 104°F
		Sample	(1)	(76)						(1)
Oct 16	noon	0	out watered							
" 17	9:30 A	0	Excised							
" 19	8:30 A	2	Most growing							
			{ All abnormal				0			
25	8:00	8	Dead				76	Adv. roots	100%	0
							0			0
							End			
		Sample	(2)	(68)						(2)
Oct 17	noon	0	out watered							
" 18	10:30	0	Excised							
" 19	8:30	1	No growth							%
			{ Norm.				0			0
{ 25	8:00	7	Abnorm. Advs				1034	44 out + 2	46	68
{ 29	8 AM	11	Germ died				? 22		22	32
			Dead						0	0
			Root tips injured						68	100
			Border Abnorm - Germ died							
		Sample	(3)	(48)					%	(4)
Oct 19	8 AM	0	out watered				0		0	
			{ Norm							
			{ Abnorm Adv. roots				38		79	
29	8 AM	10	Germ died				9.10		21	
			Dead				0		0	
			Same as for 2 days				48		100	
		(4)	(47)							
Oct 24	8 AM		out watered						%	(9)
29	8 AM	5	Viability?				1		0	
			Normal				0		15	
31	8 AM	7	Abnorm Adv. roots				39		83	
			Germ died				1		2	
			Dead				47		100	

Dry Seed

Experiment

Temp 104°F

H₂O Bath

Harper Rocks

Date	Time of day	Germ. time (days)	No.	Tips Cum.	%	Germination No.	Cum.	%	No. of days
------	-------------	-------------------	-----	-----------	---	-----------------	------	---	-------------

1973

Norm About 6.201 Dead

Exposure @ 104°F

Sample 5

(14)

Oct 29 9AM
30 9AM
31 9AM
Nov 1 8AM
2 8AM

0 Oct worked
0 Excised
1 no growth

Most gray

2 " " " "
3 { " " " "
Appears all dead or will die

0 0 14 86
0 0 14 86 %

Lethal End

Sample 0

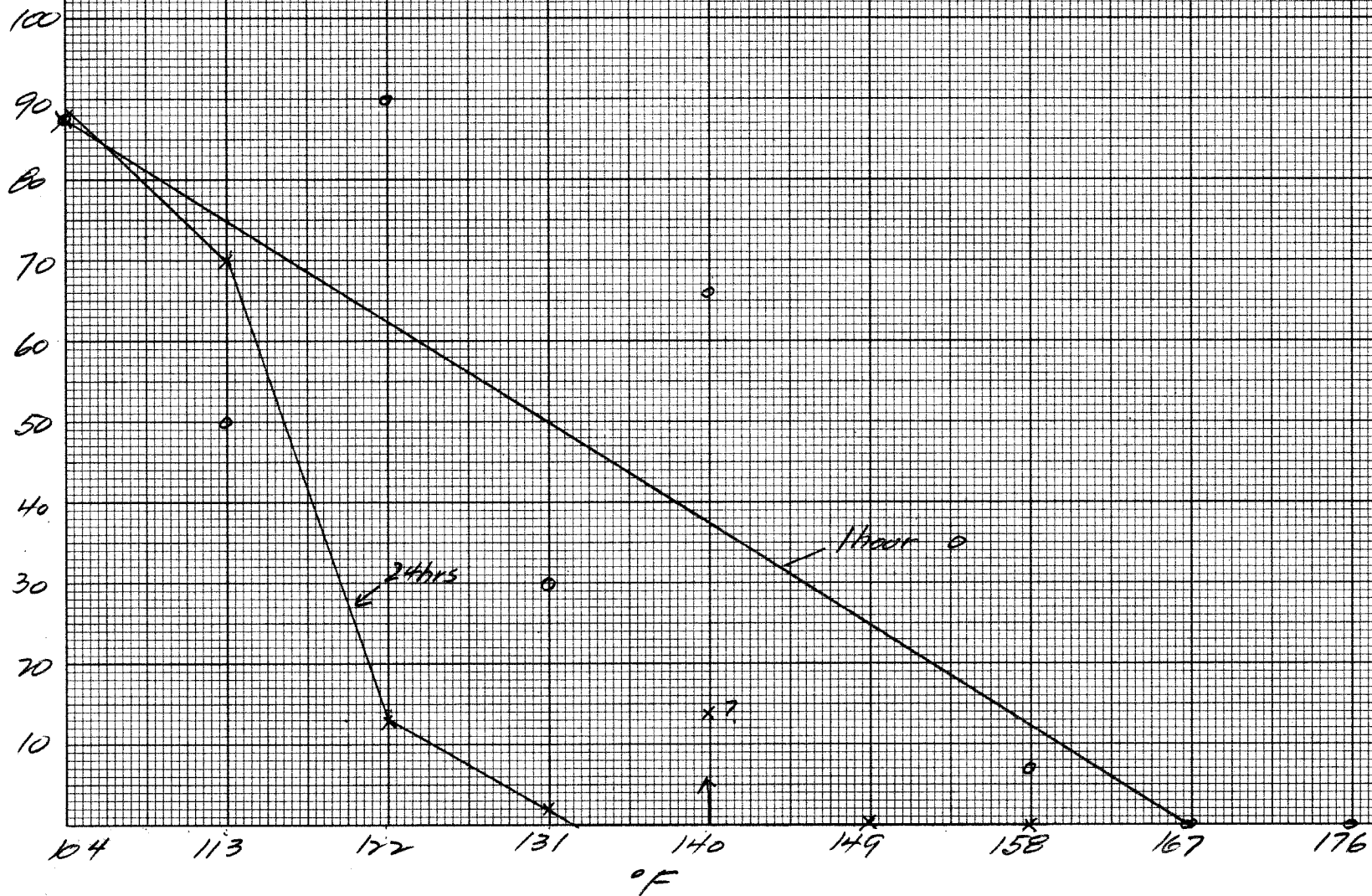
Sample 0

Temp Dry Seed 40°C

Germination

Normal

Abnormal



Temp Dry Seeds (P4)

Nov. 2/73

104°F

113

172

131

Holmsey

40°C

45°C

50°C

55°C

Apr. 73

Peiffer

Silver

Mar 27

Mar 27

H₂O

By
Start
Hrs

By
Start
Hrs

By
Start
Hrs

1 hour

Normal

0

0

24

0

26

0

30

Abnormal

88

50

76

90

74

30

22

Germ died

12

50

0

8

0

18

48

Dead

0

0

0

2

0

0

0

24 hours

Normal

0

2

0

0

Abnormal

88

70

13

2

Germ died

10

28

54

8

Dead.

2

0

33

90

140

149

158

167

176

60°C

65°C

70°C

75°C

80°C

By
Start

1 hour

Hrs

Norm

0

7

2

0

0

0

Abnorm

66

37

95

7

0

0

Germ died

34

56

1

68

9

0

Dead.

0

0

3

25

91

100

24 hours

Norm

0

0

0

Abnorm

66

0

0

Germ died

66

0

0

Dead

34

100

100

Experiment

TEMP

Dry seed

75°C

Note 80°C 1hr
below

Date	Time of day	Germ. time (days)	No.	Tips		%	Germination			No. of days
				Cum.			No.	Cum.	%	

See 65°C

(19)

Sample

1hr

(65) ()

Mar 29 11 AM

Apr 2 8 AM

6 10 AM

0 out

No growth or curving

6 curving. Gets cedar but will die

0

59 Dead gray

Just lethal

0

100

(End)

(20)

Sample

6hrs

(67) ()

Mar 29 11 AM

Apr. 2 8 AM

0 out

All gray dead

0

0

100

Lethal pos.

(End)

(21)

Sample

24hrs

() ()

Mar 30 10 AM

0 out

X

No need

(1hr)

decided

No growth

" "

80°C

(48)

(End)

Lethal several white airburs gray.

Mar 31 9 AM

Apr 2 8 AM

6 10 AM