

# Stratified (Storage) 28°F frozen

Effect temp. on wet seed.

## Experiment

5W 1961

Seed into non aerated water at 28°F  
for 46 days. Water froze and remained  
frozen through period

Seed removed at end of 46 days  
and excised. All viable germinated  
not injured in the least

# Checks Germination

ended

GERMINATION AND GROWTH

28°F

Purpose Start in H<sub>2</sub>O (non germinated)

Exp. no. SN-601

Date started \_\_\_\_\_

Sample no. \_\_\_\_\_

No. days treated \_\_\_\_\_

Name \_\_\_\_\_

Date:

Time of day:

Seed treatment

Mar 10

Into H<sub>2</sub>O and 28°F

Water froze and remained frozen throughout start period

## Germination statistics

Total seeds used \_\_\_\_\_

Total germinated \_\_\_\_\_

a) Sound \_\_\_\_\_

b) Defective \_\_\_\_\_

Total ungerminated \_\_\_\_\_

a) Sound (excised) \_\_\_\_\_

b) Defective (excised) \_\_\_\_\_

## Germination details

| No. of days germ.  | Germ. no.    | Length of:   |            | Germ. % | Notes |
|--|--------------|--|------------|---------|-------|
|  |              | Roots (In.)  | Tops (In.) |         |       |
| <u>April 25</u>  | <u>4 PM</u>  | <u>out of start and excised 36 embryos</u>   |            |         |       |
| <u>27</u>  | <u>11 AM</u> | <u>2 embryos defective The rest growing roots are 5/8" long. Most coloring. No damage evident.</u> |            |         |       |
| <u>28</u>  |              | <u>100% germination and normal growth of viable embryos<br/>Roots to 3/4" average 5/8" (and)</u>   |            |         |       |
| <u>Seed is not injured in the least frozen in water @ 28°F for 46 days</u> |              |  |            |         |       |

(and)

# Graph H<sub>2</sub>O (A)

Strat H<sub>2</sub>O 41°F to 105°F  
(strat)

Tabulated  
Apr 27/73

(see  
ALH)

Aeration strat checks (

seal)

See SW-61 attached for effect of 78°F

| Experiment      | °F    |   |
|-----------------|-------|---|
| SW 61 1961      | 41    | Seed stored in non aerated H <sub>2</sub> O at 41°F for <u>45 days</u><br>Excised 33 seeds at end of period<br>3 damaged discarded<br>30 undamaged<br>13 embryos grew normally<br>17 " grew abnormally, segmented and died. |
| Tab             | 43%   |   |
| " " "           | 48°   | 45 day strat as for 41<br>Excised 27<br>1 damaged<br>26 undamaged<br>1 grew normally<br>25 segmented, glassy, stunted, cety ledons with waxy edges. all died  |
| " " "           | 49/10 |   |
| " " "           | 55°   | 45 day strat<br>Excised 32<br>10 curved slightly - some roots to 4"<br>All 32 died in 6 days  |
| " " "           | 68    | All dead when excised.  |
| " " "           | 90°   | Strat in nonaerated H <sub>2</sub> O <u>4 days</u><br>Excised 27 all germinated but odd color; some glassy  |
| Buttermilk seed |       |   |
| " " "           | 90°   | Strat <u>32 days</u> all dead   |
| " " "           | 105°  | { Strat <u>4 days</u> all dead<br>" <u>10 "</u> " "   |

These stored - 40°F to 105°F stored in H<sub>2</sub>O  
 (a)

41°F

GERMINATION AND GROWTH

Purpose Check on germination  
in H<sub>2</sub>O

Exp. no. SW-61

Date started \_\_\_\_\_

Sample no. \_\_\_\_\_

No. days treated \_\_\_\_\_

Name \_\_\_\_\_

Date: \_\_\_\_\_ Time of day: \_\_\_\_\_ Seed treatment \_\_\_\_\_

Mar 10 Into H<sub>2</sub>O

Germination statistics

Total seeds used \_\_\_\_\_  
 Total germinated \_\_\_\_\_  
 a) Sound \_\_\_\_\_  
 b) Defective \_\_\_\_\_  
 Total ungerminated \_\_\_\_\_  
 a) Sound (excised) \_\_\_\_\_  
 b) Defective (excised) \_\_\_\_\_

Germination details

|                                     | No. of days germ. | Germ. no.         | Length of:  |            | Germ. %      | Notes   |
|-------------------------------------|-------------------|-------------------|-------------|------------|--------------|---|
|                                     |                   |                   | Roots (In.) | Tops (In.) |              |   |
| <u>Apr 24 out of H<sub>2</sub>O</u> |                   |                   |             |            |              |   |
| <u>25 IPA excised</u>               |                   | <u>33 embryos</u> |             |            | <u>(30%)</u> |   |
| <u>27</u>                           |                   |                   |             |            |              | <u>3 seed defective not curving the rest growing; 27 colored. Damage slight growing roots are about 3/8" long</u> |
| <u>28</u>                           |                   |                   |             |            |              | <u>13 embryos growing normally roots to 1" are 5/8" the rest abnormal segmented stunted</u>                       |
| <u>May 2</u>                        |                   |                   |             |            |              | <u>the 13 remaining all abnormal. All dying and will die. 4 may have grown in soil</u>                            |

Summary (33)(30%)  
 Normal 13 43% } 45 days storage or stent  
 Abnormal 4 14 }  
 Germ died 13 43 }  
 100

(end)

Stored in H<sub>2</sub>O  
@  
48°F

GERMINATION AND GROWTH

see II  
below

Purpose \_\_\_\_\_

Exp. no. SW-61

Date started \_\_\_\_\_

Sample no. \_\_\_\_\_

No. days treated \_\_\_\_\_

Name \_\_\_\_\_

Date: \_\_\_\_\_ Time of day: \_\_\_\_\_

Seed treatment \_\_\_\_\_

Mar 10

Germination statistics

Total seeds used # I \_\_\_\_\_  
 Total germinated \_\_\_\_\_  
 a) Sound \_\_\_\_\_  
 b) Defective \_\_\_\_\_  
 Total ungerminated \_\_\_\_\_  
 a) Sound (excised) \_\_\_\_\_  
 b) Defective (excised) \_\_\_\_\_

Germination details

|          | No. of days germ. | Germ. no. | Length of:  |            | Germ. % | Notes   |
|----------|-------------------|-----------|-------------|------------|---------|---|
|          |                   |           | Roots (In.) | Tops (In.) |         |   |
| <u>I</u> |                   |           |             |            |         |   |
|          | Apr 24            |           |             |            |         | out of H <sub>2</sub> O 2PM   |
|          | 25                |           |             |            |         | 1PM excised 27 embryos  |
|          | 27                |           |             |            |         | 11AM } 1 distorted seed (not curving)<br>26 curving; of these 3 colored reddish                         |
|          | <del>28</del>     |           |             |            |         | Seed damage evident grey glassy cols roots<br>growing roots average - 3/16" long                        |
|          | 28                |           |             |            |         | Only one embryo growing normally root 3/8"<br>The rest segmented, glassy stunted.                       |
|          | May 2             |           |             |            |         | All embryos dying and will die. Even cotyledons<br>with wavy edges (compare with construction of roots) |

(end)

II this lot of seed from above treatment into Petri dish

|         |      |   |        |    |   |               |
|---------|------|---|--------|----|---|---------------|
| Apr. 24 | 2PM  |   |        |    |   |               |
| Apr. 30 | 11AM | 9 | to 3/8 | 9  | 3 | normal growth |
| May 2   |      | 7 |        | 16 | 6 | " "           |

not all seed "drowned" at 48°F H<sub>2</sub>O storage for 45 days

GERMINATION AND GROWTH

55°F

Purpose Strat in H<sub>2</sub>O

Exp. no. SW-61

Date started \_\_\_\_\_

Sample no. \_\_\_\_\_

No. days treated 45

Name \_\_\_\_\_

Date:

Time of day:

Seed treatment

Mar 10

Into H<sub>2</sub>O @ temp.

Germination statistics

Total seeds used \_\_\_\_\_

Total germinated \_\_\_\_\_

a) Sound \_\_\_\_\_

b) Defective \_\_\_\_\_

Total ungerminated \_\_\_\_\_

a) Sound (excised) \_\_\_\_\_

b) Defective (excised) \_\_\_\_\_

Germination details

| No. of days germ. | Germ. no. | Length of:  |            | Germ. % | Notes   |
|-------------------|-----------|-------------|------------|---------|---|
|                   |           | Roots (In.) | Tops (In.) |         |   |
| Apr 24            |           |             |            |         | out of water and temp   |
| Apr. 25           |           |             |            |         | excised 32 embryos  |
| April 27          |           |             |            |         | 19 embryos no sign of growth gray cot's<br>3 with roots 1/4" cot's and bypus reddish<br>10 some curving. Five or 6 might grow Roots<br>32 of these average 3/16" long |
| April 28          |           |             |            |         | None normal 19 dead dark gray<br>5 nearly dead<br>8 with roots are 1/4"   |

April 30 all dead Probably none would have grown in soil

(and)

H<sub>2</sub>O

68°F

GERMINATION AND GROWTH

Purpose Start in non aerated H<sub>2</sub>O

Exp. no. SW 61

Date started \_\_\_\_\_

Sample no. \_\_\_\_\_

No. days treated \_\_\_\_\_

Name \_\_\_\_\_

Date:

Time of day:

Seed treatment

Mar 10

Into H<sub>2</sub>O @ 68°F

Germination statistics

Total seeds used \_\_\_\_\_

Total germinated:

a) Sound \_\_\_\_\_

b) Defective \_\_\_\_\_

Total ungerminated:

a) Sound (excised) \_\_\_\_\_

b) Defective (excised) \_\_\_\_\_

Germination details

| No. of days germ. | Germ. no.                    | Length of:     |                    | Germ. % | Notes      |
|-------------------|------------------------------|----------------|--------------------|---------|------------|
|                   |                              | Roots (In.)    | Tops (In.)         |         |            |
| <u>Apr. 11</u>    | <u>Out of H<sub>2</sub>O</u> | <u>Excised</u> | <u>- All dead.</u> |         |            |
|                   |                              |                |                    |         | <u>and</u> |
|                   | <u>21</u>                    |                |                    |         |            |
|                   | <u>10</u>                    |                |                    |         |            |
|                   | <u>31</u>                    |                |                    |         |            |

H<sub>2</sub>O

Buttermilk  
Seed

GERMINATION AND GROWTH

90°F

Purpose Shot in non-aerated H<sub>2</sub>O

Exp. no. SW-61

Date started \_\_\_\_\_

Sample no. #1 cc #2

No. days treated \_\_\_\_\_

Name Hormay

Date:

Time of day:

Seed treatment

Mar 10 9 AM

Into H<sub>2</sub>O and temperatures

Germination statistics

Total seeds used \_\_\_\_\_

#1 30 (27)

#2

Total germinated \_\_\_\_\_

a) Sound \_\_\_\_\_

b) Defective \_\_\_\_\_

Total ungerminated \_\_\_\_\_

a) Sound (excised) \_\_\_\_\_

b) Defective (excised) \_\_\_\_\_

Germination details

|                           | No. of days germ. | Germ. no.  | Length of:                                    |            | Germ. %     | Notes                               |
|---------------------------|-------------------|------------|---|------------|-------------|-------------------------------------|
|                           |                   |            | Roots (In.)                                   | Tops (In.) |             |                                     |
| <u>#1</u>                 |                   |            |   |            |             |                                     |
| <u>Mar 14 9 AM</u>        |                   |            | <u>Out of temp H<sub>2</sub>O and excised</u> |            |             |                                     |
| <u>Mar 15 9 AM</u>        |                   |            | <u>Most curving</u>                           |            |             |                                     |
| <u>Mar 30 11 AM</u>       |                   | <u>27</u>  |   |            | <u>100%</u> | <u>These all color, some glassy</u> |
|                           |                   | <u>and</u> |   |            |             |                                     |
| <u>#2</u>                 |                   |            |   |            |             |                                     |
| <u>April 11 11 AM out</u> |                   |            | <u>Excised - all <del>dead</del> dead</u>     |            |             |                                     |



H<sub>2</sub>O

105°F

Buttermilk  
seed

GERMINATION AND GROWTH

Purpose Start in non aerated H<sub>2</sub>O

Exp. no. SW 61

Date started \_\_\_\_\_

Sample no. 1 & 2

No. days treated \_\_\_\_\_

Name Horsing

Date: \_\_\_\_\_ Time of day: \_\_\_\_\_

Seed treatment \_\_\_\_\_

Mar 10 9AM

Into H<sub>2</sub>O and temp.

Germination statistics

Total seeds used 31 (31V) (38V)  
 Total germinated 21 some growth none grew  
 a) Sound \_\_\_\_\_  
 b) Defective 21  
 Total ungerminated 10 decayed.  
 a) Sound (excised) \_\_\_\_\_  
 b) Defective (excised) \_\_\_\_\_

Germination details

|             | No. of days germ. | Germ. no. | Length of:                  |            | Germ. %                          | Notes     |
|-------------|-------------------|-----------|-----------------------------|------------|----------------------------------|-----------|
|             |                   |           | Roots (In.)                 | Tops (In.) |                                  |           |
| #1          |                   |           |                             |            |                                  |           |
| Mar 14 9AM  |                   |           | <u>Out and excised</u>      |            |                                  |           |
| Mar 15 9AM  |                   |           | <u>None curving</u>         |            |                                  |           |
| Mar 20 11AM |                   | <u>21</u> | <u>to 3/8</u>               |            | <u>Glassy; All prob will die</u> |           |
|             |                   |           | <u>(end)</u>                |            | <u>constricted</u>               | <u>0%</u> |
| #2          |                   |           |                             |            |                                  |           |
| Mar 20 3PM  |                   |           | <u>Out and excised</u>      |            |                                  |           |
| Mar 27 10AM |                   |           | <u>None grew; all dead.</u> |            |                                  | <u>0%</u> |
|             |                   |           | <u>(end)</u>                |            |                                  |           |