

2/12/63

Dioscorea Villosa

- 2/12/63 Used pot from right to left *Brodiaea* which has good sandy soil. Planted 14 seeds (10 in a circle plus 4 inside as a square). Watered well.
- 23/12/63 Dug up top half inch of pot. Recovered all 14 seeds of *Dioscorea*. Not a one had even started to sprout, also recovered two of bulbs of *Brodiaea*. Both were rotten.
- 24/12/63 Took 14 new seeds. Slit one side near edge with a razor blade. Planted them in same pot in same manner. Watered well.
- 25/12/63 Took 14 new seeds. Put in fridge tray between blotting paper and started soaking but not freezing.
- 29/12/63 Put to freezing
- 23/2/64 Dug up seeds planted on 24/12/63. Recovered 12 seeds, all quite hard. No sign of sprouting. Most had lost part of vane. Put them in fridge tray + started freezing.
- 23/2/64 also put 14 more new seeds to freezing.
- 10/5/64 Took all out of fridge and let thaw.
- 26/5/64 Removed all three groups from wet tray + put into Petri dishes
- 29/5/64 Put into petri dishes seed planted on 2/12/63 and dug up on 23/12/63.
also 14 new seeds from pods having 1, 2, 3 seeds.
- 1/6/64 Three of seeds have white spots on top.
- 9/6/64 One of seed 23/2/64 has swelled quite a lot and a white paste is coming out of top.
- 16/6/64 Two of seeds 23/2/64 have white paste coming out. Really mould.
- 15/6/64 Started 14 more seeds soaking between blotting paper.
- 21/6/64 Put these 14 to freezing.

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- 23/6/64 Put all three petri dishes into an oven held at 70° to 75° F.
- 29/6/64 Two seeds dated 25/12/63 have root sprouts coming out of bottoms. Planted these in an evaporating dish. One seed with longest sprout about $3/4$ " in from spout, other seed with small sprout $3/4$ " in exactly opposite. Placed on glass cover to reduce evaporation and placed in same oven.
- 2/7/64 Raised temperature to about 27°C = 80° F. Replanted the two ^{sprouted} seeds above into plastic tumblers along with two more. Now have 4 seeds each in 2 tumblers dated 25/12/63 and 1 tumbler dated 2/12/63. Total 12 sprouts.
- 6/7/64 Four seeds have come up with green shoots. Transferred these two tumblers to warm can room to get away from fumes in laboratory. Three of seeds marked 23/2/64 have rotted. Threw out.
- 9/7/64 Six green shoots have come up. The three in tumbler marked 2/12/63 are 1" to $1\frac{1}{2}$ " high. They hit watch glass on top and turned over. Took off watch glass and placed these plants in window of my office. The three green shoots in two tumblers marked 25/12/63 are about $\frac{1}{2}$ " high. Put remaining tumbler and 3 petri dishes in warm can room.
- 10/7/64 Two tumblers marked 25/12/63 also put in office. The tips of shoots on these plants also turned over even tho they never touched cover glass. Apparently the turned over tip is characteristic of this plant.

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- 13/7/64 The six plants are growing very slowly due to cool environment in office. However the tips are now about horizontal and leaf buds more prominent. A new small shoot has appeared. Put it in separate tumbler and placed in 80°F can room. The top 1/4" of stems of six plants show purple brown color. Rest of stem remains white to light cream color.
- 14/7/64 Examined all seeds closely. The group 24/12/63 were all rotten and were discarded. The remaining seeds were removed from Petri dishes and put back in fridge tray and set to freezing again.
- 24/7/64 Six plants doing well. One has leaf wide open. Three have leaves partly open. Two have green leaf buds. One plant has a constriction at base of leaf bud which is very small and turning brown.
- 6/8/64 Six plants have single leaf wide open. No sign of any secondary leaves. Stalks 2 1/4 to 3 1/2" high. No activity in seventh plant.
- 10/8/64 One of six plants has quite small leaf with edges beginning to turn up. It may have been touched by cold or perhaps allowed to dry out a bit too much.
- 11/8/64 Dug up the plant without a leaf. Root only 5/16" long.
- 18/8/64 Put 1/8" dia metal stake near 5 plants & tied about 2" above ground. Sixth plant continuing to dry up. Put all in glass house.
- 20/8/64 Sixth plant dried out down to 3/4" above ground. Dug it up. Root only 5/8" long.
- 24/8/64 Five plants about same. Too cool for growth. Stalks have turned dark purple and leaves a bit larger.

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- 17/9/64 Put about 15 cc of ammonium nitrate solution on each
- 21/9/64 Five plants are not making much progress. All are in range $3\frac{1}{2}$ to 4" high with one fair sized leaf. One plant has a second stalk coming up with small leaf. It is about $\frac{1}{2}$ " high.
- 28/9/64 Two plants now have second stalks. Growth very slow.
- 8/10/64 Two plants with second stalk doing fairly well. Look healthy but very slow progress. One plant as is. One plant with very small second stalk dying. One plant dead. Perhaps I've kept them too wet. I'll let dry a bit more.
- 12/10/64 Started watering again.
- 5/11/64 All dead. Three plants sent up feeble second shoots which never got beyond $\frac{3}{4}$ " high. They just withered and died for no apparent cause.

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3/12/63

Seeds in		3 Vanes	2 Vanes	1 Vane
Pods	Number	13	11	14
	Average milligrams	89.0	69.1	43.4
Seeds	Total number	53	31	17
	Number per pod	4.07	2.82	1.22
	Average milligrams	10.04	10.25	10.45
	Standard deviation	0.8	1.0	1.3
Shucks	Average milligrams	47.9	40.5	31.1
	Standard deviation	3.6	4.2	4.1
(Weight Seed) / (Weight Shucks)		.856	.713	.408

A vane frequently has more than one seed.

Weight of a seed is independent of number of vanes filled.

Pods with unfilled vanes have lighter shucks. Apparently

the unfilled vanes are thinner than filled vanes.

Ratio (Weight of Seed) / (Weight of Shucks) decreases as number of unfilled vanes increases.

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Weights in tens of
milligrams

29/11/63

Pod	Seeds		Shuck	Seed		Shuck		
	No	Wt		Dev	Dev ²	Dev	Dev ²	
10.52	5	5.00	1.00	5.54	-.02	4	+75	.56
8.32	3	3.37	1.12	4.93	+10	100	+14	.02
7.92	3	3.15	1.05	4.78	+03	9	-.01	0
9.58	5	4.68	.94	4.83	-.03	64	+04	0
8.18	3	3.54	1.18	4.63	+16	256	-.16	.03
10.72	5	5.46	1.09	5.24	+07	49	+45	.20
7.64	3	2.84	.95	4.78	-.07	49	-.01	0
8.51	4	3.95	.99	4.54	-.03	9	-.25	.06
10.19	6	5.69	.95	4.53	-.07	49	-.26	.07
7.34	3	3.22	1.07	4.08	+05	25	-.71	.51
8.74	4	4.00	1.00	4.72	-.02	4	-.07	.01
10.19	6	5.58	.93	4.65	-.09	81	-.14	.02
7.71	3	2.73	.91	5.00	-.11	121	+21	.04
Sum	115.56	53	53.21	13.18	62.25		820	1.52
N	13	13	53	13	13	5	.08	.36
Average	8.90	4.07	1.004	1.015	4.79			

$$\frac{53.21}{62.25} = 0.856 \frac{\text{wt seed}}{\text{wt shuck}}$$

$$53.21 + 62.25 = 115.46 \text{ computed}$$

Full Pods

Seeds in all three wanes

Pods with one empty vane

Pod	Seeds			shuck	Seed		Shuck	
	No	Wt	Wt/seed		Dev	Dev ² x 10 ⁻⁴	Dev	Dev ²
7.64	3	3.21	1.07	4.44	+0.03	9	+0.39	.15
6.98	3	2.93	.98	4.00	-.06	36	-.05	0
6.70	3	2.90	.97	3.80	-.07	49	-.25	.06
6.18	2	2.45	1.23	3.76	+0.19	361	-.29	.08
8.45	4	3.61	.90	4.84	-.14	196	+0.79	.62
7.60	3	3.35	1.12	4.35	+0.08	64	+0.30	.09
6.91	3	2.92	.97	3.98	-.07	49	-.07	.01
5.76	2	2.30	1.15	3.49	+0.11	121	-.56	.31
5.57	2	2.18	1.09	3.44	+0.05	25	-.61	.37
7.10	3	2.84	.95	4.30	-.09	81	+0.25	.06
7.12	3	3.05	1.02	4.10	-.02	4	+0.05	0
Sum	76.01	31	31.74	11.45				
N	11	11	31	11				
average	6.91	2.82	1.025	1.040				
					S =	.10		.42

$$\frac{31.74}{44.50} = 0.713 \frac{\text{wt seed}}{\text{wt shuck}}$$

$$31.74 + 44.50 = 76.24 \text{ computed}$$

$$\text{Standard Deviation} = s = \left[\frac{\sum \text{dev}^2}{n-1} \right]^{1/2}$$

