

West Virginia University
COLLEGE OF ARTS AND SCIENCES
MORGANTOWN

DEPARTMENT OF BIOLOGY

June 18, 1963

Mr. Grote Reber
Commonwealth Scientific and
Industrial Research Organization
Tasmanian Regional Laboratory
Stowell Avenue
Hobart, Tasmania

Dear Mr. Reber:

I regret having delayed my reply to your letter of December 7, 1962 for such a long time. I have passed your paper around among some of my horticultural friends and I am enclosing a verifax copy of one reviewer. I am returning your paper with the suggestion that you might give some attention to the comments of the reviewer. If you then wish to re-submit the paper we shall re-consider it. Actually it lies a little outside the scope of our journal, which is chiefly concerned with floristics.

Best wishes.

Very sincerely yours,

Earl L. Core
Earl L. Core, Chairman
Department of Biology

ELC:nd

Enclosure

I read over Reber's paper a number of times and must admit that it still leaves me somewhat cold. I think the phenomenon is an interesting one but I question if Mr. Reber is actually accomplishing anything in the approach he uses. However, I am unable to constructively criticize the work except to say that his tables and figure are far from self-explanatory and should be better explained if they are published. Also I think he should explain why he uses pole position for his statistical treatment, a point which I find difficult to understand. Furthermore, I think he should show statistical treatment of the occurrence of black versus normal beans or omit this observation entirely.

I wish I could give my wholehearted support to this paper but the brevity of it makes me somewhat suspect of its value at this point.

REVERSED BEAN VINES

by Grote Reber

During the summer of 1959 experiments¹ on mechanically reversing the direction of twining were conducted at Green Bank, West Virginia, U.S.A. Similar experiments were conducted during summer of 1961-2 at Hobart, Tasmania, Australia. Three rows of plants were used. They all turned naturally counterclockwise like a righthand screw thread, the same as at Green Bank. The seeds of two rows were from Green Bank. Row A used standard seed from normal Hawaiian vines. Row B used inverted color, or black seed from both normal and reversed Hawaiian vines. Row C used Tasmanian seed locally known as Scarlet Runner. This plant seems closely related to the Lima. Seed comes in a wide variation of color combinations. The particular seed chosen was tan with fine irregular black markings, quite similar, except in size, to standard Hawaiian seed. These vines had red and white flowers. All rows were manipulated as previously described.

Row A performed well in that the plants grew to full size, matured, withered and dried. Row B was in a somewhat poorer location. Also black seed seems to produce less vigorous plants, so these vines did not grow as high as row A. Row C produced very tall plants with luxuriant foliage. However the season was too short for this variety to complete a life cycle as some immature green pods remained at top of vines when frost came. These were included with vines and deleted from study. Only fully dried pods with mature beans were included in the analysis.

The plants were divided into levels: Up to 1 foot, 1 to 4 feet, Over 4 feet. Pods having stem fastening to vine within these levels were harvested separately. If less than four pods were in a level, these were included in a lower level. The field data was analysed on a basis of equal importance for each pole position

and on a basis of combined data for each level. The results are slightly different, as shown in the table, but lead to the same conclusions. The reversed vines grown from standard seed have a higher ratio of (weight of beans)/(weight of shucks), especially at the top. The vines grown from black seed exhibit the same phenomenon up to the one foot level. At higher levels, reversing the vines causes the ratio to decrease. The matter is being looked into under more auspicious circumstances this season. It seems the phenomenon appears properly only on a sufficiently large sample of full size vigorous plants which complete a life cycle. Data for row A are plotted in the figure. All three groups produced more inverted color or black beans on the reversed vines.

1. "Reversed Bean Vines", Grote Reber, Castanea, Vol25, Dec.1960, pl22-4.

The above study needs
a more thorough
test. (over)

Follow form of major journals.

Ratios of REVERSED VINES / NORMAL VINES

SEED	Level	Twining Nor. Rev. Positions		Equal Importance for Each Pole Position					Combined Data for Each Level			
				Grams	Beans	Beans	Wt. Beans	Trials for One Chance Occurrence	Grams	Beans	Beans	Wt. Beans
				Pod	Pod	Gram	Wt. Shucks		Pod	Pod	Gram	Wt. Shucks
Hawaiian Standard	Over 4 ft.	9	12	.92	.98	.92	1.43	>100	.93	.98	.93	1.39
	1 to 4 ft.	17	17	.96	1.01	.98	1.14	13	.95	1.02	.98	1.21
	Up to 1 ft.	16	17	.92	.99	1.04	1.09	6	.98	1.03	1.03	1.11
	Entire Pole	17	17	.93	.99	1.00	1.18	50	.97	1.02	.99	1.20
Hawaiian Black	1 to 4 ft.	11	12	.85	.82	1.01	.89	2.5	.88	.86	1.03	.89
	Up to 1 ft.	16	17	.87	.95	1.06	1.12	5	.87	.96	1.06	1.11
	Entire pole	16	17	.86	.90	1.04	1.02	5	.87	.90	1.05	.99
Scarlet Runner Standard	Over 4 ft.	9	6	.96	.95	.99	1.17	4.4	.85	.88	1.04	1.05
	1 to 4 ft.	14	11	1.04	.94	1.11	1.08	>100	.94	1.00	1.05	1.06
	Up to 1 ft.	9	8	.93	.99	1.04	1.06	2.5	.88	.98	1.09	1.05
	Entire Pole	15	12	1.00	.97	1.06	1.10	5	.89	.98	1.07	1.05

		ENTIRE GROUP	
	Twining	Percent Black Beans	Reversed Normal
Hawaiian Standard	Normal	2.7	
	Reversed	3.0	1.1
Hawaiian Black	Normal	2.9	
	Reversed	4.1	1.4
Scarlet Runner Standard	Normal	3.5	
	Reversed	6.4	1.8

REVERSED BEAN VINES

by Grote Reber*

Research Corporation, New York City

During the summer of 1959 experiments¹ on mechanically reversing the direction of twining were conducted at Green Bank, West Virginia, U.S.A. Similar experiments were conducted during summer of 1961-2 at Hobart, Tasmania, Australia. *Two types* ~~Three~~ rows of plants were used. They all turned naturally counterclockwise like a righthand screw thread, the same as at Green Bank. ~~The seeds of the rows were from Green Bank.~~ Row A used standard seed from normal Hawaiian vines. Row B ~~used inverted color, or black seed from both normal and reversed Hawaiian vines.~~ Row *B* used Tasmanian seed locally known as Scarlet Runner. This plant seems closely related to the Lima. Seed comes in a wide variation of color combinations. The particular seed chosen was *cream* tan with fine irregular *brown* markings, quite similar, except in size, to standard Hawaiian seed. These vines had red and white flowers. ~~All were manipulated as previously described.~~ *The vines --- Castanea --- full growth.*

Row A performed well in that the plants grew to full size, matured, withered and dried. Row B ~~was in a somewhat poorer location. Also black seed seems to produce less vigorous plants, so these vines did not grow as high as normal.~~ Row *B* produced very tall plants with luxuriant foliage. However the season was too short for this variety to complete a life cycle as some immature green pods remained at top of vines when frost came. ¹ These were included with vines and deleted from study. Only fully dried pods with mature beans were included in the analysis. *This plant is a perennial in warm climates. The field data --- weight of vines of*

The plants were divided into levels: Up to 1 foot, 1 to 4 feet, Over 4 feet. Pods having stem fastening to vine within these levels were harvested separately. If less than four pods were in a level, these were included in a lower level. The field data was analysed on a basis of equal importance for each pole position as shown in table I.

~~and on a basis of combined data for each level. The results are slightly different, as shown in the table, but lead to the same conclusions. The reversed vines ^{of both rows varieties} grown from standard seed have a higher ratio of (weight of beans)/(weight of shucks), especially at the top. ~~The vines grown from black seed exhibit the same phenomenon up to the 100-foot level. At higher levels, reversing the vines causes the ratio to decrease. The matter is being looked into under more suspicious circumstances this season.~~ It seems the phenomenon appears properly only on a sufficiently large sample of full size vigorous plants which complete a life cycle. A Data for row~~

A are plotted in the figure. ~~All three groups produced more inverted~~
~~In common with previous experiment; no visible change occurred~~
~~color or black beans on the reversed vines.~~
in the ratio ~~Beans/Pod~~, Beans/Pod, Beans/Gram. However the
(1. "Reversed Bean Vines", Grote Rober, Castanea, Vol25, Dec.1960, p122-4.)

(* c/o C.S.I.R.O., Stowell Ave., Hobart, Tasmania.
ratio Grams/Pod was four to eight percent less on the reversed vines. This confirms that pods on reversed vines have lighter and probably thinner shucks.)

Ratios of REVERSED VINES / NORMAL VINES

SEED	Level	Twining Nor. Rev. Positions		Equal Importance for Each Pole Position				Trials for One Chance Occurrence	Combined Data for Each Level			
				<u>Grams</u> Pod	<u>Beans</u> Pod	<u>Beans</u> Gram	<u>Wt. Beans</u> Wt. Shocks		<u>Grams</u> Pod	<u>Beans</u> Pod	<u>Beans</u> Gram	<u>Wt. Beans</u> Wt. Shocks
Hawaiian Standard	Over 4 ft.	9	12	.92	.98	.92	1.43	100-2000	.93	.98	.93	1.39
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	Entire Pole	15	12	1.00	.97	1.06	1.10	5	.89	.98	1.07	1.05

		ENTIRE GROUP	
Twining		Percent Black Beans	<u>Reversed</u> Normal
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	Reversed	3.0	
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	Reversed	4.1	
Scarlet Runner Standard	Normal	3.5	1.8
	Reversed	6.4	