

22nd September 59

Talked to Dr. Richard Klein at the Research Dept of Botanical Gardens, New York City. He had never heard of an experiment like mine on the bean vines. He looked at graphs and data. They appeared fairly good to him. He suggested that I compute the standard error for all the results. If the difference between the averages on normal and reversed vines is two or more times the sum of the standard errors, then the results are considered significant. He also suggested a search of the literature, particularly the Bibliography of Agriculture under titles of Circination, Twining and Thigmotropism. If nothing like my experiment could be found, and provided some of the results were significant; then I should write something up to be published. He voluntarily mentioned that Kenneth Thiemann at Harvard was one of the best men in country on beans and vines. Klein suggested that I read these books "Bioelectric Fields and Growth" by E. S. Lund, University of Texas Press, 1947  
"Statistical Methods Applied to Experiments in Agriculture", George Waddel Snedecor, Iowa State College Press, 1946 4th edition.

I went to NYC library and examined the  
"Bibliography of Agriculture", Volumes 1 through 12,  
1942 through 1948.

"Agricultural Index", all volumes from start of  
Vol 1 in 1916 through most recent volume of May 1959

The titles turned out to be under Climbing Plants  
and under Vines. There are hundreds of articles  
about how to beautify your garden, perhaps 95%  
a few are descriptive of particular vines in a  
botanical way. Only three articles of experimental  
nature could be found. These are by H. V. Hendricks  
Results are on attached sheet.

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"Torsion Studies in Twining Plants",  
H.V. Hendricks, Botanical Gazette, Vol 68, pp  
pp 425-490, Dec. 1919, Ag. Index 1919-1921, Vol 2

also Vol 75, pp 282-297, May 1923, Ag. Index Vol 3

These are measures of increase of axial twist and rigidity  
as vine grows older. No attempt to influence growth. Done  
at Traverse City, Michigan.

(abstract of article in Nature Magazine (Washington))

"Plants that Twist", Lit. Digest, Vol 78, p 25-26  
Aug 18, 1923, Ag Index 3. Purely descriptive.

Purely descriptive of cells etc. No attempt to measure or influence growth.

"Physiological Anatomy of the Irrelevant Organs of  
some Climbing Plants, P.M. Kanga & R.H. Dastur.  
Ann. Bot. Vol 41, p 671-5, Oct 1927, Ag Index 5

"Anatomy of Climbing Plants", R.H. Dastur & G.A.  
Kapadia, Ind. Bot. Soc. Vol 10, p 110-21, April 1931  
Detailed descriptive material Ag Index 6

"Movements and Habits of Climbing Plants", C.R. Darwin  
1937 cheap edition, John Murray, London, Ag Index 8

"Klinostat-studies in twining vines", H.V. Hendricks,  
Am. Ind. Botany, Vol 27, p 195-8, March 1940, Ag. Index 7  
Twining reduced when vine trained on nearly horizontal axis; <sup>Dist. rev = 3 1/2 in.</sup> <sub>opposite to normal</sub> <sup>twining</sup>

"What do you know about vines?", Horticulture, Vol 17,  
p. 334, Aug 1, 1934, Ag Index 9  
Just a query table on nomenclature. Not even descriptive

American Journal of Botany \$1.35 per copy

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want March 1940  
Vol 27, No 3

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