Don't plant white pine near Walnut!

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It has long been known that black walnut *(Juglans nigra L.)* trees can adversely affect the growth of nearby plants of various species, and this problem has been studied extensively in West Virginia by Brooks.[2] But, it is hard to quantitatively evaluate the phenomenon. The authors have tried to do so and their findings are described in this article.

Eastern white pine *(Pinus strobus* L.) seedlings (2-0 stock) were planted on the West Virginia University Forest in 1962 in a degenerated black walnut plantation which was established on a badly eroded old field by the Civilian Conservation Corps in 1940. After 11 years, obvious differences in growth of the white pine, averaging 12.5 feet in height, were apparent, although the stunted walnuts, averaging 6.5 feet in height, did not shade the pines to any extent.

To evaluate the influence of the walnuts on the growth of the pines, the distances between each of 362 white pine stems and the nearest walnut stem- averaging 8.7 feet-and between their crowns were determined. Also, the total heights and crown diameters of the pines and walnuts were recorded.

2 Brooks. M. C. 1951. Effect of black walnut trees and their products on other vegetation. WVU Agr. Expt. Sta. But. 347. 31 pp.

Relative sizes of pines and walnuts were quantified by the product of the square of their crown diameter times total tree height, comparable to the dbh^2-height variable used often in mensurational studies. Multiple regression and correlation analyses were used to analyze the data.

As can be seen in tables 1 and 2, the larger the walnuts and the closer to the pines, the smaller the pines. When walnut size was not related to distance from the pines, no significant relations were detected. Although not of practical value, a multiple regression utilizing all the walnut variables given in table 1 explains 84 percent of the variation found in both height and size of pines.

The conclusion to be drawn is obvious. White pines should *not* be planted near black walnut trees. Perhaps, as roughly indicated in table 2. a guide might be to plant white pines no closer to walnut trees then the anticipated total height of those walnuts.

TABLE 1.—Correlation coefficients (r) between pine and walnut variables

Walnut variable	Pine height	Pine size
H/D	-0.19**	-0.18**
R/D	-0.18**	-0.17**
C²H/D	-0.15**	-0.13**
d	-0.04 ns	-0.05 ns
C²H	-0.05 ns	-0.07 ns
H	-0.01 ns	-0.05 ns
D	0.01 ns	0.01 ns
R	-0.01 ns	-0.05 ns

Symbols used:

- ** = significance at the 1 percent level of probability
- ns = not significant
- H = total height (ft.)
- D = distance between pine and walnut stems (ft.)
- R = crown radius (ft.)
- C = crown diameter (ft.)
- d = distance between pine and walnut crowns (ft.)

TABLE 2.—Height of white pine (feet) in relation to the height of and distance to the nearest walnut.[1]

Distance to walnut (feet)	Height of walnut (feet)					
	2	6	10	14	18	22
2	13	11	10	8	6	5
6	13	13	12	12	11	11
10	14	13	13	13	12	12
14	14	13	13	13	13	12
18	14	13	13	13	13	13

[1] From the relation, pine height = 13.6965 - (0.8265) (H/D), which, although significant at beyond the 1 percent level of probability, accounted for only 4 percent of the variation in heights of pines.