in which Y is the yield when x units (of 24 pounds each) of P_2O_5 are applied per acre, M is the maximum toward which the yield increases as x increases indefinitely, A is the difference between M and the yield for $x=0$, and R is the ratio of the decreasing geometric series of which the terms are the increments of Y corresponding to successive unit increases in x.

From applications of 24 to 96 pounds of P_2O_5, the agreement between actual and expected yields is excellent. But in each case the yield for $x=0$ lies considerably above the curve. The facts are explained if we assume that, of the phosphates applied, 6.91 pounds per acre are absorbed by the soil and held in a condition unavailable to oats, the corresponding figure for corn being 7.55 pounds and for wheat 10.87 pounds.

In previous work I have found that corn can obtain considerably more phosphate from a given soil than can wheat.

If the above assumptions are correct, oats should have yielded the same for any application of P_2O_5 between 0 and 6.91 pounds; corn for applications between 0 and 7.55 pounds, and wheat between 0 and 10.87 pounds. The validity of this assumption could easily be tested by a series of applications such as 0, 2, 4, 6, 8 and 10 pounds in addition to the application actually used in these experiments. A number of replications would be necessary to insure accuracy in the yields obtained.

The method of determining the values 6.91, 7.55 and 10.87 is simple. It is merely to find the point on the respective curves at which the value of Y in equation (1) above is the same as the observed yield at $x=0$. The values of the constants in equation (1) were determined by the method of least squares from the yields at $x=1$, 2, 3, and 4 units of 24 pounds P_2O_5 each.

Niklas and Miller, in an article[1] dealing with the form of the yield curve, assemble nine series of experiments with nitrogenous fertilizers, in all of which the phenomenon of nitrogen absorption is plainly evident. I have taken the trouble to recalculate the constants in the yield equation for each of these nine series, first with the yield at $x=0$ included, second, with this yield omitted. In each case the curve calculated without the yield at $x=0$ fits the observed yields better than that calculated with Y_0 included. This indicates that some nitrogen is actually absorbed in each series of experiments. Evidence of nitrogen absorption also appears in some field experiments in this country, particularly on delta soils in Mississippi.

In view of this situation it is obvious that in accurate experimental work with fertilizers the check plots should not be left unfertilized; they should receive an application of fertilizer at least as large as the quantity the soil is capable of absorbing and holding in a condition unavailable to the growing crop.

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[1] H. Niklas and M. Miller, "Beiträge zur Mathematischen Formulierung des Ertraggesetzes," *Zeitsch. f. Pfl.-ernahr., Düng. u. Bodenkunde*, Teil A, 8 Band, Heft 5., S. 289–297.

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