THE UNAVAILABILITY OF PHOSPHORUS IN ROCK PHOS-
PHATE TO SOME SOUTHERN CROPS1

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The small amount of total and available phosphorus in many
southern soils makes the question of phosphatic fertilization very
important from the standpoint of economic crop production.

Of the several kinds of phosphatic compounds sold as fertilizers,
superphosphate (acid phosphate) and rock phosphate are the two
which can be more readily obtained. The phosphorus can be bought
much more cheaply per unit as rock phosphate, and if it is just as
efficient as superphosphate (acid phosphate) in producing crops, it
would materially lower the cost of production of different crops.

This investigation was started in order to study the availability
of the phosphorus in rock phosphate as a source of phosphorus for some
crops commonly grown in southern states.

Considerable data have been reported regarding the availability
of phosphorus in rock phosphate as compared to superphosphate
(acid phosphate) for a large number of crops, and several theories
have been advanced to explain the variations found in the ability
of plants to utilize the phosphorus in rock phosphate. Chirikov (2, 3)3
concluded from the results of his experiments that plants having a
ratio of CaO to P2O5 greater than 3, could make good growth upon the
phosphorus in rock phosphate. Truog (8, 9) formulated a theory
that the calcium oxide content of a plant was the measure of the
ability of plants to utilize phosphorus in rock phosphate. Bauer (1)
suggests that other factors, among which is the type of root, may
determine, at least in part, the ability of plants to feed upon rock
phosphate.

Of the large number of investigations made with rock phosphate,
the work of Merrill (5, 6), Truog (9), and Bauer (1) give a good
index to the availability of phosphorus in rock phosphate for many
crops. Unfortunately, many of the important crops grown in the
southern part of the United States were not included in their experi-
ments. A summary of their results is given in Table 1.

The results on the whole agree very well, although in a few in-
stances, such as the corn and clover crops, there are considerable
differences reported in the ability of the crops to use the phosphorus
in rock phosphate.

1Contribution from the Department of Agronomy, Arkansas Agricultural
Experiment Station, Fayetteville, Ark. Published with the permission of the
Director as Research Paper No. 98, Journal Series, University of Arkansas.
Received for publication May 31, 1928.

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3Reference by number is to “Literature Cited,” p. 919.