IT SEEMS to be definitely established that plants take up most of their phosphate supply in the early stages of growth, and it is then that the application of phosphatic fertilizers to a soil needs thorough consideration.

Gregory (3), having worked with maize in sand culture, showed that the first application of phosphate was the most efficient. Later applications, although continuing to increase the rate of growth, tended to become much less effective. Gericke (2), after running a series of water culture experiments, believed that the maximum dry weight of wheat was obtainable when the plants were grown in nutrient solutions for four weeks and then transferred to solutions containing no phosphate. Brenchley (1), working with barley in water culture experiments, found that sufficient phosphate was taken up in the first six weeks to allow the plant to attain its maximum dry weight. The absence of phosphate in the early stages of growth, on the other hand, led to a rapid drop in the ultimate amount of phosphate taken up by the plant.

Owing to the presence of a minute quantity of available phosphorus in any infertile soil, the results obtained from soil cultures are generally regarded as more variable than results obtained from nutrient solutions where the supply of phosphate can be completely controlled in the early stages of growth. Knowles and Watkin (4), in a study of the assimilation of plant nutrients in wheat during growth, found that assimilation of phosphate ceased at two weeks before harvest. The experiment was conducted on a clayey calcareous soil.

The present report is an outgrowth of pot-culture experiments with wheat growing on a yellow earth deficient in phosphorus. Various quantities of phosphate fertilizer were added to the pots at different times. The concentration of phosphorus in the plant at different stages of growth was determined and the yield analyzed.

EXPERIMENTAL PROCEDURE

The soil selected for this experiment is known as Si-shan-ping clay loam, an old yellow earth located on a narrow horizontal depression on the top of an anticlinal ridge 80 kilos northwest of Chungking in Szechuan Province, China. As indicated by the following analysis, this soil contains very little available phosphorus:

<table>
<thead>
<tr>
<th>pH</th>
<th>Total P&lt;sub&gt;2&lt;/sub&gt;O&lt;sub&gt;5&lt;/sub&gt; %</th>
<th>Available P, p.p.m.</th>
<th>Neubauer value, P&lt;sub&gt;2&lt;/sub&gt;O&lt;sub&gt;5&lt;/sub&gt; mg</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.5</td>
<td>0.08</td>
<td>Trace</td>
<td>-1.95</td>
</tr>
</tbody>
</table>

1Contribution from the National Geological Survey of China, Division of Soils, Chungking, China. Published with the consent of the Director of the Survey. Received for publication July 19, 1940.
2Soil Chemist. The writer is indebted to Mr. Y. C. Shang for his help in determining phosphorus in plants during the growing stages.
3Figures in parenthesis refer to "Literature Cited", p. 788.