

A sampling survey of actual farmers' experiences with nitrogen fertilizer was conducted in 1958-59 by the Ministry of Food and Agriculture of the Government of Pakistan. Nearly 2,200 farmers in 15 Districts of West Pakistan were asked whether they used fertilizer, and, if so, what results they had obtained. In 5 Districts 3.5 percent or more of the farmers admitted to using fertilizer on wheat. In these Districts, 171 of the cultivators who were questioned had applied an average of 22.5 pounds of nitrogen per acre to their wheat crop. They believed that they had obtained, on the average, a yield increase of about 300 pounds, very close to the results observed by Drs. Wahhab and Vermaat with 30 pounds of nitrogen per acre.

Estimates of the response of wheat to fertilizer based on an earlier series of trials have also been published by Wahhab (1960). A somewhat lower estimate, which may be based on the same data, has been published by the Planning Commission of Pakistan (1959). All these sources agree that an increase in wheat yield of about 300 to 400 pounds per acre can be attained by applying moderate amounts of nitrogen. The data and estimates for wheat are summarized in Table 2.4 together with farm experience and estimates of increased yields from application of nitrogen on other important crops, published by the Planning Commission (1959), and by Wahhab (1960).

Except for rice, which requires ammonium nitrogen⁽¹⁾, all of the usual forms of commercial nitrogen can be utilized, but only soluble forms of phosphorus fertilizers, such as superphosphates, should be employed. The need for nitrogen fertilizers is greatest. Crops use large amounts of nitrogen, and, because it is a highly mobile nutrient, there is a minimum of carryover from one growing season to another. In contrast, phosphorus is retained by soil, and plants use smaller amounts. Relatively high initial applications of phosphorus fertilizer will be needed to overcome the inherent soil deficiency, but subsequent additions can be more modest. The phosphorus fertilizer should be applied to a highly responsive crop in the rotation, such as wheat or legumes.

On the average, at least 30 pounds of elemental nitrogen per acre per crop could be profitably used at the present time. On land that has not

(1) Urea can be used on rice, because it behaves in solution like ammonia.