

We have not been able to obtain data on the response of crops other than wheat to phosphate. Estimated responses of other crops to nitrogen have been published by the Planning Commission of Pakistan. We have used these data to prepare Table 5.9, which shows the increases in yield that might be expected from the application of 249 million pounds (124,000 short tons) of nitrogen to selected crops in five canal-irrigated Districts of the Punjab. These Districts, containing about nine million sown acres, are Lyallpur, Shahpur, Lahore, Montgomery, and Multan. The acreage sown to different crops and the prices assumed in Table 5.9 are the average for the decade 1949-50 to 1958-59. In our calculations, we have assumed that nitrogen is applied only to those crops in which a marked net increase in value can be obtained. For rice, wheat, maize, fodder, and tobacco, we have taken 30 pounds of nitrogen per acre. For fruits, vegetables, and cotton, we have assumed 45 pounds per acre, and for cane sugar, 60 pounds.

The average application over the total sown area, including crops assumed not to be fertilized, such as gram, oil seeds, barley, and millets, is slightly less than 28 pounds to the acre. Except for tobacco, which is a relatively minor crop, by far the highest net increase in value, Rs 171 to the acre, is obtained from sugar. The increase in yield of raw sugar (gur) is nearly a thousand pounds per acre. Fruits and vegetables show similar increases in yield, but smaller net increases in value. The increase in yield for maize is about half that for sugar, and the net increase in value about a third. For the entire sown area in these Districts, the computed increase in yield, not counting fodder crops, is over 800,000 tons, close to 27 percent of the average yield without fertilizer, and the net increase in value is over Rs 225 million, or 17 percent.

Although this computed average increase in yield is quite impressive from an over-all point of view, the experience of the individual farmer may not be very effective in convincing him of the value of using fertilizers. Depending on weather and other circumstances, the yield per acre on small plots without fertilizer can vary from year to year by much more than 20 percent. Moreover, in the 610 trials conducted by Wahhab, there was a considerable variability from one plot to another, even with supposedly identical amounts of fertilizer and water.

Gross benefit-to-cost ratios from fertilizer use vary directly with crop prices received by the farmers, as well as inversely with fertilizer costs. Crop prices