

FERTILIZATION OF CORN

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Silage production from corn is a function of many inputs, including the total fertility program. For the most part, in this area, corn is grown in a monoculture, year after year, without alternating with other crops. Fertility programs are based uniquely, then, on maintaining or increasing production with manure or fertilizer or a combination of manure and fertilizer.

We observe many times both over-fertilization and under-fertilization, depending on distance from the barns and the manure applied to the specific fields. Often, fields near the barns receive much of the farm manure and need no additional fertilizer. Fields, often rented, that are distant from the barns receive only commercial fertilizer. The tendency, then, is for near fields to receive more than they need to grow the corn crop while far fields receive less than they need to grow the maximum economical yield.

If we drop the use of all manure and fertilizer on the near fields that have been previously heavily manured, we find in the first year an approximate yield loss of about 10%. If manure or fertilizer are applied, however, yields can be maintained at the highest levels that the year's weather permits.

If we use no manure or fertilizer on the far fields that depend solely on commercial fertilizers for production, the yield decline is strong. We have measured this decline at 40-50% in field after field. Ideally, we would like to see these far fields manured occasionally. Yet we recognize the economics of moving manure does not permit transport over long distances.

Yield goals, then, should be established for the several fields on the farm that are used for corn production. Then, inputs of manure and fertilizer can be budgeted to produce the target yields. Depending on weather, the target yields should be achieved.

We suggest 8½ lb of nitrogen for each ton of corn yield goal level. Phosphate and potash are applied according to soil test levels of phosphorus and potassium. Under high fertility buildup, we may suggest only nitrogen be applied for the current year's crop. We believe soil pH should be in the 6.5 to 7.0 range to maximize production and make most efficient use of fertilizer additions.

We have some evidence that the highest yield levels of corn in monoculture can be attained with 28 tons free-stall manure plowed down within a day after being spread. The longer the manure weathers after being applied, the less its value and likely 35-40 tons would be required to achieve the highest yield levels. P and K levels in the soil will build with either manuring regime.

With commercial fertilizers alone, since fertilization is aimed for current year's production, buildup of P and K will be slow or does not occur. Nitrogen must be applied at current high rates to achieve economical and high yields.