Fertilization of Celery

adequate supply of nitrogen required for best yields

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Proper fertilization is more essential for celery than for any other vegetable crop grown in California, and no other vegetable crop gives as large returns on the investment in fertilizer.

Today California grows about one third of the United States celery crop. The 1947 crop was produced on slightly over 14,000 acres, with an average farm value of $1,763 per acre. Production costs are correspondingly high and may run up to $1,200 per acre in the intensive production areas of Los Angeles to considerably less than that in the Delta area of central California, where somewhat less intensive methods are practiced. With production costs and potential returns on such high levels the importance of selecting the proper fertilizer program is readily understood.

Tests Made

During the past several years, numerous experiments have been conducted by the University of California which, on mineral soils, showed profitable increases from application of nitrogen up to 400 pounds per acre. This was true in some cases even when 10 tons or more of chicken manure has been applied to the soil just before the celery was planted.

When all of the nitrogen was derived from inorganic sources, the yields were as good as when part of it was derived from natural organics, such as dried blood.

On organic soils which are richer in nitrogen and where the cropping is less intensive, a satisfactory crop is sometimes produced without any nitrogen.

Two hundred pounds of nitrogen per acre appear to be adequate on all organic soils.

As a rule, celery plants produced on unfertilized plots were short, small, tough, yellowish in color, very astringent in flavor, and generally unmarketable. In some tests the poor flavor and color of the celery produced on the unfertilized plots rendered it worthless for marketing even though the total growth was not seriously affected. Plants receiving nitrogen practically always reach a marketable size in shorter time than those not receiving nitrogen.

Nitrogen Supplied

An example of the effect of fertilizer on California-grown celery was observed in an experiment in the Los Angeles area in 1946 where plants grown on plots lacking nitrogen produced 904 crates per acre as compared with 1,442 and 1,613 crates on plots receiving 200 and 400 pounds of nitrogen per acre, respectively.

In the Terra Bella area of central California, also on a mineral soil, when nitrogen was withheld no marketable plants were produced while on plots receiving 100, 200, and 400 pounds of nitrogen per acre the yields were 1,438, 1,775, and 2,021 crates per acre, respectively.

In a test on winter celery in the Chula Vista area, unfertilized plots produced no marketable plants. Those receiving 200 and 400 pounds of nitrogen per acre yielded 1,558 and 1,665 crates per acre, respectively.

On a peat soil of the Delta area, the yield on unfertilized plots was 262 crates per acre. Adding 200 pounds of nitrogen per acre increased the yield to 305 crates.

Timing Important

Time of application is very important. At least part of the fertilizer should be put on at the time of transplanting. When high rates of nitrogen are used it is desirable to split the application and put part of the fertilizer on at the time of transplanting and the remainder about midway in growth. This is illustrated by results from a test on a mineral soil. When all of the fertilizer was put on at time of planting the yield was 952 crates per acre as compared to 1,081 when the application was divided.

Late Application

It is very doubtful if late fertilizer applications are of benefit. As good celery has been produced when the last application of fertilizer was made six weeks previous to harvest as when applications in the irrigation water were made right up to the time of harvest.

Late applications probably have little beneficial effect other than giving a better color.

Even though celery gives large responses with very heavy rates of nitrogen fertilizer, it may be a relatively inefficient user of the nitrogen applied.

Intensive Cultivation

In the Los Angeles area where celery is grown under very intensive cultivation, the growth of plants fertilized with 400 pounds of nitrogen per acre has amounted to over 70 tons of fresh material per acre. These same plants removed from the soil 235 pounds of nitrogen per acre, 49 pounds of phosphoric acid, and 692 pounds of potash. This may be contrasted with plants grown on plots not receiving nitrogen which removed 112 pounds of nitrogen from the soil. Thus, of the 400 pounds of nitrogen applied the plants recovered only 123 pounds or less than one third of the nitrogen supplied.

The inefficiency in recovery is probably the result of several factors.

First, the crop has a very shallow root system and the feeding area is restricted.

Second, the crop grows very rapidly. In some tests over half of the total growth has been found to occur between 60 and 90 days after transplanting.

Third, the crop is irrigated heavily which undoubtedly results in some leaching of nitrogen.

Illustrating the effect of fertilizer on celery: *Left*, no nitrogen applied; *Center*, 200 lbs. of nitrogen per acre, as ammonium sulfate; *Right*, 400 lbs. of nitrogen per acre as ammonium sulfate.

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