

Test results reported here indicate that deep, permeable, medium-textured soils can be expected to outyield soils of heavy texture or of restricted depth. Also, heavy-textured, basin clay soils can be expected to outyield restricted-depth, claypan soils. The Olcott soil series appears poorly suited to sugar beet production.

SUGAR BEET PERFORMANCE AS RELATED TO SOIL SERIES, TYPE AND GRADE

Year	Zamora clay loam grade 1	Yolo silty clay loam grade 1	Capay silty clay loam grade 3	Capay clay grade 4	Olcott fine sandy loam grade 3
ROOT YIELDS IN TONS PER ACRE					
1963	22.3	19.1	19.1	15.5	12.5
1964	25.4	24.0	21.9	19.6	15.6
Two-year average*	24.1	21.4	21.0	17.9	14.5
PERCENT SUCROSE					
1963	15.1	14.7	16.1	16.2	17.3
1964	15.1	15.2	15.6	15.8	15.9
Two-year average*	15.1	14.9	15.7	16.0	16.3

LSD, 5% for differences among two-year averages: Root yield—2.6 tons per acre.

* Two-year averages computed from actual acres and tons of roots for both years for root yield and actual tons of roots and cwts. of sugar for both years for sucrose percent.

Sugar beet yield variation with soil type in Solano County

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PRIOR TO 1960, sugar beets in the Dixon area of Solano County were largely confined to recent, deep, grade 1 and 2 alluvial fan "ridge" soils of the Yolo and Zamora soil series. After 1960, sugar beet acreage was expanded to include grade 3 and 4 terrace claypan and basin clay soils of the Olcott and Capay soil series. This expansion resulted from the removal of government acreage allotment restrictions, the availability of nematode-free "virgin" land in the Solano Irrigation District, and the need to rotate old clay irrigated pasture land. No information was available to estimate potential sugar beet production on the new soils and little factual information was developed after using the soils for several years. This study was conducted to determine how well sugar beet yields correlated with soil type and grade, in the 1963 and 1964 crop years.

Dixon area

The study was confined to an area approximately 14 miles square, with the town of Dixon located 1½ miles north of the center. The area is in one climate zone and management practices are similar throughout. Nearly all the beets were planted in the spring, wintered-over in the ground and dug the following spring.

Information on field size and yield was taken from records of the local ASCS office. The soil types were determined by relocating each field on the soil map of the area. Percentages of each soil type in each field were determined by means of an overlay grid-count system.

Soil type

The study was confined to fields composed of at least 60% one soil type. Fields with less than 60% one soil type were not included. Comparisons were possible between Yolo silty clay loam, Zamora clay loam, Capay silty clay loam, Olcott fine sandy loam and Capay clay.

The grade 1 Yolo and Zamora soils occupy the "Dixon Ridge," a recent alluvial fan. The Capay silty clay loam soils occupy intermediate positions between the ridge and lower-lying basin soils. The Olcott soils occupy old, low terrace positions and have thick restrictive claypans. These pans occur approximately 18 inches below the soil surface in undisturbed soil. The Capay clay soils occupy low-lying, flat basin positions and are heavy-textured clay from the surface on down. All the last three soils fall into grades 3 and 4.

Production averages in tons of roots per acre, and per cent sucrose, were com-

puted for each soil type for each of the two years, and for the combined two-year period. The data were statistically analyzed to determine how well soil type and grade related to sugar beet crop performance.

Highly significant differences were found to exist between root yield and soil type. Thirty-nine fields of Zamora clay loam, totaling 3,103 acres, produced a two-year average of 24.1 tons of roots per acre. As shown in the table, the next highest yield was 21.4 tons per acre for the other "ridge" soil, Yolo silty clay loam, representing 57 fields containing 3,816 acres. The intermediate soil, Capay silty clay loam, averaged 21.0 tons per acre from 34 fields in 3,199 acres. The basin Capay clay soil produced 17.9 tons per acre in 31 fields containing 2,927 acres. The lowest yielding soil type was the Olcott fine sandy loam claypan soil which averaged 14.5 tons per acre in 27 fields totaling 2,703 acres.

Data in the table also show differences in sucrose percent were not as consistent as the differences in tons of root production per acre. However, there was a tendency for sucrose percentage to rise with a corresponding drop in root yield.

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