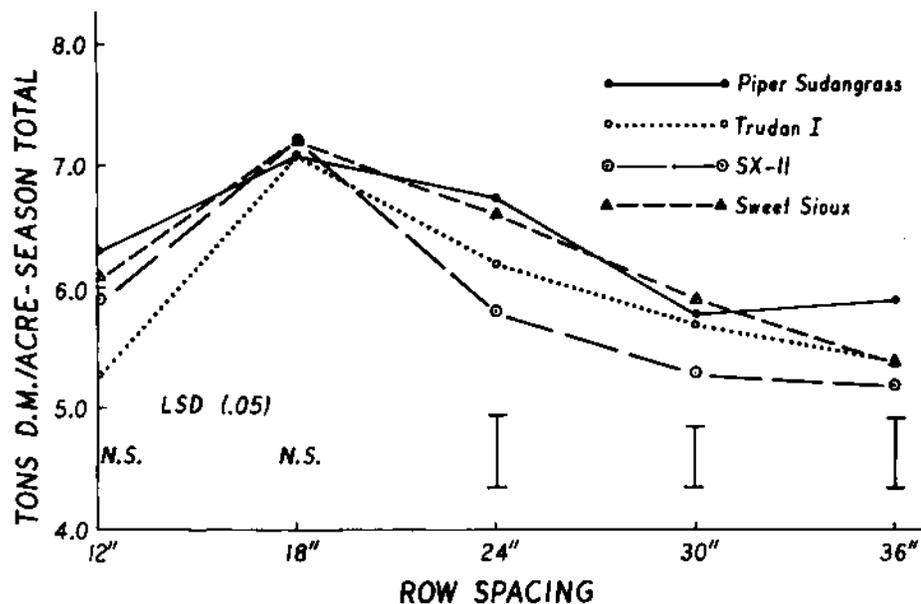


In summary, algae contain about the same level of crude protein as other protein supplements, such as cottonseed meal, and the protein quality is similar to that of meat and bone meal when added to a barley ration. However, the protein digestibility is lower than other common protein supplements, and this fact should be considered when balancing rations. The energy content of algae is low because of the decreased digestibility of the dry matter and because of the high ash content. However, only low levels of algae are needed to increase the protein level of the barley ration and would not greatly dilute the energy content of the ration.

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GRAPH 1, Variety response to row width when used as summer irrigated pasture.

## Row Width Effects on Pasture Yields of Irrigated Sudangrass and Hybrid Cultivars

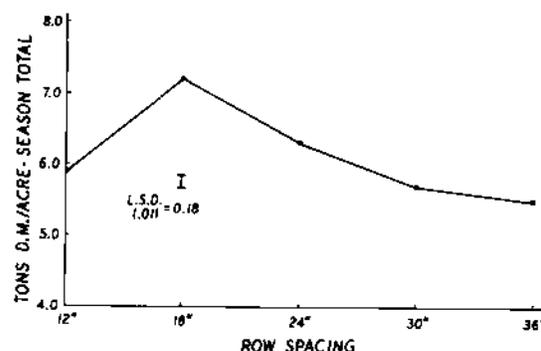
D. C. SUMNER

**E**STABLISHING AN ANNUAL irrigated pasture costs about the same as one based on perennial species. Therefore, every management opportunity should be taken to obtain maximum economical yields from the annual type, commensurate with the feed quality desired. One factor often overlooked by annual summer pasture operators that can favorably influence yield, is row spacing. It has been demonstrated many times that sudangrass stands are more productive when drilled than when broadcast. From experiments conducted under nonirrigated conditions in Illinois, it was determined that there was no significant difference in dry matter production of Piper sudangrass from row widths of 4, 8, and 16 inches. These trials were not harvested in the vegetative stage of growth as pasture but in the early bloom stage, nearing maturity.

Trials conducted by the University of California Extension Service in Alameda County in 1959 demonstrated that when Sudan 23 was harvested in the later stages of growth, there was essentially no difference in yield between 6-, 12-, 18-, or 24-inch rows. In 1960, using the same row spacings but harvesting at a much earlier stage of growth, Sudan 23 was most productive at the 18-inch row spacing.

During 1964, tests were conducted at the University of California at Davis to determine the effect row spacing may have upon pasture yields. A split-plot experimental design with five replications was used. Row spacings of 12, 18, 24, 30, and 36 inches were used as the main plots and four varieties were used as the subplots. The response to these row-spacings of Piper sudangrass, Trudan I (a sudangrass hybrid), SX-11 (a grain sorghum hybrid  $\times$  sudangrass), and Sweet Sioux (a sorgho hybrid  $\times$  sudangrass) were compared. The plots were seeded May 13 with seeding rates adjusted to give approximately 15 viable seeds per foot of row for all varieties. Fifty pounds of nitrogen was applied preplant and after each harvest, at which times the plots were irrigated. Four harvests were made during the season, based upon the growth of Piper sudangrass, and ranged nearly 30 inches in height—except for one harvest date when Piper reached nearly 45 inches before harvest. These stand heights are within the normal range for use as pasture.

The effects which row spacing had upon dry matter yield of irrigated sudangrass, and the hybrid types tested, when used as pasture, are illustrated in graph 1. The results suggest that production from



GRAPH 2, Yield response to row widths. Mean of the seasonal yields of Piper, Trudan I, SX-11 and Sweet Sioux when used as summer irrigated pasture.

sudangrass pastures can be increased by more than 20% when row widths are changed from 12 to 18 inches. Row widths greater than 18 inches resulted in lowered yields. Graph 2 illustrates the response to row spacing of different varieties. It appears that 18-inch rows of varieties tested are more conducive to producing maximum pasture yields than the other row spacings tested. There is evidence to support a contention that as sudangrass and the hybrid cultivars approach the late greenchop, hay, or silage stages of development, row spacing may have little or no effect upon dry matter yield. However, when weeds are a problem it must not be overlooked that closer row spacings, or a broadcast seeding, may be more desirable.

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