Water Consumption by Pompon Chrysanthemums

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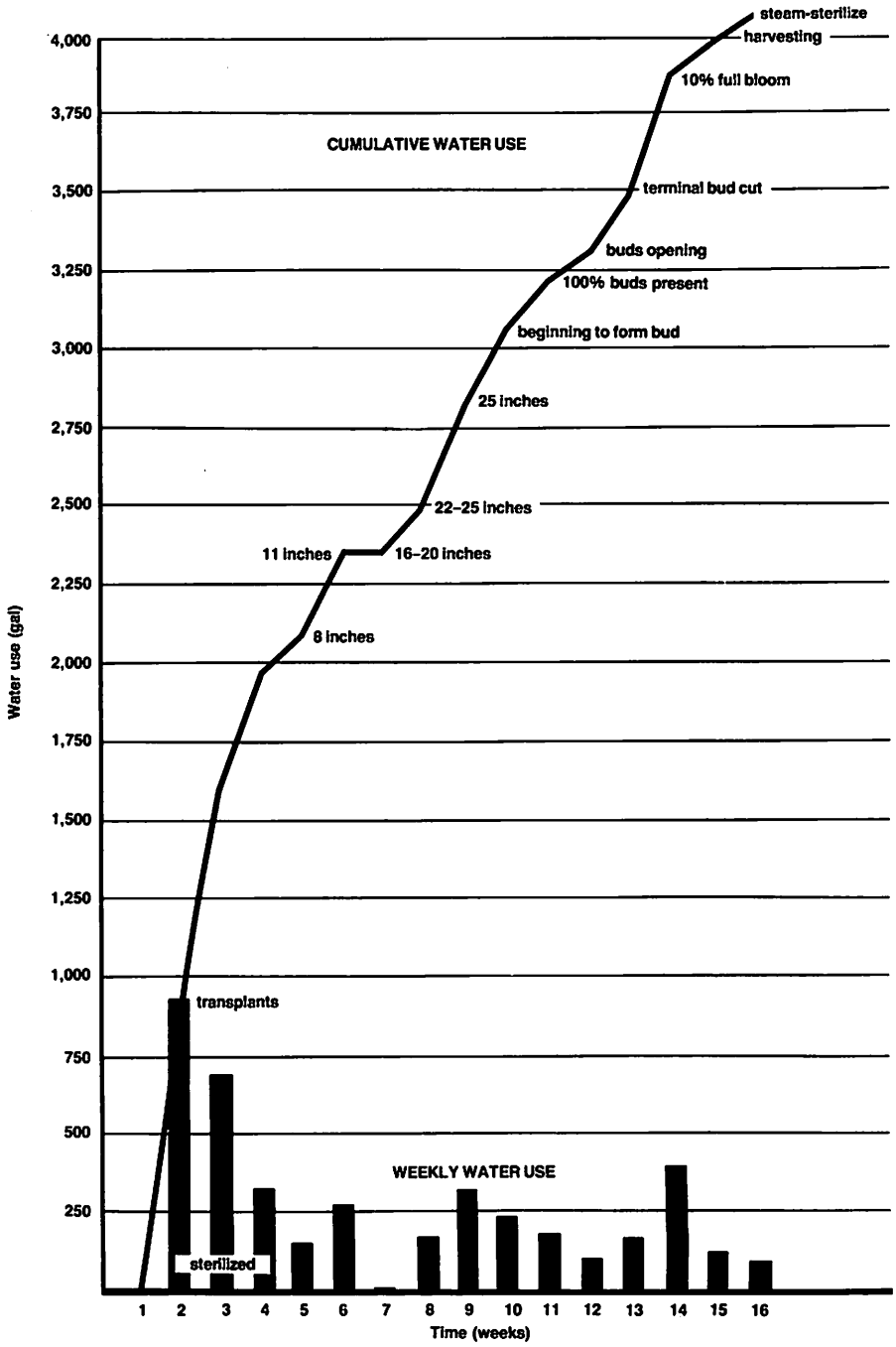
Many greenhouse growers around Carpinteria, south of Santa Barbara, are faced with the need to conserve water. The California South Coast is a water-deficit area, and to meet the demand, water must be imported. Water needs of cut chrysanthemums are maximized, because they are an intensive crop grown under controlled conditions. The problem is applying adequate water to maintain quality where the water supply is limited.

Greenhouse growers in general probably use more water than necessary to leach out any salt buildup in the soil. A trial was conducted on pompon chrysanthemums in the Dutch Brothers Greenhouses, Carpinteria, to measure the water used by this crop throughout the year.

Procedure

In the trial, water meters were placed on five beds throughout the greenhouse, and weekly readings were taken during 1979. The trial was simply to determine the actual water use under normal growing conditions; therefore, no change was made in either quantity or timing of the water applied.

Greenhouse bed sizes averaged 160 feet in length and 2.5 feet in width. The entire greenhouse area was 3.8 acres, of which 2.2 acres or 58 percent was the actual growing area within each bed. The remaining 1.6 acres or 42 percent consisted of aisle space between the beds and the center walkway. Irrigation was by water lines laid lengthwise down both sides of the bed with nozzles spaced an average of 24 inches apart throwing a flat spray of water in a half circle pattern. Overlapping of the sprays permitted uniform wetting. Total area used within the trial was approximately 2,000 square feet.



Typical chrysanthemum watering schedule for 16-week spring growing cycle, Dutch Brothers water use trial, January 9 to April 24, 1979. Data obtained from bed 163.5 by 2.5 feet. Total water use: 4,086 gallons, equivalent to 4.3 acre-feet per acre per year.

Water figures per acre in the test were calculated using both the actual growing or rooting area of 2.2 acres and the entire greenhouse area of 3.8 acres.

Results

Water use for 1979, using the entire greenhouse of 3.8 acres, was 3.03 acre-feet per acre. Water consumption on just the test beds resulted in an average of 5.76 acre-feet per acre of actual rooting area.

The graph illustrates a typical watering schedule for a 16-week spring growing cycle. Over 40 percent of the total amount of water for the cycle was used within the first 2 weeks. On the average, most growing cycles tested used between 30 and 40 percent of total consumption during the first 2 weeks with gradual lower weekly increments following.

With such a high early growing consumption, one might assume that excessive amounts of water are being used at the start of the growing cycle. Leaching and perhaps frequent watering to lessen the shock of transplanting the cuttings are possible explanations. However, when water consumption is calculated on the more common basis of the entire greenhouse area, the amounts are substantially reduced.

The average annual figure previously mentioned of 5.76 acre-feet per acre then becomes only 3.03 acre-feet per acre, when one considers that the actual volume of water was used on only 58 percent of the entire greenhouse area. The 3.03 acre-feet per acre then becomes a much more acceptable figure and is considered to be minimum for pompon mum production.

Conclusions

Water savings are conceivably possible with a reduction in water applied the first 2 weeks of the growing cycle. A followup trial is being considered to monitor salt levels at various leaching rates to determine if adequate leaching can be accomplished with less water. Nitrite levels will be analyzed to see if toxic amounts accumulate after steam sterilizing the bed.

A previous University of California study conducted on potted chrysanthemums in San Mateo County showed that water savings were achieved without affecting quality by reducing the amount of leaching. A side benefit of this study was the possibility of using less fertilizer as a result of less leaching.

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