that pasture subdivision can be one of the least expensive range improvements.

Fence material costs in 1983-84 were $400 per mile compared with $2,000 for traditional barbed wire fences (table 5). That converts to less than $5 per acre, which is substantially less than the establishment cost of an annual legume seeding or range fertilization. For $5 per acre, a 50% to 100% increase in beef production was accomplished. A legume seeding yielding 50% to 100% increases in beef production would cost about $50 per acre (table 6). Fifty pounds per acre of nitrogen will frequently double production for 1 to 2 years at about $15 to $30 per acre.

Management problems

Controlled grazing is not without problems. More labor was needed because of the frequent rotation of stocker cattle to new paddocks. The large pasture size and short time the cattle were on the ranch may have affected labor requirements. On other ranches using smaller paddocks for controlled grazing, stockers have been moved very quickly. Ease of movement from paddock to paddock contributes to ranch operational efficiency, as indicated by reduced labor and lower animal stress. Ranch landscape, layout, accessibility, and stock-water availability are important factors affecting the efficiency of cattle movement from paddock to paddock.

Trampling reduced plant cover during the wet season on heavy clay soils. It's amazing how much damage 720 head of 700-pound steers can cause just by being moved. The narrow portions of the pie-shaped paddocks were heavily affected by the concentrated trampling that occurred each year. This problem may be difficult to avoid in cell arrangements with a central watering facility. The second cell on the O'Connell Ranch did not have the same problem, because of its block arrangement with water in each paddock. Placement of stock water in each paddock is preferable, if sufficient water is available and facilities can be developed economically. Pie-shaped paddocks with a single central watering facility should not be overlooked, however, because they remain a powerful tool for achieving pasture rest between successive grazings.

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Treated tomato transplants (right) were significantly shorter than untreated plants.

Growth regulator controls tomato transplant height

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A new plant growth regulator, uniconazole, controlled height of greenhouse-grown fresh market tomato transplants in a 1-year trial. Field results showed no effect on final yields and quality.

Delays in planting can result in overgrown, difficult-to-handle transplants. As is true of ornamental plants grown in greenhouses, increased shelf life for vegetable transplants is an important goal for producers, particularly when plants must be held in the greenhouse for a longer than optimal period.

A growth regulator, uniconazole (Sumagic) has been shown in a study by the senior author to be an effective plant height inhibitor for many species of greenhouse-grown ornamental plants (*Flower & Nursery Report*, Spring 1988). Another potential use for this chemical is in vegetable transplants grown in the greenhouse. We conducted trials to evaluate uniconazole on fresh market field tomato transplants. Our purpose was to determine effective application rates for height control in the greenhouse and to study any effects on yield.

Methods

Greenhouse flats of 144 plants each were seeded May 20 with Royal Flush, a fresh market field tomato variety. Using four flats for each treatment replication, we established six treatments: 0.25, 0.5, 1, 2, and 5 parts per million (ppm) active ingredient uniconazole applied on June 8, as well as an untreated control. Treated flats were sprayed with a hand-held applicator, at a

Trial plants were transplanted with a commercial machine and grown under standard field conditions for fresh market tomatoes.

rate of 200 ml solution per square meter. Following treatment, plants received standard greenhouse irrigation and fertilization treatments.

Plant height was measured from soil level to the tallest leaf for 4 weeks before planting into the field on July 22. The plants were originally scheduled to be transplanted on July 7, but field conditions delayed planting.

Results

Significant growth reduction over the untreated control was apparent within a week of treatment at all application rates (fig. 1). After 4 weeks, the degree of height control was generally greater the higher the application rate.

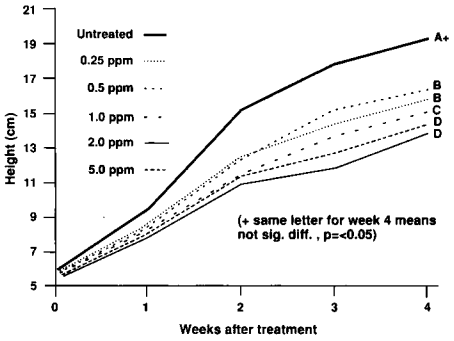

Fig. 1. Uniconazole reduced growth of greenhouse-grown Royal Flush tomato transplants within a week of treatment.

Following 44 days in the greenhouse, the trial plants were transplanted into the field so that we could observe any effects on yield, crop maturity, and fruit size. A commercial transplanting machine was used, and plants were grown under standard field tomato conditions. On October 25, about 4.5 months after treatment and 3 months after field transplanting, all fruit was hand-harvested and evaluated. Maturity information was taken in the field, and fruit sizing results measured in the laboratory.

There were no significant yield, crop maturity, or fruit size differences between treated plants at any rate and the untreated controls, except at the highest rate tested, 5 ppm (tables 1 and 2). In the 5 ppm treatment, a slight reduction in stand survival occurred, with no commercial need to replant. There was also a significant decrease in red fruit, but no significant loss in total marketable yield. This rate therefore may delay maturity.

Conclusions

Under the conditions of this trial, uniconazole was effective for height control of fresh market tomatoes grown as greenhouse transplants. Shelf life was extended at a range of rates without significantly affecting final crop yield. Further work is needed to evaluate effects of the growth regulator on other varieties and treatment at various stages of development.

Uniconazole is not currently registered for this use in California.

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TABLE 1. Field trial yield results after uniconazole treatments, Royal Flush fresh market tomato

Treatment	Yield of fruit/5-foot row*			
	Marketable red	Mature green	Cull	Total◊
ppm	..... *lb*			
0.25	3.8 a	26.9 a	2.4 a	30.8 a
0.50	2.5 ab	31.0 a	0.9 a	33.5 a
1.00	1.8 ab	23.9 a	2.3 a	25.7 a
2.00	1.6 ab	31.8 a	0.8 a	33.4 a
5.00	0.7 b	24.8 a	0.3 a	25.6 a
Untreated	3.5 a	27.2 a	1.6 a	30.7 a

* Average of four replications. Means within a column followed by same letter are not significantly different, p= <0.05, DMRT.
◊ Total yield of marketable red and mature green fruit.

TABLE 2. Fruit sizing results (marketable fruit)

Treatment	Fruit/5-foot row*			
	Extra large	Large	Medium	Small
ppm	..... *lb*			
0.25	3.2	14.2	6.9	6.8
0.50	3.6	14.0	9.0	8.5
1.00	3.0	10.8	7.1	5.8
2.00	5.4	13.8	9.5	5.6
5.00	3.0	11.9	5.9	5.6
Untreated	2.6	12.9	7.6	6.8

* See table 1 footnote.