CASE STUDIES OF CONTROLLED GRAZING SYSTEMS
A Progress Report

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Ranch Monitoring

Historical Information: Controlled Grazing Systems (CGS) on six ranches (Ranches A-F) are being analyzed to determine if profitability improves as they are developed. This project was started in 1989. For each CGS the following enterprise variables are determined annually from ranch records:

a. stock flows
b. calendars of operations
c. gross income
d. variable costs
e. inventory change
f. gross margin

Animal productivity (lb/a) and forage productivity (lb/a/d) are also estimated from ranch records and field measurements. Animal productivity data is reported for four additional ranches (Ranches G-J).

Methods: Changes in animal production (lbs/a) due to controlled grazing were determined by a) comparing production before and after initiation of controlled grazing and b) comparing animal production under controlled grazing to local or regional averages without controlled grazing. In New Zealand regional pasture production standards are used for comparative purposes in pasture and farm management case studies. This is a valid tool for monitoring the impact of managerial change on farms and ranches. Production levels from experiments are not used for comparisons because they are often much greater than that documented on similar farms and ranches. In California's central valley and foothills cool season irrigated pastures produce an average of 10 aum/a or 400 to 500 lb/a of animal product (Jones and Brown 1950). In coastal areas mild winter and summer weather tend to increase yearly productivity. High elevation areas tend to have shorter growing seasons and would be expected to have lower productivities.

Regional animal production standards for rangeland are more difficult to establish because rangeland forage is not irrigated and is produced on a wide variety of sites that vary in their productivity. A few animal productivity standards have been established in the Annual Range Productivity Data Base (George and Jacobsen 1986).

Changes in profitability were estimated by comparing enterprise gross margin (gross income - variable costs) before and after initiation of controlled grazing. Data for these comparisons were collected from ranch records. Livestock prices used in this analysis were five year (1981-85) average monthly prices.

Irrigated pasture growth rates were determined on five ranches in northern California from 1988-90 using an earth-plate capacitance meter (pasture

probe). Pasture growth rate was determined from the change in standing crop between the beginning and end of a pasture rest period. Standing crop was estimated weekly during fast growth, biweekly during periods of moderate growth, and monthly during slow winter growth. Pasture growth rates have not been estimated for rangeland pastures during the current drought.

Results and Discussion

Production: Ranches A and B have 10-12 month irrigated pasture grazing seasons and can produce 500-625 lbs of animal product per acre without controlled grazing. Animal production on Ranches A and B after initiation of controlled grazing ranges from 735-1044 lbs/a (Figure 1). Irrigated pastures on Ranches G-I are similar and adjacent to each other. They normally have a 7-8 month grazing season and typically produce 400-525 lbs/a of liveweight gain without controlled grazing. The irrigated pasture on Ranch J has a 5 to 6 month growing season and produces about 525 lbs/a without controlled grazing. With controlled grazing these irrigated pastures produce live weight gains ranging from 647-993 lbs/a.

Animal production on rangeland increased on Ranch F following initiation of controlled grazing (Figure 2). Ranch F initiated controlled grazing prior to the current four year drought. Ranches C, D, and E initiated controlled grazing during the current drought. Animal productivity during the drought is no worse than the long-term average.

Profitability: Enterprise gross margins were greater during most years following initiation of controlled grazing on Ranches A and F (Figure 3). There were no records prior to controlled grazing available for Ranch B but its gross margins per acre are similar to those of Ranch A. Gross margin for Ranches C and E have declined since initiating controlled grazing. This appears to be the result of high feed costs (Figure 4) during the current drought. A large portion of the rangeland on Ranch C has received little or no use because the stock watering points have dried up.

It will take several years of data to adequately profile profitability on most of these ranches. Even with higher productivities under controlled grazing, gross margin may be adversely affected by increased variable costs and reduced gross income due to changes in market and culling decisions as well as fluctuations in price.

Pasture Productivity: Pasture Growth Rate (PGR) is the daily rate of pasture production. In the winter PGR is slow, often less than 10 lb/a/day. During rapid spring growth PGR can exceed 50 lbs/a/day. The monthly pattern and magnitude of PGR from five irrigated pastures are similar to those of inland pastures on New Zealand's north island (Table 1). The coastal pastures in Humboldt county have PGRs equal or exceeding 15 lbs/a/day during 10 months of the year while inland pastures tend to have longer slow growth periods in the winter. Knowledge of pasture growth rates can be useful in short (1 to 2 months) and long-term (annual) forage budgeting.

Summary

Animal productivity increased during the year following initiation of controlled grazing on irrigated pasture. With time controlled grazing animal

productivity on foothill rangelands was no worse than long-term averages under the current drought. Limited data collected before the current drought indicates that productivity increases are possible on foothill rangelands. Enterprise gross margin is directly related to productivity except where feeding costs are higher than usual due to drought or gross income is lower due to marketing or culling decisions. Irrigated pasture growth rates were found to be similar to those measured on inland pastures in New Zealand.

Literature Citations

Jones, Burle J., and J.B. Brown. 1950. Irrigated Pastures in California. Circ. No. 125, College of Agric., Univ. of Calif., Berkeley, Calif. Pg. 41-43.

George, M.R., and E.A. Jacobsen. 1987. Annual rangeland productivity data base. Range Science Reports No. 15, Agronomy and Range Science Department, Univ. of Calif., Davis, Calif. 26 pgs.

Milligan, Keith. 1981. Feed budgeting. New Zealand Farmer. Dec. 10, 1981. Pg. 25.

Figure 1. Animal production before (open bars) and after (filled bars) intensive grazing management on irrigated pasture.

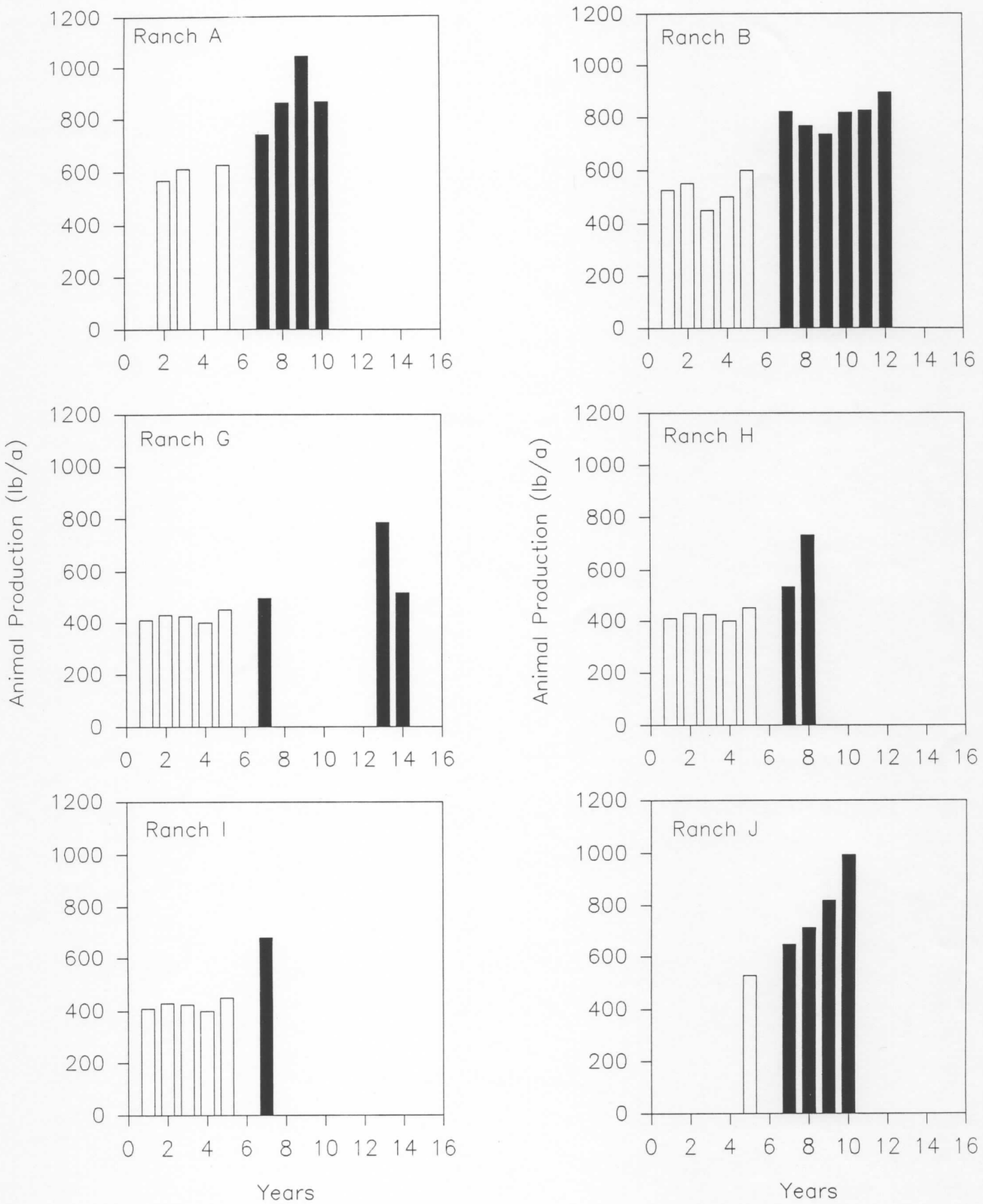

Figure 2. Animal production before (open bars) and after (filled bars) intensive grazing management on annual range.

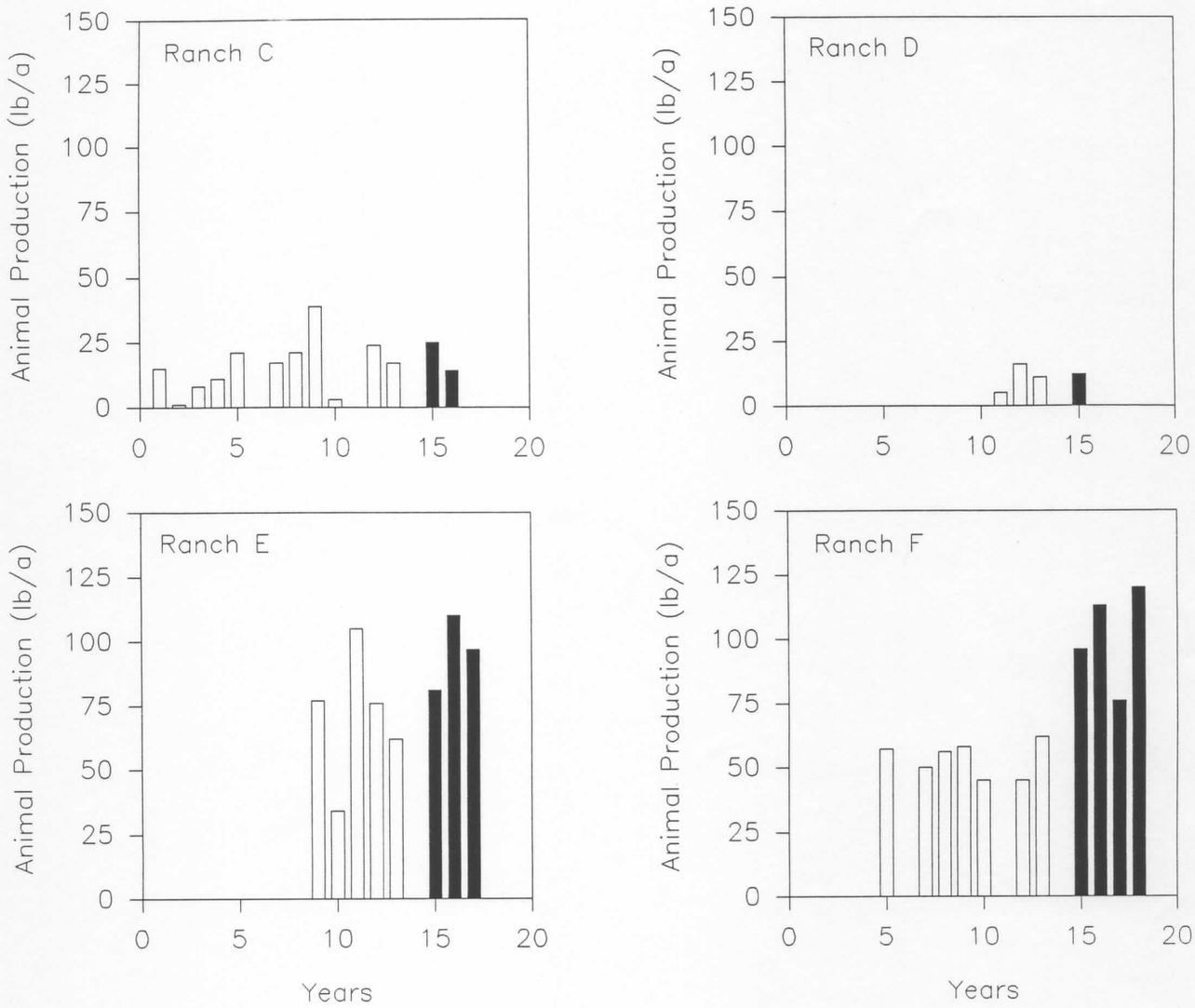

Figure 3. Gross margins before (open bars) and after (filled bars) intensive grazing management.

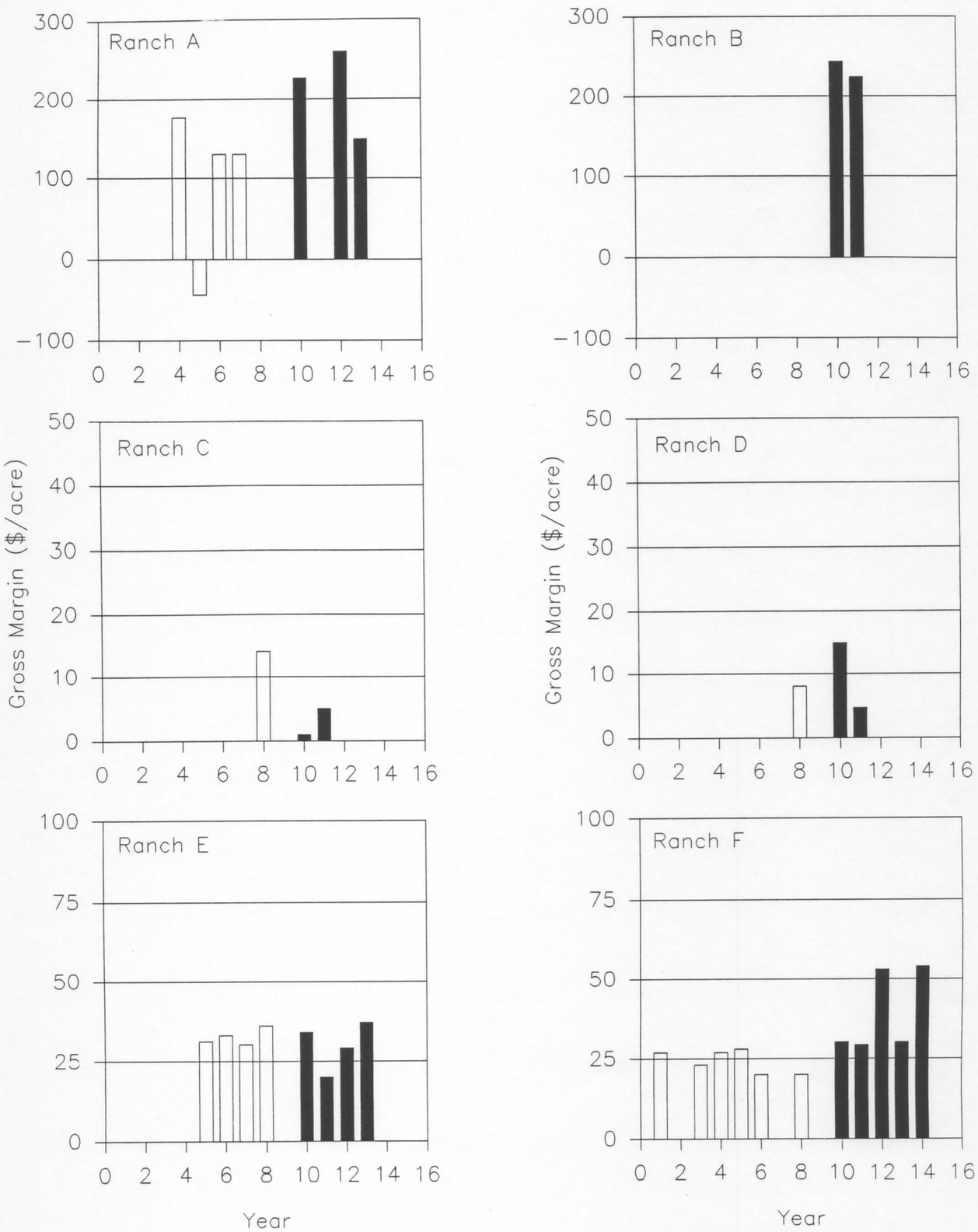

Figure 4. Feed costs ($/cow) before and during the 1987–91 drought.

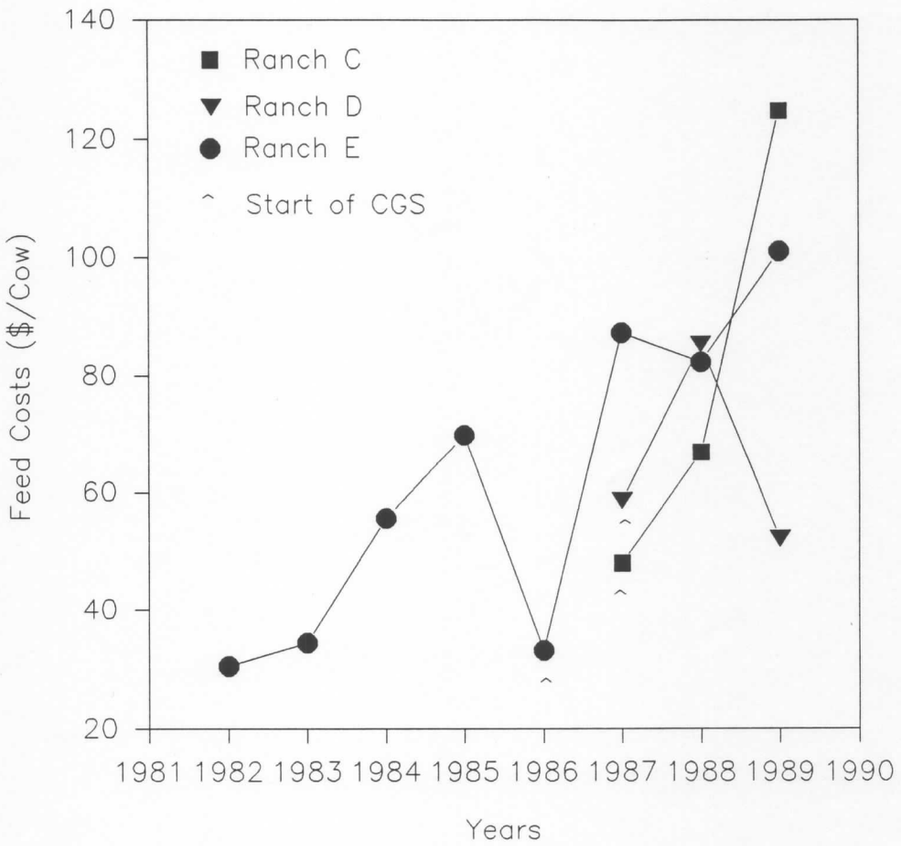

Table 1. Pasture growth rates for five northern California[1] irrigated pastures compared to inland and coastal pastures on New Zealand's north island[2] (Milligan 1981).

	Jan (Jul)	Feb (Aug)	Mar (Sep)	Apr (Oct)	May (Nov)	Jun (Dec)	Jul (Jan)	Aug (Feb)	Sep (Mar)	Oct (Apr)	Nov (May)	Dec (Jun)
	Pasture Growth Rate (kg/ha/d)											
NZ Coast	24	33	50	58	63	73	59	61	50	41	32	25
NZ Inland	7	11	29	45	42	52	34	18	24	18	13	8
Stanislaus	5	23	26	34	58	49	34	27	24	18	12	9
Glenn	7	11	27	43	52	39	41	34	25	17	9	7
Humboldt A	10	22	27	54	50	51	30	45	34	28	17	12
Sutter	7	13	28	45	50	56	49	51	26	17	8	4
Humboldt B	8	10	18	39	33	56	43	20	27	17	24	8
Calif. Ave.	7	16	25	43	48	50	39	35	27	19	14	8

[1]California pastures are various mixtures of perennial ryegrass (Lolium perenne), orchardgrass (Dactylis glomerata), tall fescue (Festuca arundinaceae), "Ladino" white clover, (Trifolium repens) and strawberry clover (T. fragiferum).

[2]New Zealand pastures are dominated by perennial ryegrass and white clover. New Zealand was adjusted by six months so that July data from N.Z. is listed under January.