

Grass-Legume Band Seeding

plant counts compare broadcasting of forage seed mixture and drilling with placed fertilizer after control burn on range

C. F. Walker and B. L. Kay

Establishment of productive legumes and grasses has been a primary goal in an experiment in band seeding forage plants on control burned land in the Cleveland National Forest in San Diego County.

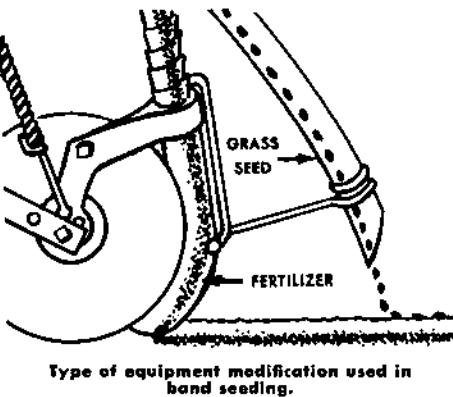
The elevation of the experimental area is 3,000' and the average annual rainfall is 12". Winter rains are generally followed by dry winds that blow in from the desert on the east. The soil is a granitic type of low water holding capacity.

The previous vegetation on the selected site was a dense stand of chamise which was control burned in 1953 by the United States Forest Service. After the burn, ground that could be mechanically worked was disked and railed and divided—for identification—into Pasture A and Pasture B.

During the fall of 1953, Pasture A was broadcast seeded to a mixture of legumes and perennial grasses. Pasture B was seeded to cereal oats. In the spring of 1954, Pasture A was grazed moderately to allow the perennials to seed, and Pasture B was grazed heavily to keep the volunteers down from the next year's range seeding.

Pasture B was disked and railed in August of 1954. The disked served the dual purpose of preparing a seedbed and pulling out many chamise crowns that had started to sprout.

After the seedbed was prepared, a grain drill with a few modifications was used to band seed and fertilize prepared ground. The drill was a conventional 16 opener type with a grass seed attach-



Type of equipment modification used in band seeding.

ment and a fertilizer box. Rubber hoses attached to the grass seeder box made it possible to direct the seed into the furrow directly over the band of fertilizer placed 4" into the ground. As the furrow made by the disks closed, the seed was dropped on top of the ground and covered with a drag chain.

Plants Seeded

The legumes planted were alfalfa, rose clover, and yellow blossom sweet clover, selected as the three species that had shown most promise—out of 32—when tested previously. The seeds were inoculated each morning prior to planting and covered to protect them from the drying sun. The perennial grasses—Harding, veldt, and smilo—were included in the mixture. These grasses have done very well on broadcast seedings but require about two years to become established.

Soil samples and exploratory fertilizer plots showed that the soil was nitrogen-phosphorus deficient. To get the young seedlings off to a good start, 100 pounds of 11-48-0 per acre were placed in rows 14" apart. Every other opener—of the 16 opener drill—was removed to make a wide row spacing which is better for the low rainfall conditions. The wider spacing also allowed trash to feed through the drill and required very little stopping. Only minor repairs were necessary at the end of the drilling operation.

The planting was completed by late November 1954. The seeds germinated in December but grew little because of very cold weather. After a dry winter, there were some late spring rains which helped the seeding considerably. Both grasses and legumes responded very well to the placed fertilizer whose benefits were immediately available to the seedling directly above.

The perennial grasses and, in particular, Hardinggrass and veldtgrass, made a strong first year showing. Many of the seedlings produced seed heads near the completion of their first growing season.

A successful stand of all seeded legumes was obtained also. The winter annual, rose clover, produced an abundant seed crop. The perennial legume, alfalfa, and the biennial, sweet clover, became well established.

Because the experiments were designed to provide good cattle feed—establishing legumes on the land would increase the protein level of the feed and

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Drilled rows of grasses and legumes. Photographed, May 24, 1955.



Plant Count on Broadcast Seeding, Pasture A and on Drilling with Band Fertilizing, Pasture B.

	Broad-cast seeded;	Band seeded; first year stand
	Pasture A	Pasture B
	%	%
Desirable annual grass	29.50	25.50
Undesirable annual grass	1.50	2.50
Seeded legumes	0.00	16.50
Desirable perennial grasses	64.00	46.50
Undesirable forbs	5.00	9.00
Initial cost per acre	\$14.00	\$16.20

Note the favorable comparison of a first year stand—Pasture B—with the established two year stand—Pasture A—and the larger percentage of legumes in the band seeded area.

SEEDING

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increase the fertility of the soil for the perennial grasses—a plant count survey was made to compare broadcast seeding and drilling with fertilizer.

At least 10 pounds of seed per acre were used with the broadcast method. The seeding rate was cut to six pounds per acre by drilling. An excellent stand was obtained with $\frac{2}{3}$ as much legume seed and $\frac{1}{3}$ as much grass seed by drilling, and the saving in seed cost helped to defray some of the expense of the fertilization.

Broadcast legume seed—without help from the phosphate fertilizer—produced small plants and set very little seed.

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Farm Advisors, San Diego County, University of California, and personnel of the U. S. Forest Service, Cleveland National Forest, assisted in the studies reported here.

PEACHES

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quence. The reduction in loss averaged eight percentage points. This means that a ton of fruit yielded an additional 160 pounds.

An additional allowance must be made for losses in weight that take place while the peaches are hauled from the grading station and stored at the plant prior to pitting. For the test period, an average shrinkage loss of 2.7% was observed.

This value may not be representative of normal operating conditions in commercial canneries. Peaches obtained for the test were hauled promptly from the grading stations to the pilot plant, and handled rapidly at the plant. The total elapsed time averaged only 18 hours—considerably less than for peaches canned commercially. Certain other factors may have contributed to low shrinkage losses for the test lots.

Results of the pilot test suggest that cannery losses may be decreased appreciably below the levels now prevailing.

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The above article is based on a study initiated at the request of, and partly financed by, The Cling Peach Advisory Board. A more complete report by the same authors, entitled Cannery Losses for Cling Peaches, 1954 Season, is available by addressing the Giannini Foundation of Agricultural Economics, 207 Giannini Hall, University of California, Berkeley 4.



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CANTALOUPES

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Spoilage, retail margins, and consumer prices vary among the stores surveyed. Location, size, and type of store provide a partial explanation for such differences.

Losses due to waste and spoilage tend to be higher in small cities, in small stores, and in independent stores than in large cities, large stores, and chain stores, respectively. Retail margins are usually higher in southern California, large cities, and independent stores than in northern California, smaller cities, and chain stores. Prices paid by consumers are considerably higher in small

stores and credit-delivery stores than in large stores and cash-and-carry stores, and somewhat higher in small cities than in large cities.

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The above article is based on a study undertaken jointly by the California Agricultural Experiment Station, the California Farm Bureau Federation, and the former Bureau of Agricultural Economics—now largely in the Agricultural Marketing Service—U.S.D.A.

A more complete report, the sixth in a series, entitled California Cantaloupe Marketing Channels and Farm-to-Retail Margins, 1949 Season, is available by addressing the Giannini Foundation of Agricultural Economics, 207 Giannini Hall, University of California, Berkeley 4.

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