PUBLICATIONS
2004

FIELD-SCALE ALFALFA PRODUCTION ECONOMICS ON COASTAL PLAIN SOILS

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Background. Research trials indicated the potential for successful field-scale alfalfa production. Grant funds from the USDA Southern Region Sustainable Agriculture Research and Education Program in 1999 allowed Texas Agricultural Experiment Station scientists and Texas Cooperative Extension specialists to evaluate alfalfa production on field sites. Stakeholders cooperated in this program by providing five-plus acre field locations on which to plant and grow alfalfa. Site selection for potential locations on each ranch included collecting 0- to 6-inch depth soil samples for the standard soil analyses and samples from the 6-12, 12-24, 24-36, and 36-48-inch depths. Analysis of the four subsurface depth samples for pH, evaluation of surface and internal soil drainage, and consultation with the ranch owner were used to select the site for alfalfa. The pH of the one-foot depth samples had to be 5.5 or higher and the site had to be well drained. Each selected site was treated with limestone to raise the 0-6-inch depth pH to 6.8 to 7.0. Sites were disked to eliminate bermudagrass and fertilized with a blend containing phosphorus (P), potassium (K), magnesium (Mg), sulfur (S), and boron (B). Nitrogen was added because the fertilizer blend included diammonium phosphate (18-46-0) applied at 100 to 120 lb of P_2O_5/acre depending on the soil test P level. The surface soil was firmed using a weighted roller to prepare it for seeding. Roundup® was applied for weed control if needed. Amerigraze 702 and GrazeKing alfalfa varieties were seeded with each variety covering half the acreage at each site. Weeds and insects were controlled. Four one meter-square samples of each variety were collected to estimate yield before each harvest. These samples were oven dried and yields were adjusted to 12-percent moisture. Records were maintained for all operations conducted to produce alfalfa on each stakeholder site.

Research Findings. The costs and returns calculated for alfalfa on each ranch are shown in Table 1. Alfalfa establishment costs on each site ranged from $232 to $353 per acre and varied by $121/across sites. This variation was mainly due to increased amounts of limestone needed to correct soil pH and to pre-planting, site-selective weed control using Roundup. Other operations included in establishment costs were soil sample analysis, disking and other seedbed preparation activities, planting, fertilizer, pest control, and alfalfa seed planted at 25 lb/acre. Limestone was estimated to cost $28/ton spread. Fertilizer costs varied between $48 and $80/acre depending on the initial soil fertility levels at each site. Alfalfa seed was priced at $3.70/lb. Fencing to prevent cattle entry into these fields varied by site and was not included in the establishment cost.

In Table 1, with alfalfa hay priced at $135/ton, the value of alfalfa produced is shown for years three and four. The net return/acre was calculated by subtracting annual production expenses, custom haying, hauling, interest charges, and establishment costs that were prorated over four years. Annual production expenses included fertilizer, herbicides, insecticides, and cost of machinery that included fuel and lubrication, repairs, and labor. Net return per acre in year 3 varied between $(-100.98) and $328.86 and between $200.47 and $318.43 in year 4.

Application. The two-year total estimated net return per acre for years three and four on the four sites ranged from $109.61 to $647.29 with the establishment costs prorated over four years. Several of these alfalfa fields have continued production into the fifth year. These data from field production verify the increased economic opportunity provided by production of alfalfa as a hay crop compared to the more important grass hay crops produced on the Coastal Plain soils of East Texas.

Table 1. Economic production estimates for alfalfa grown on five-plus acre SARE field sites.

Production Factors	GRIFFIN Ranch	7P Ranch PRUD'HOMME	TAYLOR Ranch (THRELKELD)	RILEY Ranch
	$/acre			
Establishment Cost	232.28	252.63	326.13	352.65
Year 3 (2002) Hay Value†	461.36	703.69	534.16	241.25
Production Expenses	164.58	149.37	136.06	178.80
Haying, Hauling & Interest	91.69	137.30	104.79	50.26
Overhead‡	83.07	88.16	106.53	113.16
Net Return/Acre	122.02	328.86	186.77	(-100.98)
Year 4 (2003) Hay Value†	489.00	608.41	485.90	506.42
Production Expenses	84.23	84.23	84.55	84.43
Haying, Hauling & Interest	94.93	117.59	94.34	98.24
Overhead‡	83.07	88.16	106.53	113.16
Net Return/Acre	226.77	318.43	200.47	210.59
2 YR TOTAL NET§ RETURN/ACRE	348.79	647.29	387.24	109.61

† Alfalfa valued at $135 per ton of 12% moisture hay.

‡ Machinery & equipment, land, and with establishment costs prorated over four years of production.

§ Four harvests were made on 7P and Taylor ranches, three on Griffin ranch, and only two on Riley ranch (extended grazing) in 2002; Five harvests on the Riley ranch, and four on Griffin, Taylor, and 7P ranches in 2003.