Comparative Costs for Fence Construction

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Fencing is essential for many agricultural activities, especially forage and livestock production. Traditionally, woven wire or barbed wire fences have been used to confine livestock. Recently two new types of fencing, high-tensile non-electric (HTNE) and high-tensile electric (HTE), have been introduced from New Zealand and Australia. High tensile non-electric fences are constructed using 6 to 10 plus strands of smooth high-tensile galvanized wire. Springs are used to maintain wire tension and provide *"give"*. Electric fencing has been used for temporary fencing in the U.S., but with the introduction of high-tensile galvanized wire and high power low-impedence energizers, permanent multi-wire electric fences are feasible. These fences control livestock with a high energy, short duration electrical charge.

Investment decisions about new or replacement fences are complicated by the large number of alternatives available. A microcomputer program was developed to provide a convenient and flexible method to compare material costs for alternative fence types. User specified inputs were: pasture dimensions and area; number of wires; post type, size and spacing; gate type and size; necessary bracing and accessories. An itemized listing of material costs, total costs and cost per unit length and area were provided in the output.

The program was used to compare four fence types; woven wire, barbed wire, HTNE and HTE. A hypothetical fence enclosing 20 acres was used as an example to develop material lists and costs. The fence was 933 feet on each side, with a total linear footage of 3,732 feet. One 16-foot metal gate was included, and double brace posts were used at each corner. The woven wire fence had 4-inch diameter treated wood posts 12 feet apart, with a single strand of barbed wire at the top (Table 1). Barbed wire fence construction used five strands of barbed wire on 4-inch, treated wood posts 12 feet apart (Table 2). The HTNE fence had 10 strands of high-tensile 12.5 gauge wire 6 inches apart on 4-inch treated wood posts 20 feet apart (Table 3). The HTE fence included five strands of high-tensile 12.5 gauge wire with three being energized and two being grounded. Steel posts 6.5 feet long and 25 feet apart were used. A 110-volt A.C. energizer was also included to power the fence (Table 4).

Supply costs included in the program were averages of prices obtained from responses to a survey of manufacturers and distributors of fencing equipment. Shipping and handling costs were not included.

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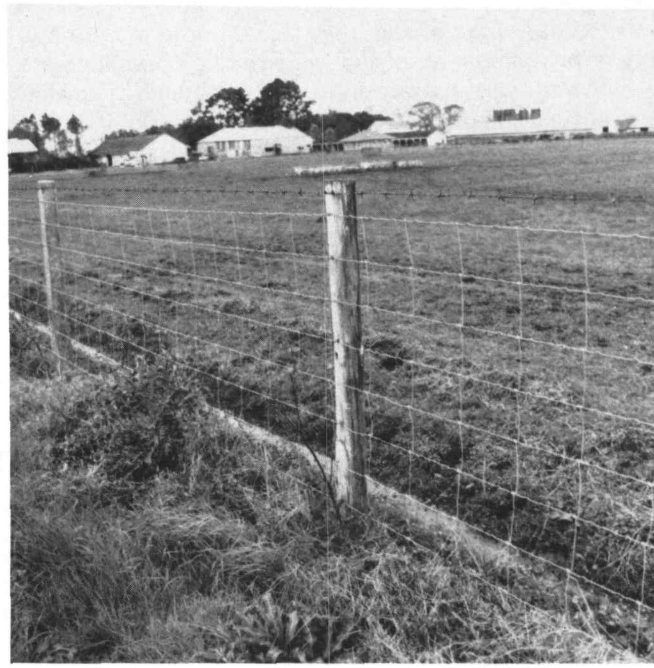


Woven or net wire.

Table 1. Cost of woven wire fence.

Item	Unit	Amount required	Cost/ unit	Total cost
Steel gate, 16′	ea.	1	$ 80.00	$ 80.00
Wood post, 4″	ea.	316	5.75	1817.00
Wood post, 6″	ea.	24	11.84	284.16
Wood post, 8″	ea.	5	19.44	97.20
Staples	lbs	6	0.85	5.10
Barbed wire (1320′)	roll	4	40.00	160.00
Netted wire (330′)	roll	12	110.00	1320.00
Total				3763.46
Cost/ft				1.01

Based on a study done in Virginia (1), some comparisons among the fence types can be made based on useful life and average yearly maintenance costs. Values for barbed wire fence were not included in this study, so estimates were made (Table 5). Reported labor requirements were revised.

These comparisons have shown that HTNE and HTE fences are less expensive to build, last longer and cost less to maintain than traditional barbed wire or woven wire fences. The HTE fence is less expensive than the HTNE fence to

Six-strand barbed wire.

Table 2. Cost of barbed wire fence.

Item	Unit	Amount required	Cost/ unit	Total cost
Steel gate, 16′	ea.	1	$ 80.00	$ 80.00
Wood post, 4″	ea.	316	5.75	1817.00
Wood post, 6″	ea.	24	11.84	284.16
Wood post, 8″	ea.	5	19.44	97.20
Staples	lbs	5	0.85	4.25
Barbed wire (1320′)	roll	15	40.00	600.00
Total				2882.61
Cost/ft				0.77

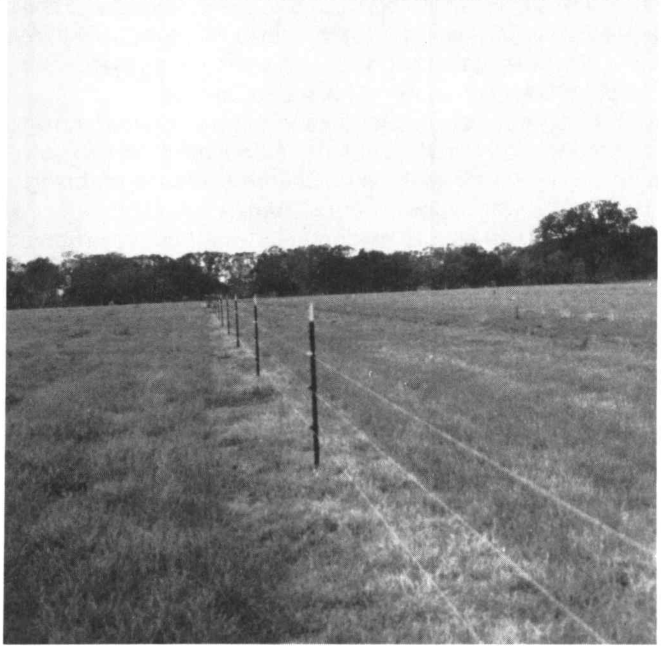
Table 4. Cost of high-tensile electric fence.

Item	Unit	Amount required	Cost/ unit	Total cost
Butt plate	ea.	144	$ 0.10	$ 14.40
Ground rod	ea.	3	1.31	3.93
110 AC energizer	ea.	1	245.66	245.66
Gate handle	ea.	2	3.63	7.26
Porc. insulator	ea.	25	0.34	8.50
Steel post Inst.	ea.	720	0.15	108.00
Wood post Ins.	ea.	24	0.12	2.88
Steel post, 6.5′	ea.	144	2.10	302.40
Wood post, 4″	ea.	16	5.75	92.00
Wood post, 6″	ea.	24	11.84	284.16
Wood post, 8″	ea.	5	19.44	97.20
Ground rod, 6′	ea.	3	8.30	24.90
Springs	ea.	20	5.70	114.00
Strainers	ea.	20	2.15	43.00
Switches	ea.	1	6.90	6.90
Wire dispenser	ea.	1	62.52	62.52
High-tensile, 4000′	roll	5	55.25	276.25
Ins. wire, 16 ga (100′)	roll	1	15.40	25.40
Total				1709.36
Cost/ft				0.46

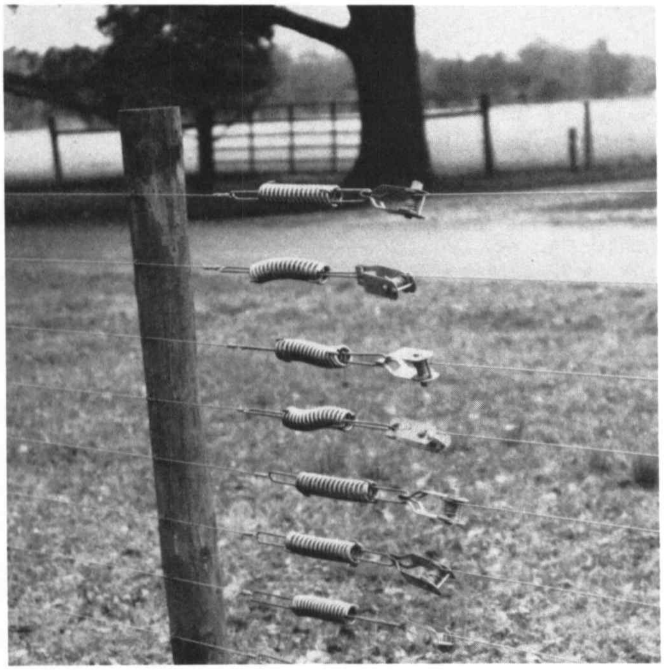
High tensile, ten strand, non-electric.

Table 3. Cost of high-tensile non-electric wire fence.

Item	Unit	Amount required	Cost/ unit	Total cost
Steel gate, 16′	ea.	1	$80.00	$ 80.00
Wood post, 4″	ea.	196	5.75	1127.00
Wood post, 6″	ea.	24	11.84	284.16
Wood post, 8″	ea.	5	19.44	97.20
Springs	ea.	40	5.70	228.00
Staples	lbs	10	0.85	8.50
Strainers	ea.	40	2.15	86.00
Wire dispenser	ea.	1	62.52	62.52
High-tensile, 2000′	roll	1	37.17	37.17
High-tensile, 4000′	roll	9	55.25	497.25
Total				2507.80
Cost/ft				0.67



Three-strand, high tensile electric



Springs and ratchets used to maintain tension in high-tensile fences.

Table 5. Useful life, maintenance and labor requirements.

Item	Woven wire	Barbed wire	HTNE	HTE
Useful life (years)	20	20	30	25
Avg. yearly maintenance (% initial cost)	8	8	3	6
Construction labor required[a] (hours)	120	110	90	50

[a]Adjusted for 3,733 feet of fence.

build but is more expensive to maintain and has a shorter useful life.

Software Availability

The program was written in BASICA for use on an IBM-PC equipped with 256 K. The program may be obtained from the authors for $5.00 (check payable to the Louisiana Agricultural Experiment Station) to defray costs of duplication. Send requests to Iberia Research Station, P.O. Box 466, Jeanerette, LA 70544.

References

Burton, R.O., Jr., and M. Rouhani-Iravan. 1986. Fencing strategies for livestock producers: An analysis of comparative costs of traditional and high-tensile fences. J. Amer. Soc. Farm Managers and Rural Appraisers 50(1):52-57.

Restoring Burned-out Rangeland

Helping Mother Nature restore millions of acres of western rangeland devastated last year by the most extensive wildfires in decades will be a top priority of a new team of U.S. Department of Agriculture researchers in Reno, Nov.

"Fire on the rugged slopes of the Sierra Nevada destroyed many plants that control erosion and provide food and shelter for cattle and wildlife," said James A. Young, research leader of the new Landscape Ecology of Rangelands Research Unit of USDA's Agricultural Research Service.

"The loss of range habitats can be an economic blow to ranchers and fatal to wild animals," said Young. "We've got to find new and better ways to quickly re-establish plants that protect soil and provide food for animals.

"We're still working to revegetate burned out, overgrazed and polluted rangeland," he said. "But instead of using soil scientists to do the whole job, we're hiring researchers with expertise in soil morphology, ecology and physiology to refine and expand the research we did when we were called the Renewable Resource Center."

Young said the new research team will take a broader scientific approach to problems. For example, he added, "Winds sweeping down the slopes of the Sierra Nevada erode soil and create duststorms that pose a severe hazard to areas denuded by wildfires."

Co-worker Robert R. Blank, a soil morphologist, is studying the effect of wind-blown soil and dust on the way seeds germinate. "Dust is a serious problem, even here in Reno where dust causes breathing problems, accumulates on highways and damages homes," said Blank.

He is also analyzing organic compounds produced in the soil by high-temperature range fires. "These new compounds can make soil 'hydrophobic' so it repels moisture rather than absorbing it," he said. "We want to know if they accumulate in the soil over time and how they affect plant growth."

Young said that Anthony J. Svejcar, an ecophysiologist, is focusing on the growth of plants as they occur naturally in the field. He's examining the effects of wildlifes and other "disturbances," like overgrazing, on beneficial soil microorganisms like mycorrhizae, which help plant roots take up needed nutrients.

"This is an aspect of wildfire damage that's never been fully explored," Svejcar said. He wants to know how these microorganisms normally interact with plant roots and how environmental disturbances change these interactions.

Svejcar also looks for answers to complicated ecological questions by studying plant competition: the way certain alien plants enter an area, compete with, and even replace native plants.

"We're also in the process of hiring an animal ecologist," said Young. "We need to know more about the role of rodents, birds and insects in collecting, hiding, consuming and modifying seed (by removing husks and seedcoats) so they germinate."—*USDA Research News*