

The Cost of Controlling Dust in Feedlots

Bridget Guerrero, Steve Amosson, and Lal Almas, TCE-Amarillo, WTAMU-Canyon

Funding for this study was provided through the federal Air Quality Initiative.

BACKGROUND:

Feedlot dust is a critical problem that contributes to cattle death and illness. One of the most economically damaging problems to a feedlot is the bovine respiratory tract disease. Bovine respiratory tract disease causes 75 percent of all illness and 64 percent of all cattle death in feedlots (MacVean et al., 1986). Livestock producers can improve the environment and increase cattle productivity through implementation of dust management practices. Studies indicate water sprinklers are recommended to help control dust by keeping the surface manure moisture above 30 percent (Sweeten et al., 1988), which reduces dust potential directly and facilitates compaction to the maximum practical extent (Auvermann, 2005-personal communication).



OBJECTIVE:

- Identify the initial investment and operational costs associated with a solid-set sprinkler system.

RESULTS:

Estimated annual fixed costs, as well as operational costs, were combined to determine the total costs associated with a solid-set sprinkler system to control dust in a feedlot. Total costs in terms of \$/head capacity are \$4.09, \$2.96 and \$2.79 per head for a 10,000-, 30,000- and 50,000-head capacity feedlot, respectively. Three different turnover rates were used to convert dollars per head capacity to dollars per head marketed. With these three turnover rates, annual fixed cost, operational cost and total cost were calculated on a per-head marketed basis. Dependent upon the capacity of the feedlot and the respective turnover rate, the annualized total cost to install and operate a solid-set sprinkler system ranges from \$2.34-per-head marketed to \$1.24-per-head marketed (Table 1) based on a 25-year useful life. Therefore, minimal reductions in death loss and improvements in animal performance would be required to pay for the system. In addition, the positive externalities associated with fewer dust events could far outweigh all costs.



Table 1. Total annual cost including fixed and operational costs (\$/head marketed) for a solid-set sprinkler system based on a 25-year useful life for various feedlot capacities and turnover rates.

Head capacity	Turnover rate (head marketed/head capacity)	Fixed cost (\$/head marketed)	Operational cost (\$/head marketed)	Total cost (\$/head marketed)
10,000	1.75	\$2.08	\$0.26	\$2.34
	2.00	\$1.82	\$0.23	\$2.05
	2.25	\$1.62	\$0.20	\$1.82
30,000	1.75	\$1.46	\$0.23	\$1.69
	2.00	\$1.28	\$0.20	\$1.48
	2.25	\$1.14	\$0.18	\$1.32
50,000	1.75	\$1.37	\$0.22	\$1.60
	2.00	\$1.20	\$0.20	\$1.40
	2.25	\$1.07	\$0.17	\$1.24