Effect of Dust on Feedlot Health and Production

Dr. O. Abe Turgeon

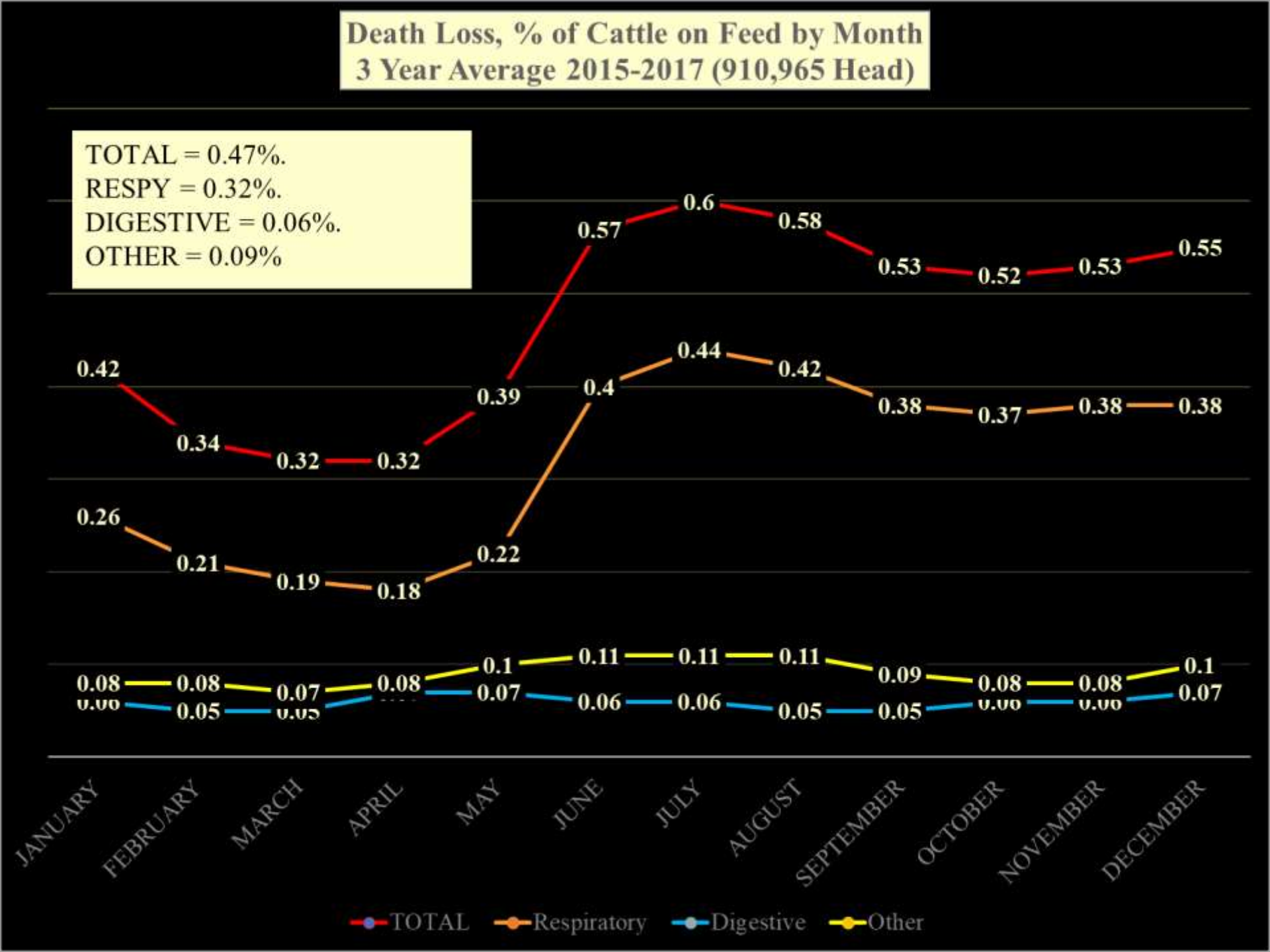
Dust and Pnuemonia Incidence in Feedyard Cattle

- Respiratory Disease was associated with dust particles 2-3.3 microns diameter.
- 10-15 day lag period post dust exposure.

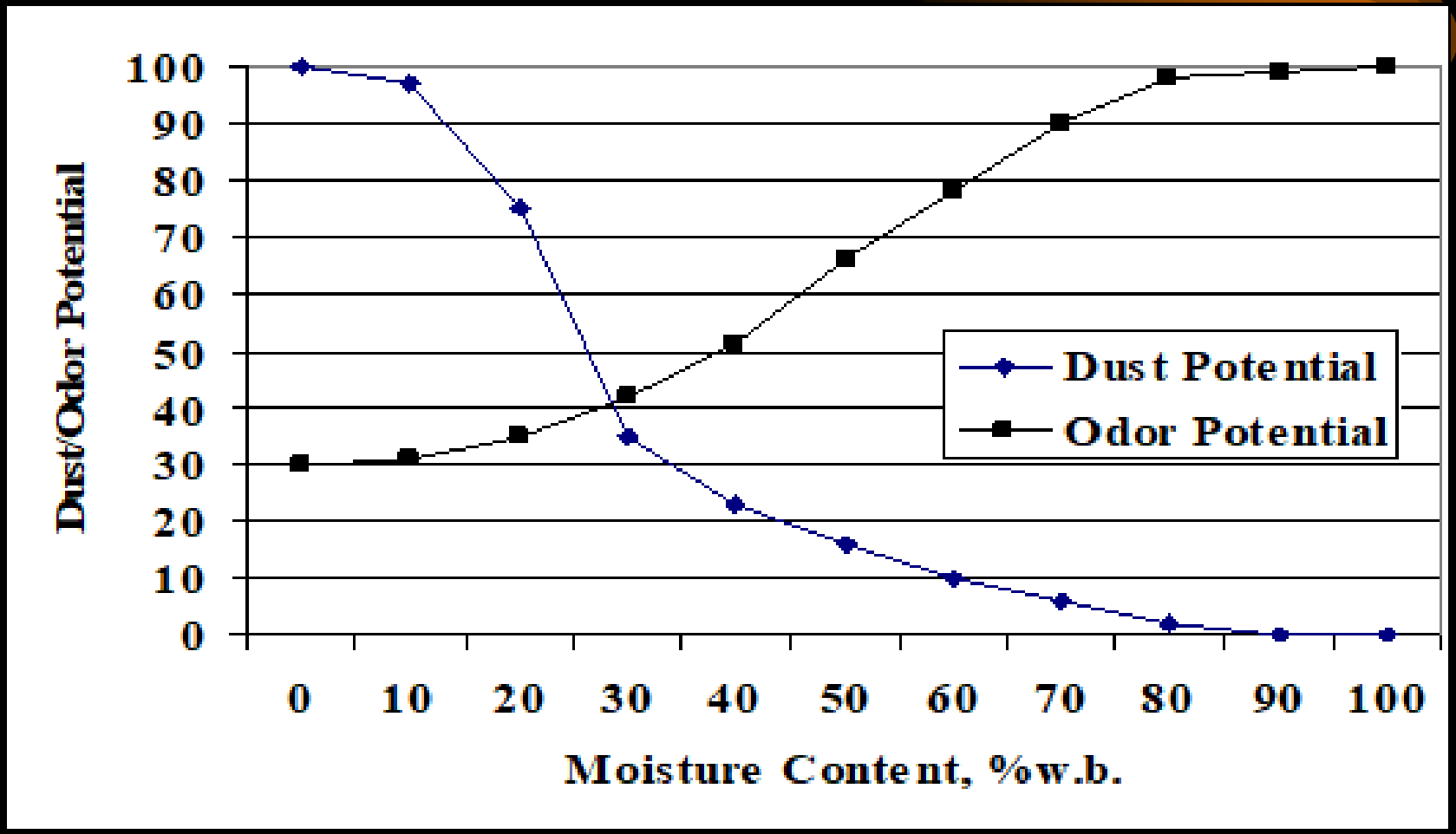
MacVean et al., 1986.

AIP Syndrome in Feedlot Cattle

- Many possible triggers theorized
  - BRSV virus
  - Dust inhalation
  - Bacterial infection (lung or liver)
  - Protein rich diet
  - MGA
  - Inhalation of fungus
  - GI upset or acidosis
  - Heat
  - Feed Change


Death Loss, % of Cattle on Feed by Month
3 Year Average 2015-2017 (910,965 Head)
TOTAL = 0.47%.
RESPY = 0.32%.
DIGESTIVE = 0.06%.
OTHER = 0.09%
0.42
0.34
0.32
0.32
0.39
0.57
0.6
0.58
0.53
0.52
0.53
0.55
0.26
0.21
0.19
0.18
0.22
0.4
0.44
0.42
0.38
0.37
0.38
0.38
0.08
0.08
0.07
0.08
0.1
0.11
0.11
0.11
0.09
0.08
0.08
0.1
0.05
0.05
0.07
0.06
0.06
0.05
0.05
0.07
JANUARY
FEBRUARY
MARCH
APRIL
MAY
JUNE
JULY
AUGUST
SEPTEMBER
OCTOBER
NOVEMBER
DECEMBER
TOTAL
Respiratory
Digestive
Other

25-40% Moisture Optimum in a Feedyard



Lorimor, 2003.

Dust Control Strategies

Lagoon Water via Sprinkler System for Dust Control - Performance

Item	Not Exposed	Exposed	P-Value
Steers, n	1860	1877	
ADG, lb/hd/d	3.45	3.45	0.73
DMI, lb/hd/d	20.2	20.3	0.51
DMC	5.88	5.88	0.41

Loneragan et. al., 2005.

Lagoon Water via Sprinkler System for Dust Control - Health

Item	Not Exposed	Exposed	P-Value
Steers, n	1860	1877	
Morbidity, %	2.8	1.9	0.12
Mortality			
Total, %	0.64	0.58	0.76
Respiratory, %	0.21	0.21	0.99

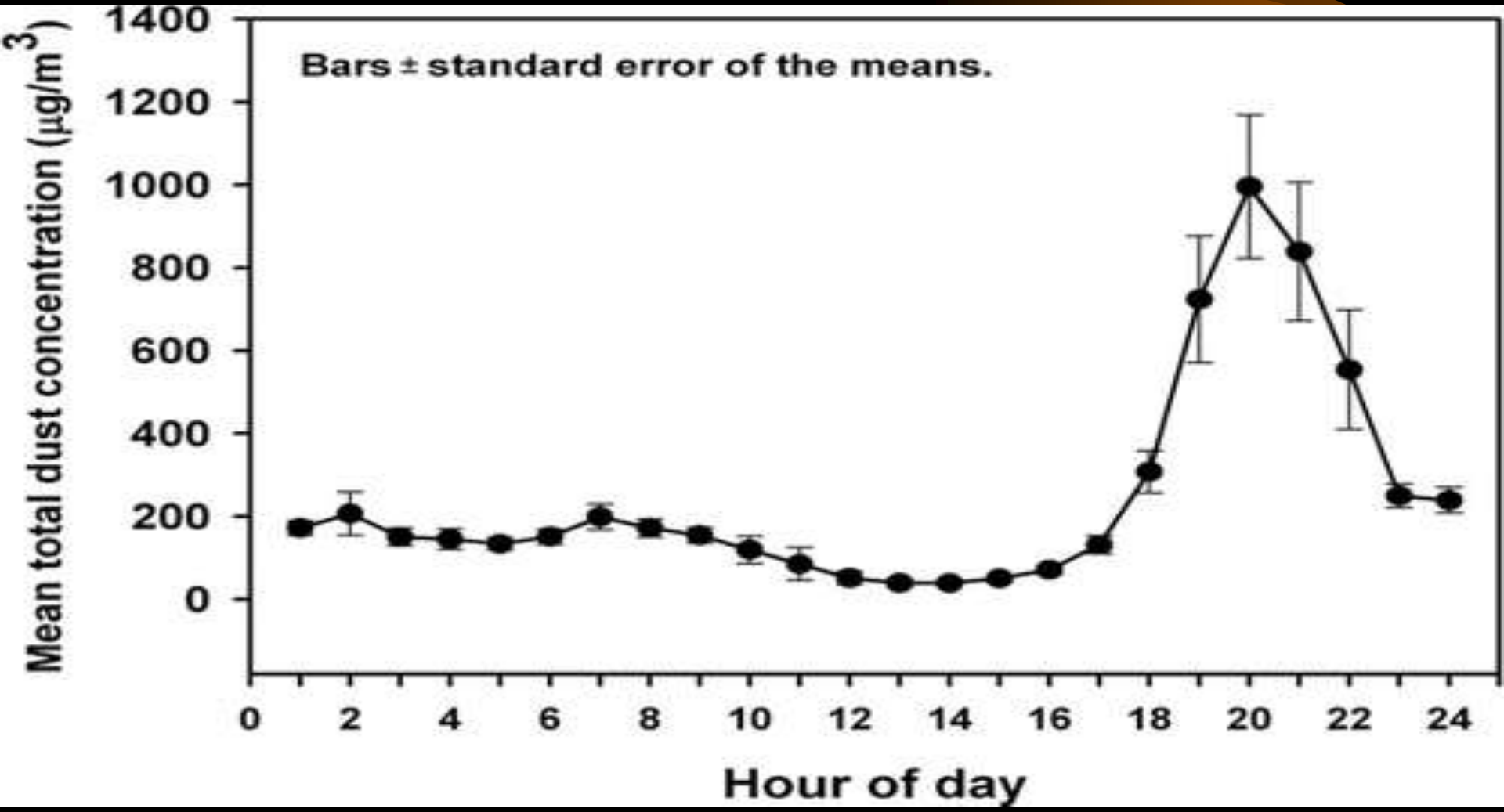
Loneragan et. al., 2005.

Exposed vs Not Exposed Lagoon Water-Pathogen Load

- No differences existed in the prevalence of *E coli* O157 or *Salmonella spp* in feces or on hides.

Loneragran et al., 2005.

Dust Concentration-4 Texas Feedyards (45,000-175,000 hd/yard) Within 62 Miles of Each Other. DUSK = DUST!



Purdy et al., 2007.

Changing Feed Delivery-Dust Concentration PM2.5

Dust Concentration PM2.5, mg/m3	CONTROL Feed 1 7:00 am 33% Feed 2 10:00 am 33% Feed 3 12:00 pm 34%	TREATMENT Feed 1 7:00 am 30% Feed 2 10:00 am 20% Feed 3 6:30 pm 50%	P-VALUE
Downwind	0.115	0.072	0.004
Upwind	0.036	0.035	0.87
Net Difference	0.080	0.036	0.042

Mitlohner, 2000.

Changing Feed Delivery-Performance (7 pens/treatment. 2813 Steers)

Item	CONTROL Feed 1 7:00 am 33% Feed 2 10:00 am 33% Feed 3 12:00 pm 34%	TREATMENT Feed 1 7:00 am 30% Feed 2 10:00 am 20% Feed 3 6:30 pm 50%	P-VALUE
ADG, lb/hd/d	3.12	2.99	0.10
DMI, lb/hd/d	19.2	18.5	0.004
DMC	6.13	6.21	0.61

Mitlohner, 2000.

Changing Feed Delivery-Health

- No differences existed for Medicine Cost or Death Loss.

Mitlohner et al., 2000.

Stocking Density - Sweeten, 1982

- "Stocking rates in Texas and the Southwest typically range from 100 to 175 square feet per head. Research in California showed that when stocking rates were increased to 70 to 80 square feet per head no detrimental effects on daily gain were observed and feed conversion was slightly lower."

- "Research in Arizona indicates that a space allocation of about 0.1 square feet per pound of live weight controls dust in moderate weather."

Effect of Pen Space on Performance – IWT 459 lb. FWT 772 lb. 113 DOF. 2 pens/TRT. (Little Rainfall).

Item	59 Sq Ft/Hd	120 Sq Ft/Hd	237 Sq Ft/Hd
Number Hd	48	24	24
ADG, lb/hd/d	2.71	2.77	2.84
DMI, lb/hd/d	15.9	16.5	16.9
DMC	5.89	5.97	5.95

Niekerk and Jacobs, 1984.

Dust Abatement - Key Points

- Harvest and haul manure frequently.
- Increasing stocking density controls dust.
- Cutting total death loss in half projects 1.2% points less death loss and 3.6% cheaper cost of gain.


MANAGEMENT