

A dusting problem

Controlling feedyard dust and odor can improve cattle performance and your image with the neighbors.

Nuisance management is becoming a growing concern for feedlot operators, particularly those located near urban sprawl. More than one million acres of productive agricultural land are lost to urbanization, industrial development and expanding transportation networks every year. As towns and subdivisions stretch into rural areas, city-dwellers are brought into contact with livestock production, often for the first time. These folks have limited understanding or patience for the sights, smells and sounds of agriculture.

Dust, odor and flies remain the main topics receiving scrutiny, but noise, traffic and even animal treatment are all concerns that have been raised by the public regarding livestock production. Brent Johnson, owner of

Ocho Vaca Cattle Company, a 3,400 head feedyard east of Fort Collins, Colo., says, "Do you know how many people need to complain to get the county health department to visit a feedlot? One." With a highway bordering one side of the feedyard, and encroaching development less than one-half mile from the facility, dust control has become an important issue.

Mr. Johnson uses a combination of pen watering, regular manure removal, and increased pen stocking rates to manage dust. A tanker truck with 3,000 gallon capacity is used to spray the cattle, which both cools the animals and wets down the pens. The feedyard has access to irrigation ditch water and well water, but prefers to use the warmer ditch water on the cattle because "the colder well water can shock the animal's system on a hot day."

Feedyard staff members are also exploring adding bedding material to pens as a method of reducing airborne and pen surface dust. Crop residues such as straw, waste hay, cotton gin trash, woodchips, and sawdust provide a top dressing for pen surfaces, keeping more moisture in the upper layer of the manure pack. Bedding materials are also typically high in carbon, which helps expedite the breakdown of manure, espe-

cially when it's composted.

Various synthetic and plant based oil blends also are used as dust suppressants, along with hygroscopic agents like calcium chloride and magnesium chloride. These products generally control dust on the road bed or alley by either binding fines together or continuously absorbing moisture from the atmosphere.

Tom McDonald, Environ-

mental Manager for Conti-Beef, which has feedyards in Texas, Kansas, Oklahoma and Colorado, has used magnesium chloride on internal feedlot roads and found that an average application controls dust for about 30 to 45 days, as long as no significant rainfall is received. Mr. McDonald is also trying emulsified asphalt, a highway sealant, and has been impressed



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DUST MANAGEMENT PRACTICES:

- Remove top layer of fine manure from pen surfaces regularly
- Sprinkle pens and alleys
- Increase pen stocking density
- Use water or commercial dust suppressants on roads

ODOR MANAGEMENT PRACTICES:

- Maintain good pen drainage to minimize wet areas
- Harvest manure from pens and under fences regularly
- Minimize stockpiled manure and lagoon water
- Land apply waste in the morning and early afternoon
- Compost manure and aerate lagoons
- Avoid feeding excess nitrogen and sulfur in the diet

Dust is often a contributor to bovine respiratory disease, particularly in cattle that are already stressed.

with the results. “The emulsified asphalt is more expensive, but one application is good for a year, and possibly longer once a base is built up.” Many dust suppressant products provide the added benefit of enhancing road base stability, which reduces maintenance.

Beyond managing dust to minimize neighbor complaints, there is another reason to control dust that is closer to the pocketbook. Dust is often listed as a contributor to the development of bovine respiratory disease, particularly in cattle that are already stressed from weaning, shipping and processing. Under those circumstances, excess dust may further compromise the bovine immune system, making the animal more susceptible to respiratory illness.

Sprinklers also are used more widely in the feedlot

industry. Sprinkling systems provide other advantages as well, according to Ron Parks, environmental manager for Simplot Land and Livestock, which operates feedyards in Idaho, Washington and Oregon. “We use sprinklers for the animal’s health, not for the environment. Sprinklers improve conditions for our cattle and reduce the number of pulls.”

Sprinkling pens significantly reduces particulate emissions, and a recent University of Nebraska study also found sprinkling feedlot cattle with water to reduce heat stress improved feed conversion.

DeWayne Christensen of Picabo, Idaho-based Feedlot Environmental Systems, estimates the cost of installing a sprinkler system in a 40,000 head feedyard at about \$12 per head. He cites a reduction in cattle respira-

tory problems, heat stress, and bloat as ways the systems pay for themselves. Mr. Christensen indicates that happier neighbors and employees are added benefits. Some feedyards are also using sprinkler systems to apply fly control insecticides.

For dust, however, sprinklers and misters are not a cure-all. The only way to completely control dust is to create wet pens, and wet pens increase odor and fly problems. And while dust can exacerbate cattle health problems, muddy pen conditions may hurt cattle performance. The key to using sprinklers is to apply just enough to cool the cattle and settle the dust. Research has shown that odorous compounds can hitch a ride on dust. So, controlling dust can also help control odor.

Like dust, odor will never be eliminated from feedyards. Odor is generated as bacteria break down organic matter, such as manure and feedstuffs, which will always be abundant in livestock production.

But there are ways to reduce odor. Dr. Brent Auverman, Texas Cooperative Extension, says “most of the offensive odor producing compounds from manure are associated with anaerobic bacteria, which work in the absence of oxygen.” The lack of oxygen requires the bugs to digest waste-borne nutrients differently than aerobic bacteria, which work in the presence of oxygen. As a result, anaerobic bacteria generate certain odorous compounds at much higher levels than bacteria working in an oxygen-rich environment.

A stockpile of manure, for example, may have aerobic bacteria working on the surface of the pile, and may

give off minimal odor if undisturbed. But dig into the pile with the loader bucket and you quickly discover a very different type and magnitude of odor, which is indicative of anaerobic digestion.

The variety of compost turners and lagoon aeration devices currently on the market are all designed to facilitate aerobic digestion by infusing oxygen into the manure pile or lagoon water. Besides producing less odor, aerobic bacteria offer additional advantages—they work 4 to 5 times faster than anaerobic bacteria and do not produce as much sludge.

When composting of solid manure and lagoon aeration are not viable options, one way to minimize odors is to apply manure and wastewater on fields regularly to keep stockpiles small and lagoon levels low. “When applying, keep in mind that air typically rises in the morning and early afternoon as the ground surface warms up” says Dr. Auverman. “As the air rises, it mixes in the atmosphere and odorous compounds are dispersed.” To minimize odors, land apply manure and lagoon water when the air is rising and winds are light.

Of course, before applying livestock waste to a field, the nutrient needs of the crop or pasture need to be balanced with the amount of waste applied. Laboratory tests of the soil, manure and wastewater, in conjunction with the yield goal of the crop, provide the necessary information to determine the appropriate amount to apply. To avoid runoff, land application of waste by-products should be avoided when rain or snow is likely.

By Philip Brink

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