

# FEEDLOT

## Dust Suppression & Cooling

*the original*  
**BIG GUN®**  
SPRINKLER

### Why choose a Nelson Big Gun®

- The Nelson name is synonymous with the best quality available.
- **Heavy-duty construction** ensures long wear life & reliability.
- **Greatest range of options.** Full & part-circle sprinklers available in a variety of trajectory, nozzle & coating options.
- **Valve combinations available** for maximum system efficiency.
- **Easy to operate, maintain and repair** with readily available parts and documentation.

### Advantages for Feedlot Applications

- Efficient dust suppression.
- Rapid cooling.
- Odor reduction.
- Improved animal health: respiratory distress reduction, heat stress reduction, increased stocking rates
- Enhanced work environment.

## IT'S THE ONE FOR THE JOB



Nelson Big Gun® sprinklers are ideal for feedlot dust suppression and cooling applications. With a full range of models available (see *The Original Big Gun®* brochure), flow rates of 30-1200 GPM (6.8-275 m<sup>3</sup>/hr) can be achieved with maximum uniformity to match a variety of needs. Uniformity of coverage is important to prevent standing water. Overwatering causes odor problems that can be more troublesome than dust.

With a variety of nozzles available, the irrigation system can be very flexible and easily controlled to allow for changes in the climate and seasons. Conditions of high temperatures and low humidity contribute to dustiness. Dust on the road is not so much of the problem — the harmful dust comes from the manure and can be optimally controlled by a combination of scraping up the manure and watering the remaining debris.

The EPA has developed a way to monitor feedlot dust concentrations. When the surface manure moisture content gets below 25%, dust is generated. The EPA standard for satisfactory conditions is a maximum of 250 micrograms per cubic meter. A moisture content of 31% is ideal to control dust, while a 45% moisture content leads to odor problems.



**BIG GUN®/  
VALVE COMBO**

## BIG GUN® SPRINKLERS for Feedlot Dust Suppression & Cooling



John M. Sweeten from Texas A&M University (in his article *Dust Emissions in Cattle Feedlots*) recommends that water application rates be adjusted according to weather conditions, animal size and manure depth. At the peak of the dry season there should be 5000 gallons of water per acre per day (46 m<sup>3</sup>/hectare/day) or 0.18 inches (4.6 mm) applied. Once a 25-35% moisture level is reached in the loose manure near the surface, water application rates should be 0.09 to 0.13 inches per day (2.3 to 3.3mm).

During dry periods a typical feedlot irrigation system could apply up to 2" (5 cm) of water per week, but the designer is encouraged to source local capacity information to meet the required/suggested

moisture levels. Water should be applied everywhere in the pen except for the feed bunker and a 10-12' (3 to 4 m) section (the apron) in front of the bunker; however, bunkers are sometimes watered to "freshen the feed". Nelson guns should be set up to rapid sequence in approximately 2 minute cycles, as much as 12 times per day. The ideal pressure for this sort of application is 80 psi (5.5 bar) and pressure regulating capabilities at each gun is important.

Along with dust suppression, cooling is a major benefit of feedlot irrigation. Livestock cooling increases feed consumption and reduces overheating. Reduction in respiratory distress improves animal health. Sequencing also tends to move the cattle up to the bunkers several times a day, promoting healthier eating habits.

### DESIGN CONSIDERATIONS

**Permanent sprinklers.** These units can be installed along the fence line or with protective risers inside of the pen. The automated valve/gun systems may initially be more expensive than tank trucks; the benefits of flexibility and operation have proven to be cost-effective over time. The ability to cycle across the lots and work with the wind conditions provides more management tools.

**Portable Big Gun Systems.** Big Guns mounted on tank units or moved along portable pipe systems are usually less expensive, but have the additional labor expense and in many cases higher operating expenses. The need to stay on a schedule to cover all of the lots can create some challenges for management. The design of the system starts with a complete mapping of the feedlot and projected expansions. The initial design needs to provide adequate water and pressure to each of the sprinkler sites. The need for uniformity cannot be overstressed at all stages of the design.

Decisions need to be made as to the method of management required. A very basic system of Big Guns or one with central controls and programming for sequencing are available. A benefit to the operation can be achieved by having the complete set of records available for when and how much water was applied with the system. By designing the system with the proper design software, such as Nelson Irrigation Corporation Irricad, the system hydraulics can be balanced to handle multiple zones.

Careful consideration needs to be given to riser construction and mainline installation due to the mining effect noted in long term operations. Flushing and drainage for winter shut down need to be one of the initial design parameters to prevent freezing damage.

**WARRANTY AND DISCLAIMER:** Nelson Big Gun® Sprinklers are warranted for one year from date of original sale to be free of defective materials and workmanship when used within the working specifications for which the products were designed and under normal use and service. The manufacturer assumes no responsibility for installation, removal or unauthorized repair of defective parts. The manufacturer's liability under this warranty is limited solely to replacement or repair of defective parts and the manufacturer will not be liable for any crop or other consequential damages resulting from defects or breach of warranty. THIS WARRANTY IS EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR PARTICULAR PURPOSES AND OF ALL OTHER OBLIGATIONS OR LIABILITIES OF MANUFACTURER. No agent, employee or representative of the manufacturer has authority to waive, alter or add to the provisions of this warranty, nor to make any representations or warranty not contained herein.

This product may be covered by one or more of the following U.S. Patent Nos. 3,744,720, 3,559,887 and other U.S. Patents pending or corresponding issued or pending foreign patents.



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