Forage Research Update

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WISCONSIN - Density in Silage Storage

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Adapted from Proc. Silage for Dairy Farms: Growing, Harvesting, Storing, and Feeding. 2006. NRAES-181.

As forage compacts in a silo, air is forced out so there is less oxygen within the forage to support aerobic microbial activity. Aerobic microbes break down sugars (dry matter) to carbon dioxide and water and release heat. When forage is packed densely and the feed-out surface is kept smooth and relatively undisturbed, oxygen penetration is minimized, limiting dry matter losses and heating during silage fermentation and feed-out.

Some summary points based on research and field testings:

- Dry matter loss increases as silage density decreases.
- Actively packing bunker/pile silos increases silage density.
- Many farmers are not achieving the recommended minimum silage density. Check silage density and adjust packing procedures if needed.
- The rate of forage push-up and packing must be increased as harvest rate increases to assure adequate packing.
- Increasing packing tractor weight increases silage density.
- Increasing the number of packing tractor passes over the forage increases silage density. More tractor passes requires more packing time per ton.
- Increasing packing passes near bunker silo walls may be needed to increase density in that area of the silo.
- Extra packing effort (more tractor weight, packing time per ton, etc.) may be needed on top layers of the forage to increase density in those layers most exposed to oxygen.
- Density in silo bags is lowest next to the sides and top. Plastic integrity needs to be maintained to minimize dry matter loss.
- Density in silage bags depends on the setup of the bagging machine, so it is important to learn how to achieve good densities while maintaining a smooth bag appearance.
- Long particle size adversely affects bag densities