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Reconditioning In-Bin Soybeans

At harvest report there were several reports of very dry soybeans. Soybeans in the 8-9% moisture range equates to around 2 bushel of lost weight in a 40bu/acre crop. At \$11-12/bushel, that is around \$20-24/ acre in lost moisture. Adding water to soybeans to increase their moisture is illegal. Producers can boost the moisture content by aerating the beans with humid air, provided they have enough time and a high enough airflow per bushel.

If a bin of soybeans is aerated continuously, the beans lose moisture during periods of low humidity and gain moisture when the humidity is high. Producers would need to make sure to operate aeration fans during weather with an average relative humidity of about 70% if they want to recondition soybeans to 13% during normal fall temperatures of 30-60 degrees F.

The moisture doesn't change throughout the bin during reconditioning. Instead a rewetting zone develops and moves slowly through the bin in the direction of the airflow. In most cases, fall weather doesn't provide enough hours of high humidity to move the rewetting zone through the bin. Soybeans in part of the bin could be too wet to be stored safely. Bins equipped with stirring augers would be best to mix the wet layers with the dry layers to reduce the possibility of spoilage or drying charges. Emptying the bin and moving the beans through a grain handling system will provide limited mixing.

In soybeans with moisture contents of 10% or less, controlling the aeration fan so it runs only when the relative humidity of the air reaching the beans is greater than 55% should result in rewetting. One method to accomplish this is to use a humidistat to turn the fan on any time the humidity is above 55%. Another option is to run the fan only at night when humidity is almost always higher.

Producers who aren't equipped to mix the soybeans after reconditioning need to avoid wetting the beans to moisture levels at which they are unsafe to be stored. This can be accomplished by (1) add a second humidistat that stops the fan when the relative humidity reaches very high levels. or (2) installing a microprocessor-based controller that monitors temperature and humidity, and runs only when air conditions will bring the crop to the desired moisture content.

Reconditioning time primarily depends on the airflow per bushel and weather conditions. Reconditioning occurs fastest when the airflow is high and the air is warm and humid. It will be most successful in a drying bin that has a fully perforated floor and a fan that can deliver at least 0.75 cubic ft./minute of airflow/bushel. Even with ideal conditions it could take at least a month of fan operation to move the rewetting front all the way through the bin.

One other concern is that beans swell when they absorb moisture. This could create pressure on the bin walls. One option to reduce possible pressure is to use a vertical stirring auger to mix layers of wet and dry beans. Another option is to periodically unload some beans from the bin.

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