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Using Farm Moisture Testers

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Accurate moisture tests are important in managing and marketing grain. Inaccurate tests can lead to:

- spoilage if grain is too wet and is placed in low-temperature (air heated less than 10°F) or natural-air drying bins
- extra drying cost and combine loss if grain harvested is wetter than necessary
- moisture shrinkage and drying charges when grain is sold too wet
- extra drying cost and loss of value (about 5¢/bu./point for $2.50/bu. corn) when grain is dried below the market standard
- spoilage when grain is stored too wet

To make accurate moisture tests, first obtain a representative grain sample, then use your tester properly.

Note: Farm moisture testers operate on the same electronic principle as elevator meters, but they cost much less and normally are somewhat less accurate.

Sampling

Obtaining a representative grain sample before harvest is difficult. Moisture content of standing corn is often underestimated. For combine-harvested grain, it is probably best to harvest a small area and then sample the shelled grain. If this isn't practical, hand pick and shell ears from several plants and mix the grain together. Make three moisture tests on this sample, and average the results. Add three to four points to this number.

When sampling a loaded vehicle of any grain, probe the load in at least two locations (avoid center and corners) or, better yet, sample the flowing grain during unloading. Pass an open container completely across the grain stream every 50 bushels or so, and pour the collected grain into a bucket. When the vehicle is empty, mix the grain in the bucket and draw out the amount required for a moisture test. Keep the bucket covered if the grain won't be tested immediately. Be sure the grain is thoroughly mixed; scooping a can-full of grain off the top of a load is not adequate.

When checking moisture of binned grain, use a 6- or 10-foot probe to collect samples from various depths (go as deep as possible) at bin center and several other locations. Do not mix the samples. Knowing moisture content at different locations can help you find the drying front in drying bins or trouble spots in storage bins. If you don't have a probe, at least take some samples at arm's length below the surface.

Be careful when entering bins. Crusted grain can cave in unexpectedly. Never enter a bin being filled or emptied. Wear a dust mask, especially if any spoilage is evident.

Using your tester

If you have a portable moisture tester, first make sure the battery is good. A low battery causes inaccurate readings. Don't take chances: replace it at least once a year. Remove the battery during the tester's long, idle periods to prevent damage from leakage.

Next, carefully follow the manufacturer's instructions. Pay particular attention to the tester's temperature compensation method; grain temperature can have a large effect on

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moisture readings. Cold grain temperatures generally cause low readings, unless moisture has condensed on the surface. Some testers have automatic temperature compensation, some compensate after you push a button, and others require you to measure grain temperature, then add or subtract a correction factor to the moisture reading.

Be aware that cold grain with condensed surface moisture produces erroneously high readings in electronic testers. Moisture condensation occurs when cold grain is removed from storage on a warm, humid day, or when cold samples are taken into a warm, humid room. Allow cold grain to warm in a sealed container before making moisture tests. Warm grain by aerating it before selling in warm weather.

Moisture testing hot corn from a dryer is difficult as well. Electronic testers understate the moisture content of hot or rapidly-cooled grain that has not reached internal moisture equilibrium. Grain also loses moisture as it cools. To get the actual moisture content of hot grain, let it cool slowly in a sealed container before testing it. If you want the final, after-cooling moisture content, cool hot samples in open containers, or wait one to two hours after cooling and then take samples.

All moisture testers show some variability; different readings are obtained when the same sample is tested repeatedly. To limit this effect, test each sample at least three times and average the readings.

Checking accuracy

Because elevator moisture testers are inspected twice a year by the Iowa Department of Agriculture, you can use them to check your tester's accuracy. Do this yearly.

Compare readings from your tester with readings from an elevator tester for several grain samples at several moisture levels. For corn, use three samples of about 15 percent moisture and three samples in the 20 to 25 percent moisture range. If you test samples at home and then transport them to the elevator, keep the grain in sealed containers and do both tests within a few hours. Expect erratic readings for corn above 25 percent moisture.

Test each sample three times in your tester and calculate the average reading. Repeat this process in the elevator's tester. If the difference between average readings from the two testers for any single sample is greater than 1.0 point for dry grain or 1.5 points for wet grain, or if the average difference for all samples is greater than 0.5 point for dry grain or 1.0 point for wet grain, have your tester serviced. A short-term alternative to actual service is to test five to 10 more samples to determine if the difference among the readings is consistent (within ± 0.5 percentage point). If there is a consistent difference, you can compensate for your tester's inaccuracy by adding or subtracting the appropriate percentage to your readings. If your meter is inconsistent, however, there is little you can do except have it serviced.

Summary

It is important to know your grain's moisture content. To get reliable moisture readings, obtain representative grain samples, use your tester properly, and annually check you tester's accuracy.

Revised by Charles R. Hurburgh, extension agricultural and biosystems engineer. Formerly published as AE-3024, written by Hurburgh and W. F. Wilcke.

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