

Koster Forage Moisture Tester

The Koster forage moisture tester works on a principle similar to that of an oven. A forage sample is dried and the moisture content is determined from the weight change. The tester consists of a drying unit containing an electrical heating element and a fan, a sample container, and a scale (Figure 1). Heated air is forced upward through the sample, evaporating the water in the sample. The system is easy to use and fairly rapid, requiring about 30 minutes of drying for most samples. The tester can operate well in protected areas outdoors, but must be used near a 110-volt electrical outlet. The Koster tester can be used for samples with 20-90 percent moisture content.

Method

1. Read the instruction card included with the tester.
2. Set the weigh scale on a flat surface and level it by adjusting the screws, using the level indicator on the side of the scale. Select a location with very little wind but enough ventilation to carry away the heat generated by the drying unit.
3. Place the empty sample container on the scale. Adjust the scale pointer to read 100 percent on the black scale. A thumbscrew underneath the scale platform is used to adjust the scale pointer.
4. Add the sample to be tested to the sample container until the pointer reads 0 percent on the black scale. Use about 2 lbs of chopped forage. Unchopped forage should be hand chopped with a paper cutter, scissors, or hedge trimmers.
5. Place the sample container on the drying unit. Run the drying unit for 20-25 minutes.
6. Remove the sample container and place it on the scale. The percent moisture content can be read directly on the black scale. The percent dry Koster Forage Moisture Tester matter (100 minus percent moisture) can be read directly on the red scale.
7. Place the sample container back on the drying unit and run for 5 minutes. Again, weigh the container as described above. Repeat this sequence until there is no further change in the scale reading.

Accuracy

The accuracy and repeatability of the Koster tester were evaluated by the Prairie Agricultural Machinery Institute in 1981. Samples used in that test were chopped alfalfa and chopped corn. Moisture content of these samples ranged from 20-76 percent. Results from the Koster tester were compared with those from conventional oven-drying. For alfalfa, moisture readings were accurate at about 40 percent moisture, and were slightly low at higher moisture. A similar trend was found for corn, but with greatest accuracy at 50 percent moisture. Overall, moisture readings were within ± 3 percentage points when compared to conventional oven drying. When four samples of each of each forage were tested and the results averaged, the average moisture readings were within ± 2 percentage points of the oven values. For this reason, the test engineers recommended that several samples of the same forage be tested for greatest accuracy.

The variation in readings from the Koster tester, after correcting for the actual variations in moisture content (as determined by oven drying), was 1.0 percent for corn and 1.1 percent for alfalfa. These low figures indicate excellent repeatability, yielding moisture content readings within about 1 percent of each other for the same forage.

Safety

The Koster tester is an electrical device which operates on 110-120 volts alternating current. Follow normal precautions for using electrical appliances. The sides of the Koster tester become very hot during drying and could cause severe burns. The tester should be set away from flammable materials and should not be left unattended while it is on. Overdrying can burn or char the sample, resulting in inaccurate (high) moisture readings.

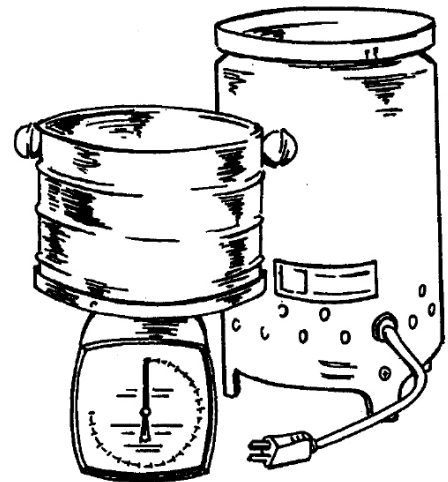


Figure 1. Koster forage moisture tester