

# There's a correct way to rake and merge hay

**R**AKING hay seems like such a simple thing, yet often mistakes are made that cost time, money, yield and quality.

The first important principle is to not rake or ted hay that is less than 40% to 50% moisture. As the graph shows, alfalfa dry matter losses begin to exceed 10% when hay is handled at less than 40% moisture. This principle is often overlooked because the losses don't seem that great. But now with hay costing \$150 per ton, you could easily be losing \$15 per ton harvested simply by raking the hay when it's too dry.

The next key principle is to keep the windrow off the ground. The windrow obviously dries more slowly and less uniformly if it is touching the ground because air cannot circulate underneath; thus, hay absorbs water from wet soil.

The best way to keep the windrow off the ground is to start with a wide swath after mowing so the stubble can support the weight of the hay.



**Focus on Forages**  
By DAN UNDERSANDER

Starting with a wide swath (70% or more of the cut area) will enhance early drying to reduce starch and sugar loss to respiration (total digestible nutrients, or TDN, loss) and will generally reduce drying time for hay or haylage by one day.

Tedding is often considered to enhance drying. This is an important tool for grass hay, but not legume hay.

Grasses tend to dry into a mat (especially after first cutting when stems are few). This mat needs to be broken up to enhance drying. Therefore, grass hay fields generally dry best if tilled once after mowing and then raked into a windrow at 40% moisture. Grasses lose few leaves from the tedding process, so little dry matter or forage quality is lost, but drying is enhanced.

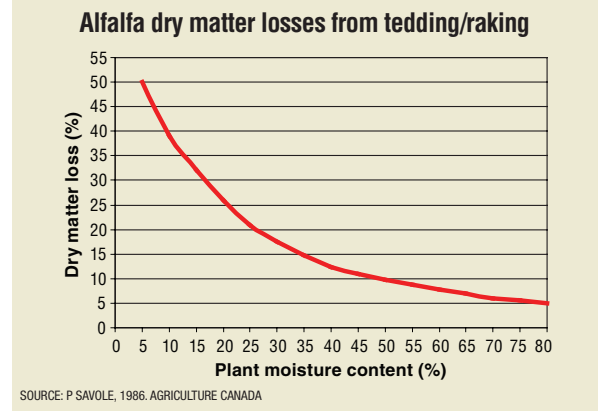
However, tedding is not a recommended practice for alfalfa. It is unnecessary if starting with

a wide swath. Note that tedding a windrow can enhance drying by four to six hours, but a wide swath will reduce drying time by a day. Tedding will cause significant leaf loss, resulting in loss of both tonnage and forage quality.

Similarly, a windrow inverter is marginally beneficial and seldom economical. Data suggest that a windrow inverter may enhance drying time by two to four hours (assuming one started with a windrow rather than a wide swath), but again, this enhanced drying is far less than simply starting with a wide swath.

### Tines shouldn't touch

When raking, be sure the tines touch the ground the minimum necessary to move the forage into a windrow. If hay is truly on the stubble, you should be able to rake without tines touching the ground. This is best because no stones or soil are moved into the windrow. Adding soil to the hay or haylage increases forage ash content. Each 1% soil con-



SOURCE: P. SAVOLE, 1986. AGRICULTURE CANADA

tamination decreases forage TDN by about 1%. When you see your neighbor raking hay in a cloud of dust, consider that they are losing more than 10% forage dry matter and adding 1% to 2% soil (ash) to the hay.

You can check a forage analysis to see how much soil is being added to your forage since we know grass contains about 6% ash and alfalfa about 8% ash. Anything above this is soil contamination. You should aim to harvest forage with less than 10% total ash.

If you have a wheel rake, tines must touch the ground, but adjust the float so minimum ground contact occurs to turn the wheels. If buying a rake, consider a rotary model so hay can be raked without tines

scraping the ground.

A merger will put hay or haylage into a windrow with the least leaf loss (and therefore quality loss) and the least addition of stones and soil. However, a merger is generally more expensive than a rake and may not be cost-effective unless used on large acreages. Contract harvesters often use mergers rather than rakes.

Generally, the most cost-effective forage harvesting is to rake/merge windrows into the largest windrow your harvesting equipment can manage. This minimizes wheel traffic on the field at harvest and reduces labor and energy of harvest.

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