

Cattle Producer's Handbook

Range and Pasture Section

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Management to Minimize Hay Waste

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Hay is harvested, stored, and fed under a wide variety of conditions that influence both its yield and quality. Harvest and storage involve both dry matter and nutritive value loss. These losses occur in all phases of getting the hay from the field to the livestock — harvest, storage, and feeding.

Harvest

After cutting, forage plant cells respire until their moisture content falls below 35 to 40 percent. Hay dries rapidly on a warm, dry, breezy day resulting in dry matter losses to respiration of only 2 to 6 percent. If hay dries slowly, however, dry matter losses to respiration can be as high as 15 percent. This can happen when hay is rained on soon after cutting or when soil moisture and humidity levels are high. Overnight losses from hay cut in late evening can be as high as 11 percent.

Respiration loss is due primarily to the breakdown of soluble carbohydrates, which are roughly 100 percent digestible. Therefore, such losses will substantially reduce hay quality.

Losses during curing cannot be eliminated, but cutting hay when good drying weather is expected will reduce respiration losses considerably. Once the moisture content of hay falls below 35 to 40 percent, most harvest losses are caused by weathering and handling. Weathering losses increase with the number of rain showers, amount of rain, and dryness of the hay. Leaching can cause yield losses as high as 20 percent.

Most of the lost nutrients are highly digestible solubles (carbohydrates, proteins, B vitamins, and some soluble minerals, such as potassium). Rain not only leaches nutrients, it can also increase leaf loss because of the extra handling needed to dry the hay. Leaves are the most valuable part of the hay since they have the highest quality. Therefore, losing leaves will decrease hay quality.

Leaf shatter, especially from legumes, can be serious at harvest time. Leaf loss can be minimized by reducing the number of times hay is handled in the field and by handling hay at high-moisture levels. Leaf loss is often 5 to 10 percent greater when hay is cut, conditioned, and raked separately than when all three operations are done at one time.

Alfalfa hay that is raked and packaged very dry can yield 35 percent less dry matter and be of poorer quality than properly handled hay. Producers should rake legume hay at a moisture content greater than 50 percent. Results of raking alfalfa hay at various moisture levels are shown in Fig. 1.

Windrower machines eliminate raking and thus the leaf loss that is caused by raking. Because drying takes longer in the windrow than in the swath, respiration

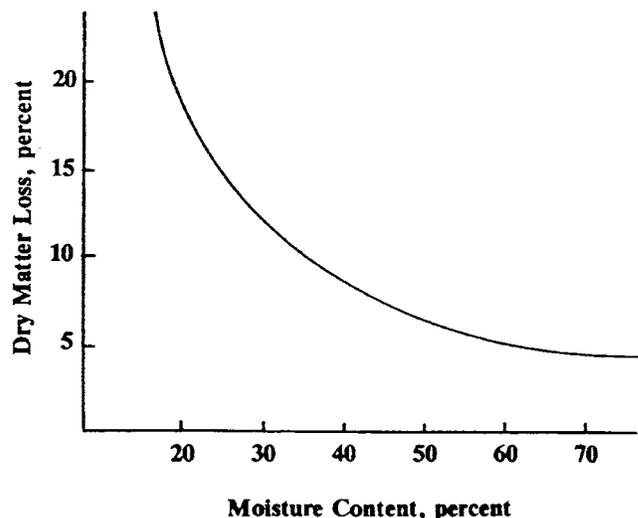


Fig. 1. Losses in alfalfa as influenced by moisture content when raked.¹

¹From Hundtolf, E. B. 1965. Cornell Univ. Ag Engineering Ext. Bull. 364. Ithaca, NY.