

When Should I Harvest Alfalfa

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The prime objective in determining when to harvest is to obtain prime hay in the bale. This is especially true for cash hay producers and dairy operations where prime hay means greater net returns for the alfalfa crop, but it can be important for beef cow producers also as a source of high-quality high-protein hay to be used in rations with other low-quality hays like mature grasses or slough hay.

Many factors enter into the decision of when to harvest alfalfa such as environmental conditions, other field work, insect infestations, etc. But what factor(s) should be used to determine when to harvest if these are not determining factors?

Plant maturity or calendar date has been used extensively to determine the optimum time to harvest, but I believe plant height is more important in determining when to harvest than plant maturity and especially calendar date. The growing season changes the optimum time to take the first cutting. If the spring is late and the temperature average to below average, high-quality hay can be obtained by harvesting alfalfa at a later maturity stage, late-bud to early bloom, like in 2008 in the Red River Valley of the North when harvest started on June 16. But if the spring is early and above-normal temperature, the optimum harvest stage will be earlier like in 2002 when first harvest was taken on May 24.

Plant height is the best indicator of when to take the first harvest ([Table 1](#)). Note that the relative feed value (RFV) (relative forage quality (RFQ) would produce a similar table) decreased from 220 to 149 as the plant height increased from 16 to 35 inches when all samples were taken at the early bud stage. A similar effect was seen at the early flower stage. Also note that the loss in RFV was much less when the maturity stage increased from early bud to early flower within a given height.

At Fargo, we have found that harvest should begin whenever the alfalfa reaches around 28 inches in height, regardless of the maturity stage, if prime hay in the bale is desired. The estimated RFV in Table 1 is for alfalfa standing in the field. Be sure to allow about 25 to 30 units of RFV for harvesting losses; therefore, harvest needs to occur by 175 to 180 RFV. The best method to estimate the RFV or RFQ in the first harvest is to utilize a PEAQ stick available for purchase from the Midwest Forage Association.

Table 1 also illustrates why harvest at early flower during the first harvest would be recommended when growth is less than 20 inches in height. Therefore, under drought when growth is reduced, waiting for a more advanced maturity stage to allow increased production would be a wise management strategy. But waiting for increased yield when growth is good leads to poor-quality hay. By harvesting early under good growing conditions, there is increased opportunity for an additional harvest that more than offsets the yield loss in the first harvest by harvesting early.

Fields generally have varying maturity and height, especially in second and later harvests. Frequently hilltops have less growth and are more advanced in maturity than

lower wetter areas of the field. Base your decision when to harvest on the valleys realizing that the short growth and more advanced maturity on the hilltops will not affect the quality extensively.

Second and third harvests usually generally are shorter in height than the first harvest. Therefore, the optimum maturity stage at harvest will be more advanced than the first harvest. We have found that under a four-cut system, the maturity at harvest generally is mid to late bud and occasionally 80% bloom (under drought stress) in the second harvest and 10 to 20% bloom in the third harvest or later under drought stress. Again, maturity at harvest varies depending on the year and moisture level so it's best to use height to help decide when to harvest. For example, in 2006 the second harvest at 10% bloom had a RFV of 193 and the third harvest at 30% bloom had 250 RFV. Both of these harvests were under drought stress and plant height was only 10 to 12 inches in the third harvest. We should have delayed the third harvest to obtain additional yield in this case.

Once you decide it is time to harvest, consideration should be given to time of day for harvest. Research has shown that harvesting in late afternoon or early evening produces a forage with a higher total nonstructural carbohydrate content than one harvested in the morning due to the current day's photosynthesis. Higher carbohydrate levels increases digestibility and animal acceptability, which should result in improved animal performance.

In summary, plant height is the best indicator to use in determining when to harvest, especially in the first harvest, but also in later harvests. Use of the PEAQ stick will help you make the decision as to when to harvest. Harvest in the late afternoon or evening to increase the carbohydrate content and increase the quality of harvested hay.

Table 1. Estimated RFV by plant height at two maturity stages.		
Plant height	Early bud	Early flower
Inches	-----RFV-----	
16	220	196
20	201	181
25	181	163
30	164	148
35	149	135