

STUBBLE HEIGHT EFFECTS IN ALFALFA

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Leaving 3-5" stubble height during harvest is very common due to rocks, pocket gophers or crop lodging. But what is the impact of stubble height on the yield and quality of alfalfa? It is surprising how much increasing stubble height reduces forage yield.

Stubble height effects were evaluated in Fargo (dryland) and Carrington (irrigated), ND, 1999-2001. Forage yield averaged across three varieties, three years, two cutting systems (3 and 4 annual cuts), and two locations, was reduced 0.95 tons/acre for each 2" of stubble left in the field (see table). That's a 15% reduction in forage yield for 2" of stubble left in the field or 30% for leaving a 5" stubble.

Harvesting at a 5" stubble height increases the hay forage quality compared to lower heights (see table). Relative feed value (RFV) of the hay was increased 31, 30, 26 and 23 units in the first, second, third and fourth harvests, respectively, when harvested at 5" compared with 1". Likewise, crude protein (CP) was increased 2.2, 2.6, 1.4 and 3.2% in the first, second, third and fourth harvests. The lower stem (lowest 4") is very poor in forage quality, averaging only 10.1% CP, 51.3% acid detergent fiber (ADF), 61.5% neutral detergent fiber (NDF), and a RFV of 71 in the fourth harvest, while the hay averaged 17.0% CP, 30.5% ADF, 38.5% NDF, and 159 RFV.

Each producer must weigh the advantages of yield, forage quality, harvesting efficiency, overwintering ability and economics when deciding what stubble height to harvest the alfalfa. Cash hay and dairy producers receive a premium for high quality, so leaving some stubble in the field to increase quality might be justified if harvest is delayed by rain. Some say it is better to harvest at a maturity where the lowest stubble height will produce prime hay, rather than

sacrifice yield potential. In many cases, the premium price received will not offset the 30% reduction in yield. Beef cow producers should always harvest as low as possible since forage quality of alfalfa is greater than that needed by cows.

Regrowth rate following harvest was not affected by stubble height. Canopy height before harvest was similar among stubble heights, but the percentage of stems originating for remaining residue increased with stubble height. Overwintering of the four-cut system was slightly better in the 5" than 1" stands in 2000-01 winter when injury was noted, but forage yields were still higher at 1" than 5". Harvesting at the 1" height will increase the forage ash content from soil contamination, especially with some of the flail-type harvesters.

Alfalfa stubble height has a great impact on forage yield/quality and should be considered in management packages. More effort on pocket gopher control is warranted. Removal of rocks prior to seeding or rolling to push rocks back into the ground in established stands is also warranted.

