

Estimating Alfalfa Fiber Content in the Field

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Storing high quality alfalfa does not happen by accident. While weather conditions can greatly affect the ability to store high quality forage, harvest timing and management are under the control of the manager. Unfortunately, harvest management decisions are usually made without any quantitative knowledge of the chemical composition of the forage.

Estimating forage quality in the field can help producers make decisions regarding harvest timing, storage, and forage inventory management. Any pre-harvest method of estimating forage nutritive value must be quick, inexpensive, easy use, and provide reasonably accurate results that are consistent across a wide range of environments and cuttings.

Alfalfa neutral detergent fiber (NDF) can be estimated in the field using a system based on the height of the crop and its maturity stage (see next page). Basing harvest timing primarily on maturity stage of alfalfa can be misleading. Often under cool spring conditions, the alfalfa crop does not develop buds and flowers as normal, yet fiber continues to accumulate. In contrast, under hotter and drier conditions, blooming alfalfa may still be of high quality.

Using the system described on the next page, the estimated NDF was within 3 units of the wet chemistry NDF for 77% of more than 500 samples tested. This method was consistent across a wide range of environments in the Midwest and can be used during the entire growing season, not just on the first crop. So it provides a reasonably accurate guide for timing alfalfa harvests according to your forage quality goals all season long. It works only in pure stands of alfalfa and is most accurate under normal growing conditions.



Figure 1. Alfalfa in early bud stage (left) and flower stage (right).

Step 1: Choose a representative 2-square-ft area in the field to be harvested.

Step 2: Determine the most mature stem in the 2-square-ft sampling area. Vegetative = no buds or flowers present; Bud=1 or more nodes with buds; flower=1 or more nodes with open flowers.

Step 3: Measure the length of the tallest stem in the 2-square-ft area. Measure it from the soil surface (next to plant crown) to the tip of the stem (NOT to the tip of the highest leaf blade). Straighten the stem for an accurate measure of its length. The tallest stem may not be the most mature stem.

Step 4: Based on the most mature stem and length of the tallest stem, use the chart to determine estimated NDF of the standing alfalfa forage.
Example: tallest stem is 28 inches, most mature stem has buds, but no open flowers; NDF = 38.0.

Step 5: Repeat steps 1-4 in five representative areas across the field. Sample more in fields larger than 30 acres. Average all estimates for a field average.

NOTE: This estimates alfalfa NDF of the standing crop. It does not account for changes in quality from wilting, harvesting, and storage, which may further raise NDF by 3 to 6 units, assuming good wilting and harvesting conditions. This procedure is most accurate for good stands of pure alfalfa with healthy growth.

Length of tallest stem inches	Most mature stem present		
	Vegetative	Bud	Flower
	----- % NDF -----		
16	28.5	29.7	31.4
17	29.2	30.4	32.0
18	29.9	31.1	32.7
19	30.6	31.8	33.4
20	31.3	32.5	34.1
21	32.0	33.2	34.8
22	32.7	33.9	35.5
23	33.4	34.6	36.2
24	34.0	35.3	36.9
25	34.7	35.9	37.6
26	35.4	36.6	38.3
27	36.1	37.3	38.9
28	36.8	38.0	39.6
29	37.5	38.7	40.3
30	38.2	39.4	41.0
31	38.9	40.1	41.7
32	39.6	40.8	42.4
33	40.3	41.5	43.1
34	40.9	42.2	43.8
35	41.6	42.8	44.5
36	42.3	43.5	45.2
37	43.0	44.2	45.8
38	43.7	44.9	46.5
39	44.4	45.6	47.2
40	45.1	46.3	47.9

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