



Comparing Grass Cultivars in the Spring

The number of cool-season perennial grass cultivars has increased dramatically in recent years. There are over 100 certified forage-type tall fescue cultivars. Perennial grass cultivars have been selected for persistence and increased yield, as well as increased palatability and reduced anti-quality components. An effective method is needed to compare these cultivars for both yield and quality.

Currently for grass cultivar trials, all entries in a trial are harvested on the same day, regardless of maturity, or an attempt is made to harvest entries at a similar maturity stage. It is difficult to make cultivar comparisons using either of these methods. Same-day harvesting of cultivars is biased by plant maturity differences. Harvesting on different days to correct for plant maturity is biased by the environmental conditions preceding each harvest date.

Normally forage NDF increases steadily in the spring, but it is possible for forage NDF to temporarily drop as much as 5 percentage units due to a stretch of cold weather. Harvest on different days cannot take weather shifts into account. Adjusting yield and quality for plant maturity (heading date) is not satisfactory, as the relationship between heading date and both yield and quality for a set of cultivars is relatively poor (Fig. 1 & 2).

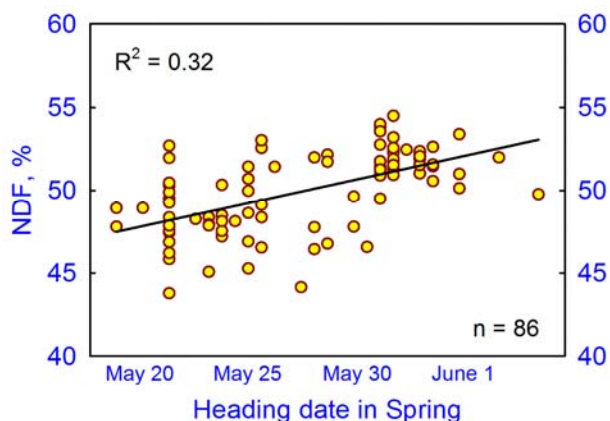


Figure 1. Relationship between heading date and NDF at spring harvest for 43 tall fescue cultivars at two sites.

There is a method to compare yield and digestibility of entries in the spring cut on the same day, by adjusting yield and digestibility to the same NDF level. This can be accomplished by determining the linear rate of change of yield and quality over time. While rates of change vary slightly among cultivars, an average rate of change over time for yield or quality adequately represents all cultivars in a trial. Duplicate plots of a 3-4 representative cultivars are established in a trial for sampling on 4-5 different dates to get rates of change.

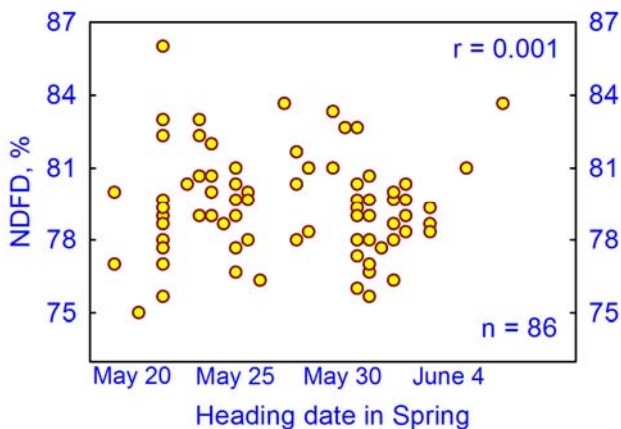


Figure 2. Relationship between heading date and NDFD at spring harvest for 43 tall fescue cultivars at two sites.

Table 1. Ranking of 45 entries of tall fescue for dry matter yield (DMY) at spring harvest. Yield adjusted to date of 48% NDF for each entry (aDMY). The shift in ranking for a few entries are highlighted.

Rank	Trial Means		Adjusted Means	
	Entry	DMY tons/a	Entry	aDMY tons/a
1	10	1.61	10	1.85
2	7	1.60	45	1.64
3	5	1.57	12	1.61
4	3	1.55	4	1.60
5	33	1.54	6	1.58
6	37	1.54	37	1.54
7	6	1.51	42	1.48
8	8	1.49	14	1.46
9	4	1.46	33	1.45
10	12	1.44	5	1.43
11	16	1.38	36	1.40
12	36	1.36	17	1.39
13	21	1.34	7	1.34
14	17	1.32	2	1.32
15	25	1.31	32	1.31
16	13	1.31	22	1.30
17	32	1.31	39	1.29
18	26	1.30	43	1.28
19	15	1.28	1	1.28
20	41	1.26	13	1.28
21	29	1.24	29	1.27
22	2	1.22	21	1.26
23	44	1.21	15	1.26
24	1	1.20	35	1.23
25	38	1.20	24	1.22
26	27	1.19	16	1.17
27	35	1.18	3	1.16
28	45	1.18	38	1.15
29	30	1.18	41	1.15
30	14	1.16	19	1.14
31	42	1.16	26	1.12
32	40	1.15	30	1.10
33	39	1.15	20	1.07
34	19	1.13	28	1.05
35	22	1.13	23	1.05
36	31	1.12	18	1.03
37	43	1.07	8	1.02
38	24	1.04	34	1.02
39	20	1.03	11	1.01
40	11	1.02	9	0.98
41	23	1.01	40	0.97
42	18	1.00	27	0.96
43	9	0.99	31	0.90
44	34	0.87	44	0.87
45	28	0.63	25	0.85

Trial NDFD means vs. adjusted NDFD means are not shown in Table 1, but they also change significantly in ranking after adjustment. Ranking grass cultivars for milk/acre is virtually identical to ranking them for dry matter yield/acre. This system places more emphasis on quality and results in significantly different cultivar rankings, compared to unadjusted yield and fiber digestibility.

The single best quality comparison under this system is to compare fiber digestibilities adjusted to a common neutral detergent fiber (NDF). The best method of combining yield and quality into one term is to rank dry matter yields of cultivars that are adjusted to the date of a common NDF value. This NDF value would typically be the average NDF of a cultivar trial.

Summary

Spring growth constitutes a majority of the forage from a grass stand suitable for lactating dairy cows, assuming a 3-cut management system. Assessment of yield and quality would be helpful for selection of a cultivar, but same day harvest of a set of entries is biased. Using rates of change of yield and NDFD to adjust yield and NDFD, to the date of optimum NDF for each cultivar, significantly changes the relative ranking of a group of cultivars. All entries are evaluated for yield and NDFD at an optimum NDF level for harvest.

Additional Resources

- 2011 Cornell Guide for Integrated Field Crops Management. Electronically accessible at: <http://ipmguidelines.org/Fieldcrops/>.
- Cherney, J.H., D. Parsons, and D.J.R. Cherney. 2011. A method for forage yield and quality assessment of tall fescue cultivars in the spring. *Crop Sci.* 51: (in press).

Disclaimer

This information sheet reflects the current (and past) authors' best effort to interpret a complex body of scientific research, and to translate this into practical management options. Following the guidance provided in this information sheet does not assure compliance with any applicable law, rule, regulation or standard, or the achievement of particular discharge levels from agricultural land.

For more information



Cornell University
Cooperative Extension

Grass Management Manual
<http://forages.org>

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