GROWTH AND DEVELOPMENT OF ALFALFA OF DIFFERING DORMANCY

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FALL DORMANCY

- Definition: Reduction in stem growth in the fall due to daylength and temperature
- Not necessarily related to winterkill
- Effect lasts until spring
- Dormancy of some type occurs in most perennial plants (eg. bermudagrass, fruit trees)

FALL DORMANCY RATINGS

Rating	Modifier	Description
1	Extremely	Dormant
2	Very	Dormant
3		Dormant
4	Moderately	Dormant
5	Moderately	Semi-dormant
6		Semi-dormant
7	Moderately	Nondormant
8		Nondormant
9	Very	Nondormant
10	Extremely	Nondormant

ALFALFA VARIETY HISTORY IN ARIZONA

Variety	Year	Dormancy	Notes
AZ Common (from Chile)	Mid-1800s	8	From CA Gold Rush
Hairy Peruvian	1899	8	First "improved" variety
Lohantan	1954	5	Stem nematode resistance
Moapa	1969	8	Spotted alfalfa aphid resistance
CUF 101	1977	9	Blue alfalfa aphid resistance
Various varieties	1980s on	9	Pest resistance, salt, glyposate, low lignin
Various varieties	2000s	10	Beginning of trend
Arabian germplasm	2000s	11-12	Frequent hand cutting at oases

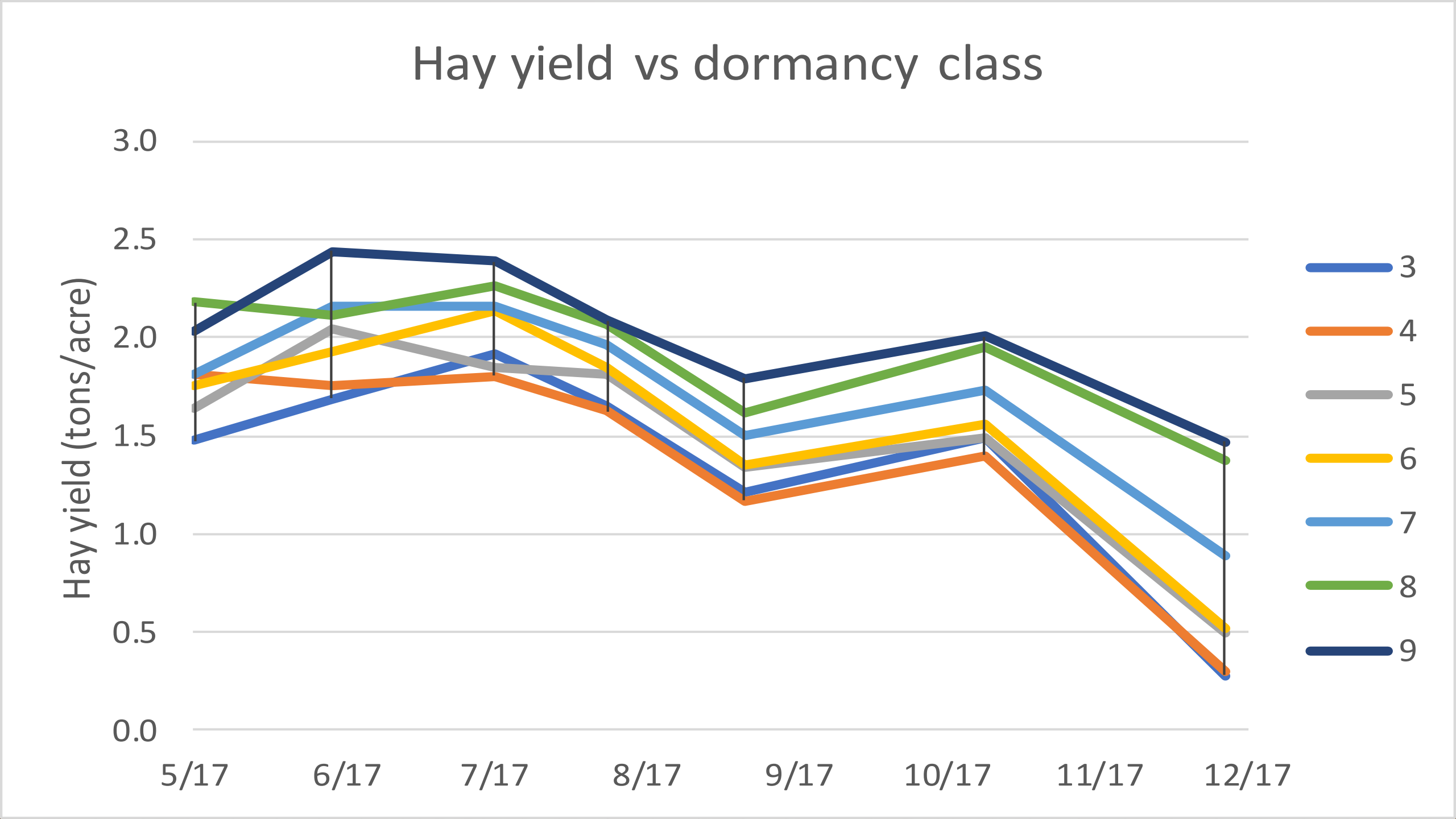
ALFALFA GROWTH STAGES

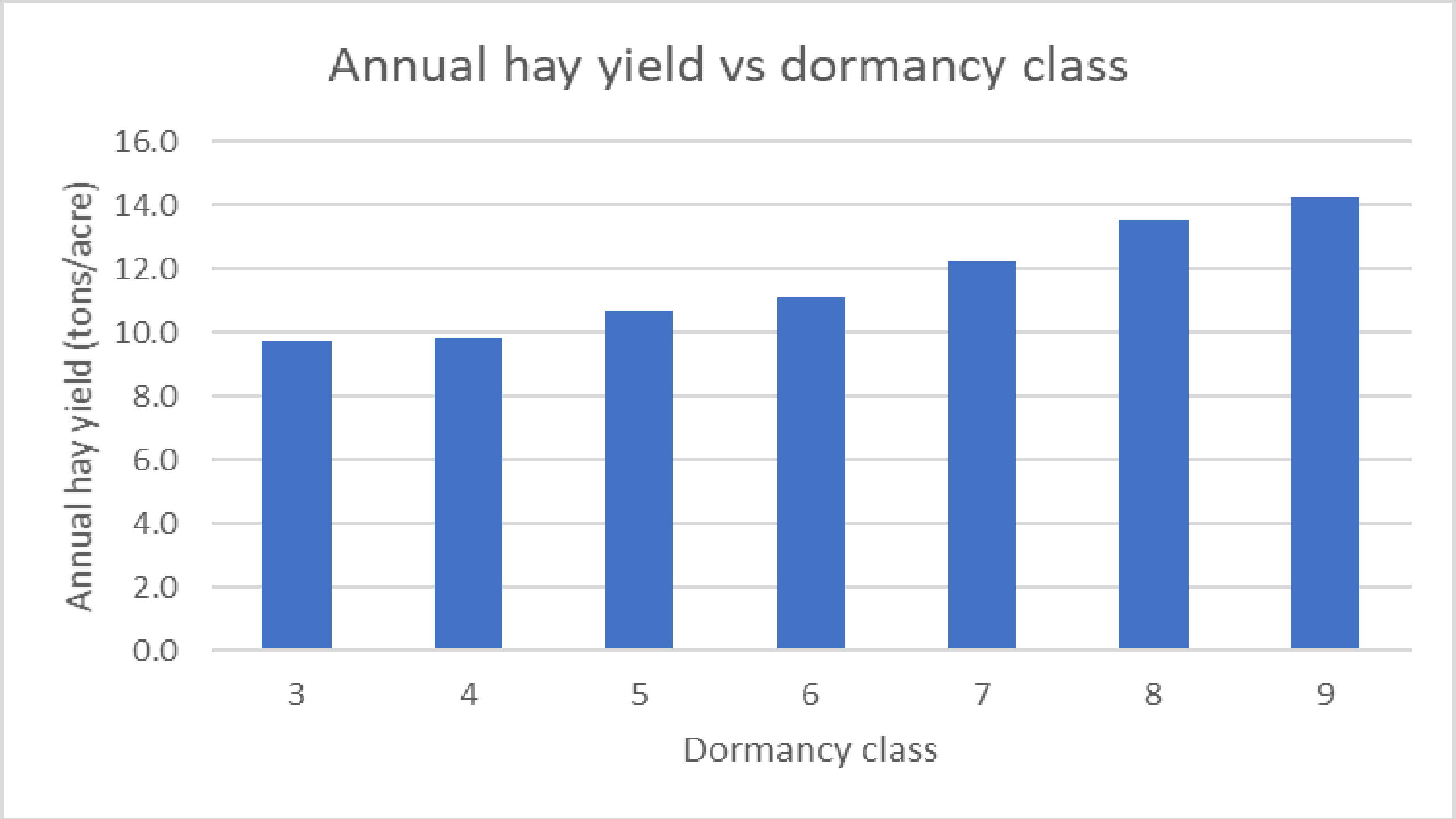
1. Vegetative
2. Bud
3. Flower
4. Seed pod

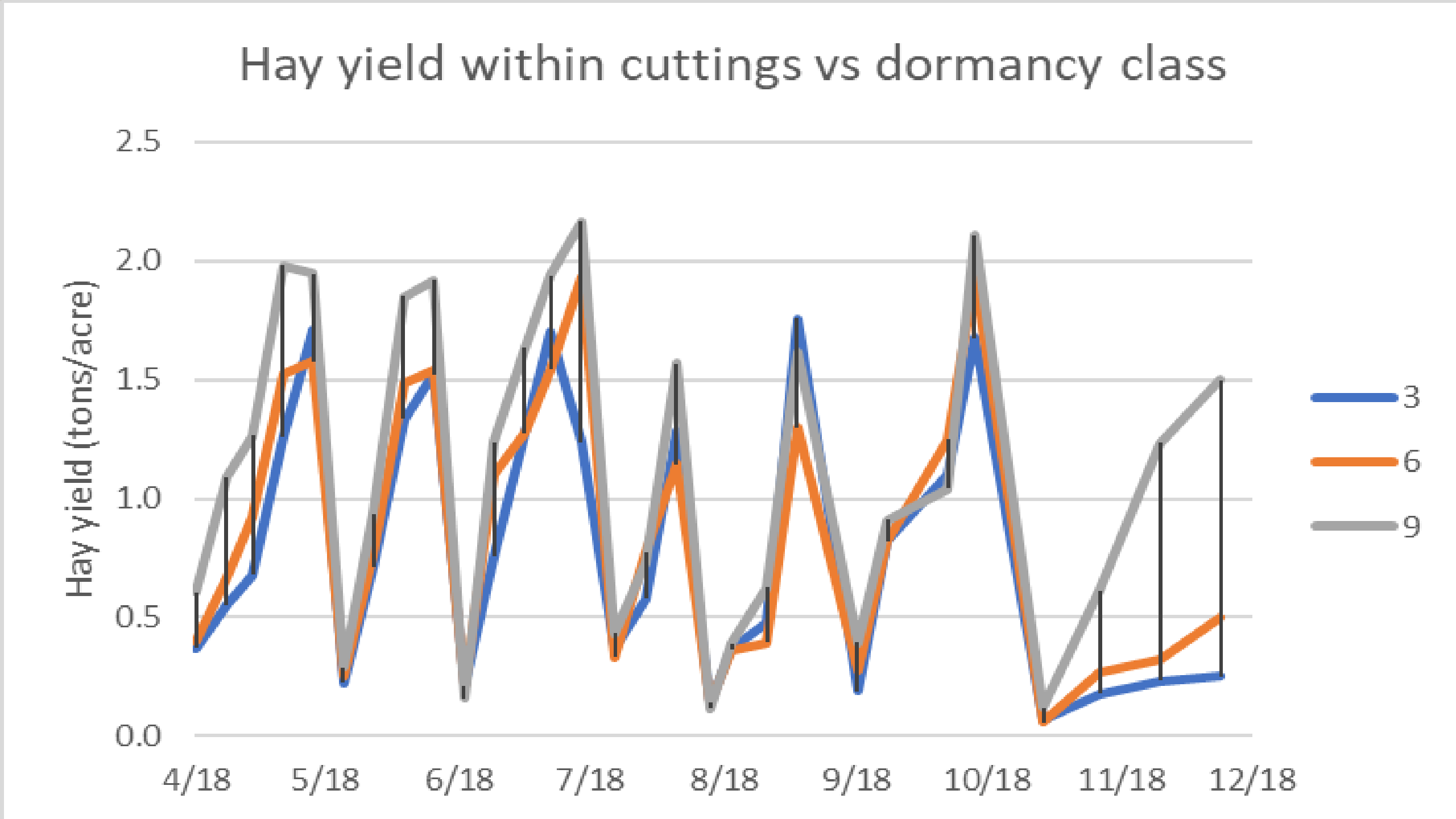
ALFALFA DORMANCY STUDY

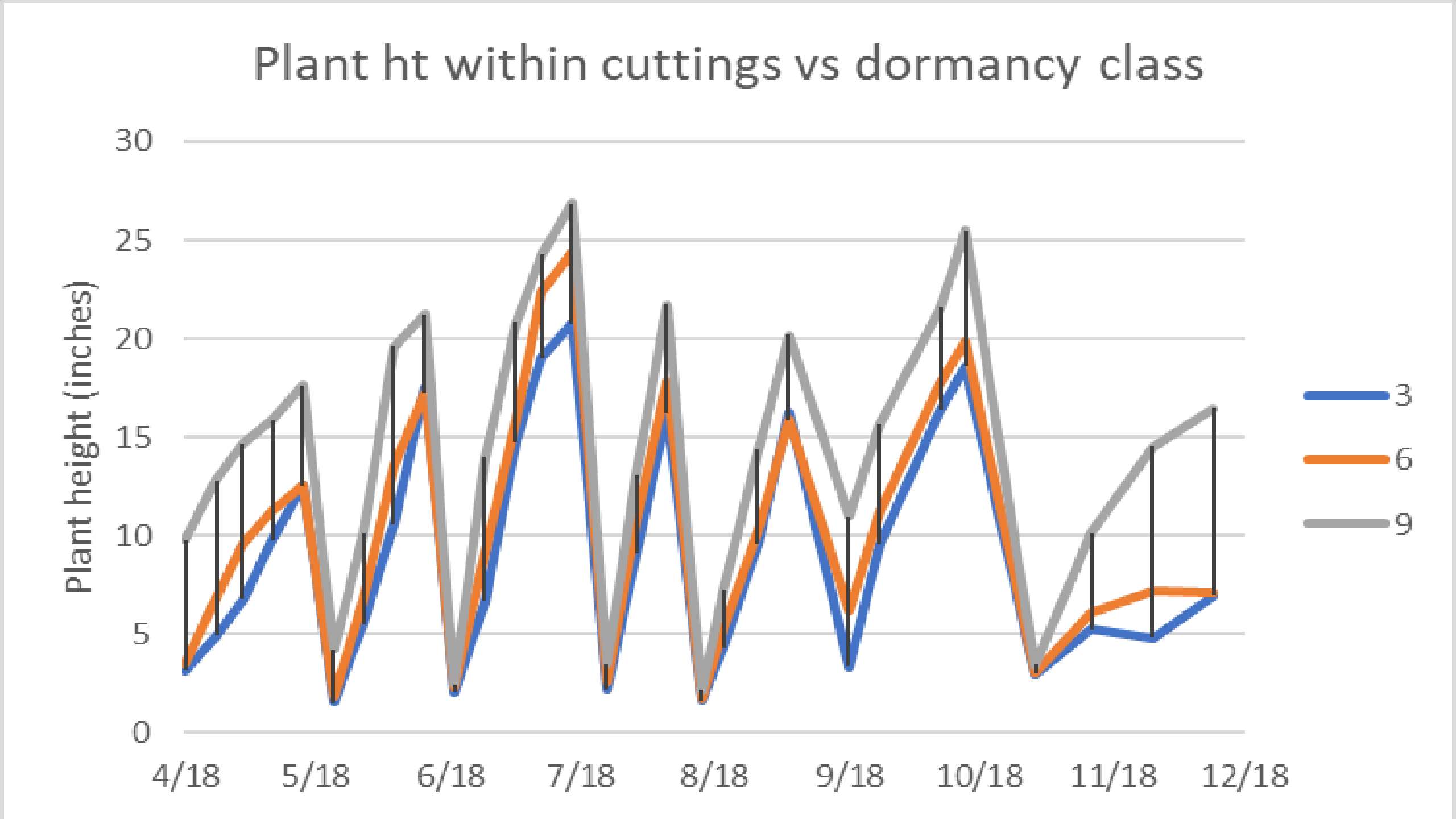
- Location = Tucson
- Planting date = February 9, 2018
- Plot size = 5.5 ft x 10 ft
- Cuttings = 7 (due to February sowing)
- Sampling within cuttings = 4 (for Rugged, Cisco II, CUF 101)
- Varieties = 7
- Measurements (within cuttings) = biomass, height, crop cover, leaf/stem/bud/bloom ratio, nodes

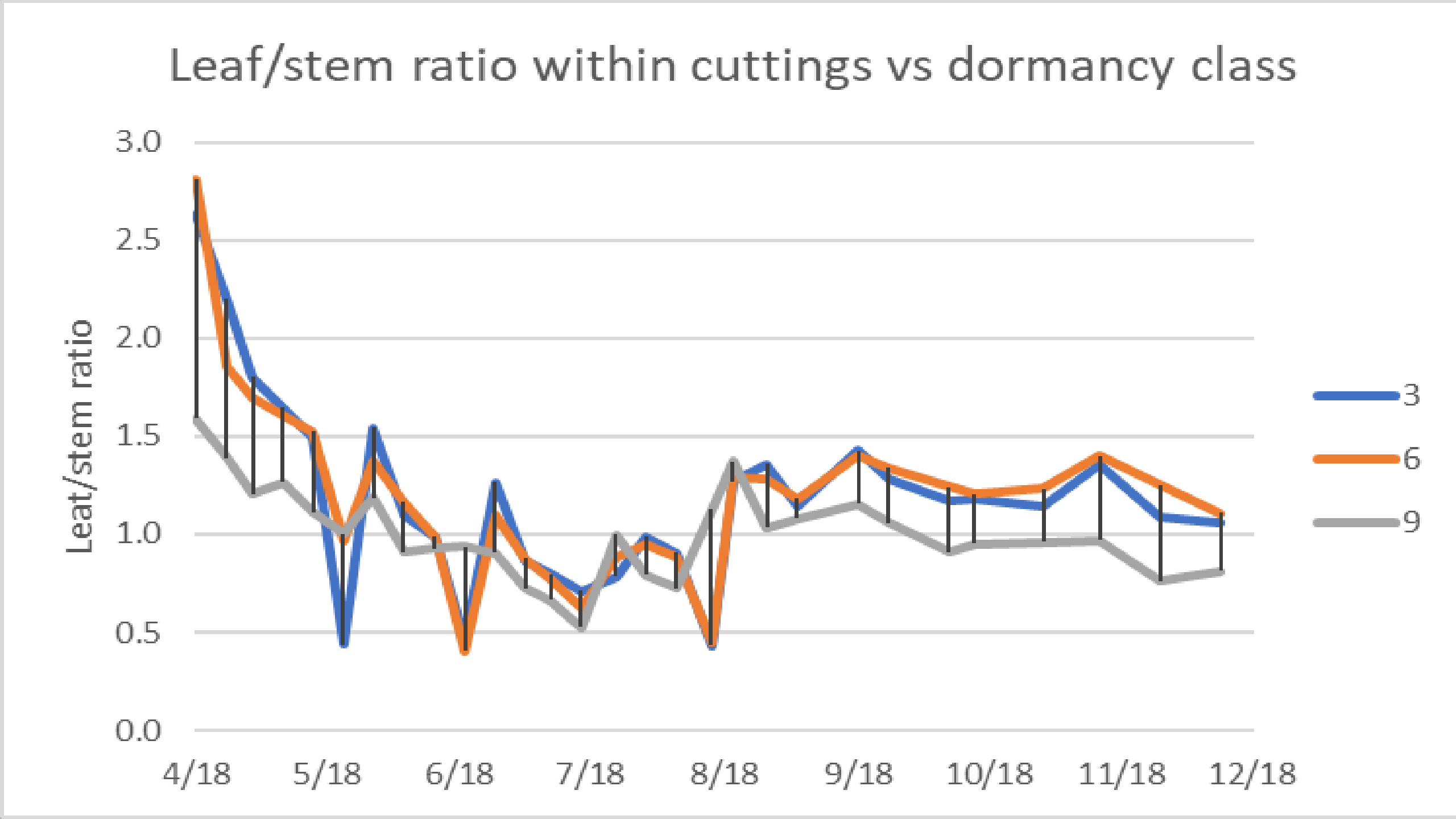
Variety	Dormancy
Rugged	3
Magnum 7	4
PGI 557	5
Cisco II	6
SW 7410	7
Pacifico	8
CUF 101	9

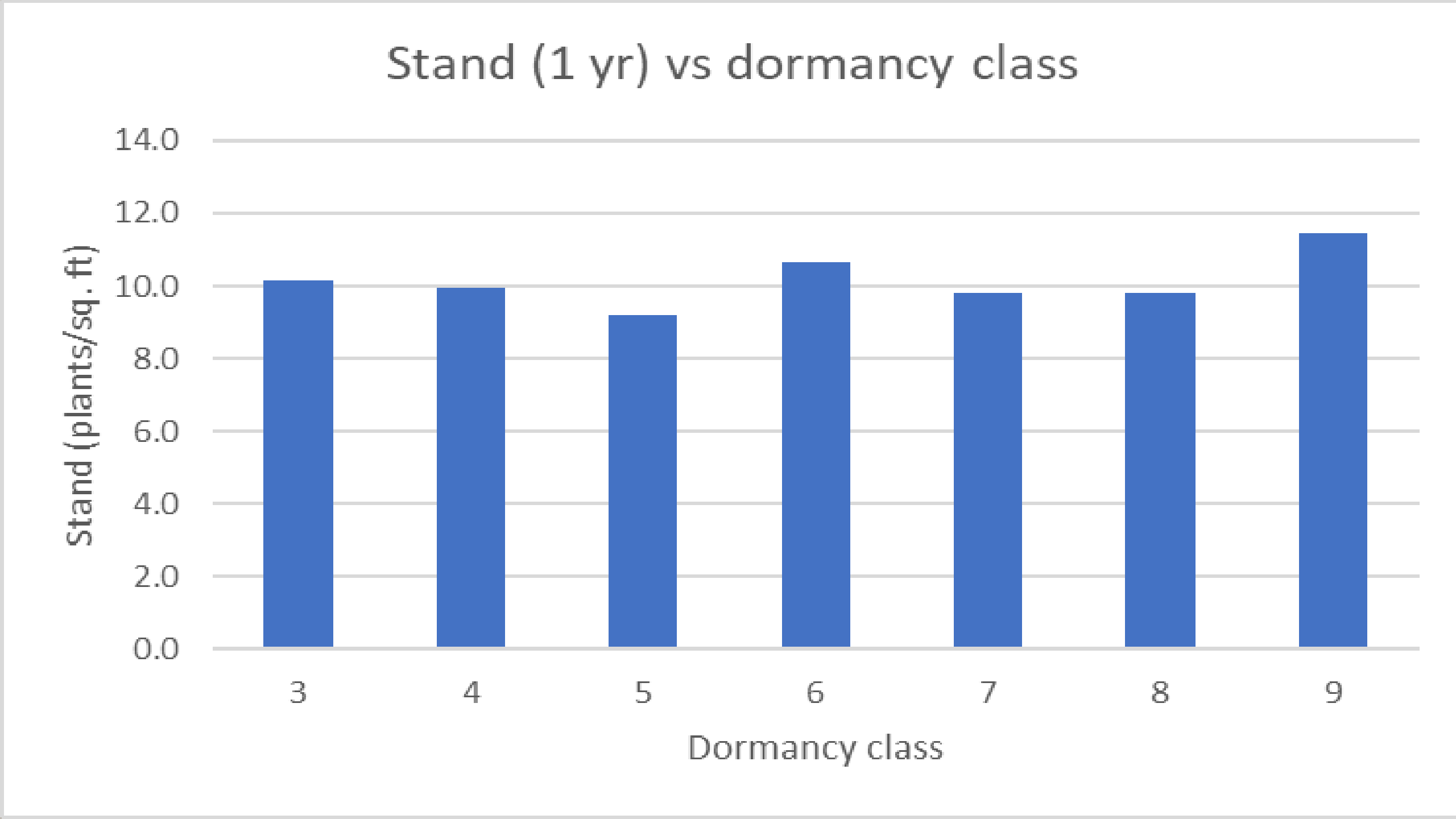

Hay yield vs dormancy class
Hay yield (tons/acre)
3.0
2.5
2.0
1.5
1.0
0.5
0.0
5/17
6/17
7/17
8/17
9/17
10/17
11/17
12/17
3
4
5
6
7
8
9


Annual hay yield vs dormancy class
16.0
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
Annual hay yield (tons/acre)
3
4
5
6
7
8
9
Dormancy class


Hay yield within cuttings vs dormancy class
Hay yield (tons/acre)
2.5
2.0
1.5
1.0
0.5
0.0
4/18
5/18
6/18
7/18
8/18
9/18
10/18
11/18
12/18
3
6
9


Plant ht within cuttings vs dormancy class
Plant height (inches)
30
25
20
15
10
5
0
4/18
5/18
6/18
7/18
8/18
9/18
10/18
11/18
12/18
3
6
9


Leaf/stem ratio within cuttings vs dormancy class
Leat/stem ratio
3.0
2.5
2.0
1.5
1.0
0.5
0.0
4/18
5/18
6/18
7/18
8/18
9/18
10/18
11/18
12/18
3
6
9


Stand (1 yr) vs dormancy class
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
Stand (plants/sq. ft)
3
4
5
6
7
8
9
Dormancy class

PRICE SENSITIVITY OF HAY RELATIVE FEED VALUE (RFV)

RFV	Category	Hay price	Ratio
120	Utility	167	1.00
130	Fair	183	1.09
140	Fair	191	1.15
150	Good	200	1.20
160	Good	209	1.25
170	Premium	217	1.30
180	Premium	226	1.35

(Mike Rankin, U. Wisconsin Extension)

CONCLUSIONS

- Semi-dormant and dormant varieties
  - Grew slower after a cutting than nondormants
  - Yielded 78 (semi-dormant) and 68% (dormant) of the nondormant variety CUF 101
  - Had higher leaf to stem ratio at harvest and presumably better quality than nondormants
- Any quality gain from dormant varieties is offset in whole or part by their lower yield
- Whether or not increasing alfalfa quality by use of dormant varieties is better than shorter cutting cycles with nondormants needs more study