

Molecular DNA Markers Utilized to Discern Alfalfa Fall Dormancy Check Cultivars

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Alfalfa cultivars are difficult to distinguish based upon morphological traits. Only a few traits have been used such as multifoliolate leaves and flower color. However, most of the cultivars are characterized by screening for multiple pests including diseases, insects and nematode resistance; salt tolerance, forage quality and a few agronomic traits such as fall dormancy, winter survival, and tolerance of intensive grazing. Molecular markers especially simple sequence repeats (SSR) have not been utilized in alfalfa to characterize alfalfa cultivars. This study was conducted to determine if simple sequence repeat (SSR) DNA markers could be used to distinguish the eleven fall dormancy standard check cultivars of alfalfa. Three differently derived SSR were utilized. Genomic SSR (gSSR) derived from a genomic library of *Medicago sativa*; SSR derived from express sequence tag (EST) from *M. truncatula* and bacterial artificial chromosome (BAC) derived SSR also from *M. truncatula* were all used. SSR primer pairs were fluorescently labeled and sequenced on a 3730 DNA Analyzer. The gSSR were the most informative SSR with 90% being useful followed by the BAC SSR (36%) and EST derived SSR at only 31%. The sequence data were analyzed and a dendrogram was developed to determine relationships among the alfalfa cultivars. Based upon the results from this study we have shown that two of the very fall dormant cultivars (Fall dormancy (FD) class 1 and 2) cluster together, the two FD class cultivars which are typically grown in the Mid-western U.S. FD 3 and 4 clustered together, as did the two semi-dormant (FD 5 and 6) standard check cultivars, while the non dormant cultivars (FD 7 - 11) clustered in a large group. We have shown that SSR can be utilized to group the eleven fall dormancy check cultivars of alfalfa, although additional SSR may need to be developed to clearly identify individual cultivars of alfalfa.

Table of Alfalfa Fall Dormancy Cultivars

Dormancy	Cultivar	Accession #
1	Maverick	PI 601123
2	Vernal	NSL 4099
3	5246	PI 561715
4	Legend	W [^] 22301
5	Archer	W622287
6	ABI 700	W6 22280
7	Dona Ana	NSL 191439
8	Pierce	PI 191439
9	CUF 101	NSL 176075
10	UC-1887	UC-1887
11	UC-1465	UC-1465

Dendrogram

