



## **Drought-Resistant Alfalfa**

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In the spring of 2015 parts of Manitoba, Saskatchewan and Alberta started off very dry. Across the prairies there was concern that forage supplies would be limited and producers scrambled to make alternative plans to address this potential disaster.

Looking at the prairies, drought is a fairly common occurrence starting with the major drought recorded for the region in the 1930s. Local droughts of shorter duration have occurred since then in parts of Canada, especially in the Prairies (late 1950s/early 1960s, 1980s and 1999-2005). The drought in 2001-02 virtually spanned the entire southern half of the country stretching from British Columbia to the Maritimes. Because of this and the impact droughts have on the livestock industry, a recent study of plant genetics indicating that alfalfa, a forage crop used primarily for livestock, could be made more drought-resistant proved to be very interesting. Drought resistant alfalfa could reduce costs for producers and benefit the environment.

Dr. Abdelali Hannoufa, an Agriculture and Agri-Food Canada (AAFC) research scientist has discovered a gene (microRNA156) in the alfalfa plant that regulates its capacity to maintain water content. This gene reduces water loss, so that the plant maintains its water content and can resist drought for a longer period of time.

MicroRNA156 is a master gene regulator; it functions by regulating a network of other genes, called down-stream genes, which control yield, stress tolerance, and other factors. The gene's function is being studied closely and the findings are applied to plants grown under controlled conditions in the Centre's state-of-the-art greenhouse facility.

Drought resistance is an important trait because it maintains a crop's viability through unpredictable climate conditions and increases its adaptability to grow in various soil types. Results also show that the gene increases alfalfa's root length. Longer roots allow the plant to reach deeper into the soil to absorb water and can lock in nutrients. Combined, these benefits translate into savings for the producer.

In addition to being a valuable forage crop, alfalfa is also being looked at as a crop for land reclamation. If Alfalfa can be adapted to less-than-ideal growing conditions that may mean it can help restore soil that has been degraded through prolonged use, or at sites of oil and gas explorations.

Seeded over approximately five million hectares across Canada, Dr. Hannoufa says alfalfa is one of Canada's most important crops, but its full potential has yet to be realized because "it is being contemplated as a competitive, low-input bio-energy crop."

Ongoing research of gene functions, including that of other major crops like canola, may lead to further discoveries that enhance crop quality and performance under less-than-ideal production conditions.

For more on this topic click on [Drought Resistant Alfalfa](#)