ADVANCES IN WEED MANAGEMENT, IS IT GETTING BETTER OR WORSE?

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ABSTRACT

The selling price for clean high quality alfalfa remains as much an incentive today as ever. It is estimated that greater than 75% of acreage is treated for weeds on an annual basis. The market financially rewards for weed free high quality forage with higher prices. In 2011, the price for high test >56 TDN weed free hay toped $280 per ton to the grower, as compared to lower quality non test hay with few weeds approximately $160 per ton. Extremely weedy or rain damage hay was priced even lower. Weed free fields remain an economic inventive for best prices and longer lasting stands. When weeds take over, it weakens alfalfa plants, increases incidence of diseases, insects, and lowers hay quality and a significant loss of income. Maintaining good weed control practices is necessary to sustain an economically viable and healthy producing crop of alfalfa for many years.

Weed Control limitations still exist

No system is without drawbacks. The current weed management program for Alfalfa has made tremendous strides over the decades but still has defined requirements and restriction as to application timing, temperature, environmental influences, regulations, weeds species just to name a few. There are instances where these restrictions impose delays or changes so that the best results are not always achieved. Compromised decisions usually results; in more injury to alfalfa with poor results and higher cost. There are also weeds not effectively controlled by any one herbicide program. In many cases, without combining multi targeted herbicides, that expand the spectrum of control, it is becoming more difficult to achieve desirable results.

The Past

In the 1950 & 60's our general weed control programs included non selective burn down of weeds and alfalfa. Then the standards included Dinoseb with diesel oil, propane flaming, and sheep grazing in established alfalfa. Dinoseb Selective was used in new seedling stands and provided very good control of broadleaf weeds only. These contact herbicides where often mixed with a pre emergent such as diuron, simazine and terbacil to provide long term winter weed control. Slowly, these products have been removed from use and challenged the industry to find new measures to control summer grasses like yellow and green foxtail, baryardgrass; dodder; and perennial weeds such as, Johnson grass, Quack grass, nutsedge sp and Bermuda grass. Weed control in seedling stands posed an additional set of challenges, having to wait for alfalfa plants to reach a larger size before the non-selective herbicides could be applied without killing alfalfa.

During the 1970 & 80's herbicide development was a major focus with chemical company research. It was an era where new evolving chemistries opened up new opportunities. Selectivity

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of post emergent herbicides was introduced and with it the next major step in alfalfa weed control emerged. We now had the option to remove either grasses or broadleaves with little impacts to the alfalfa plant. Poast *sethoxydim*, Select *clethodim,* Buctril *bromoxynil*, Pursuit *imathazapyr*, Raptor *imazamox*, Velpar *hexazinone* allowed the opportunity to control specific problems weeds when the alfalfa plant was small without risk of injury or stand loss. Table 1

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This radically changed the mindset of alfalfa weed managers from using the standard pre plant soil incorporated herbicides which often fell short of desirable control.

With the revolution to new chemistries, research continued on older chemistries targeting specific weed problems. Of the more significant finds, was the registration of Treflan *trifluralin* and Prowl *pendimethain* herbicides. They provided excellent long term summer grass control and were especially important for control of dodder. Their safety on alfalfa coupled with long term residual activity was the first real answer to dodder and grass control.

The present

Roundup Ready alfalfa has clearly shown merit significantly improving weed control to another level. Glyphosate herbicide has proven an effective means of annual weed control and control for some of the most difficult perennial weeds; dandelion, quackgrass, bermudagrass, nutsedge, and Johnsongrass. Many alfalfa herbicides run the risk of some injury to the crop but glyphosate tolerant varieties have proven even safer with Roundup. In addition, being able to stop the invasion of tough perennial weeds any time during the season, it will benefit the life of an alfalfa stand for years. And now for the first time, Dodder and yellow nutsedge and other weeds can be controlled virtually on demand with post emergent use of glyphosate. Table 2

An obvious and well publicized concern about RR technology is the development of herbicide resistance in resident weed populations. Ryegrass *Lolium spp* and horseweed *Conyza* have shown resistance and increasingly more difficult to control. This becomes a real concern as Roundup Ready crop acres increase. Not exclusive of any herbicide, tolerant weeds exist and situations will arise that require combining multiple herbicides into the system. After four years of commercial RR alfalfa, it is clear that combining soil residual herbicides such as Velpar, Chateau, Prowl is needed for general weed control and preventing glyphosate resistant weeds to occur.

The Future

There is little doubt if it continues to be deregulated; RR alfalfa will be a major part of the alfalfa industry in the future. However, all weed problems will not be solved by glyphosate technology alone. It is a powerful tool, but just like other areas of the U.S. and the world, that have continually used RR crops, it has proven not to stand alone and needs be mixed with other herbicides. In addition, not every producer or buyer wants to use this technology or buy genetically modified alfalfa hay. For these reasons, other new herbicides must be discovered and

enter into the alfalfa market. There are new herbicides coming along being tested in alfalfa having potential. They are Fierce *fumioxizen*, Sharpen *saflufenacil* , Spartan/Aurhority *sulfentrazone* to name a few. Table 3.

Summary

So are we better or worse off today? Without question, the herbicides and technologies of today outweigh the strengths of yesterday's herbicides. The flexibility and numerous choices available to growers is far better, more weed specific, cause less crop injury and with less risk to the environment and to human health.

Table 1. Controlling groundsel in dormant alfalfa

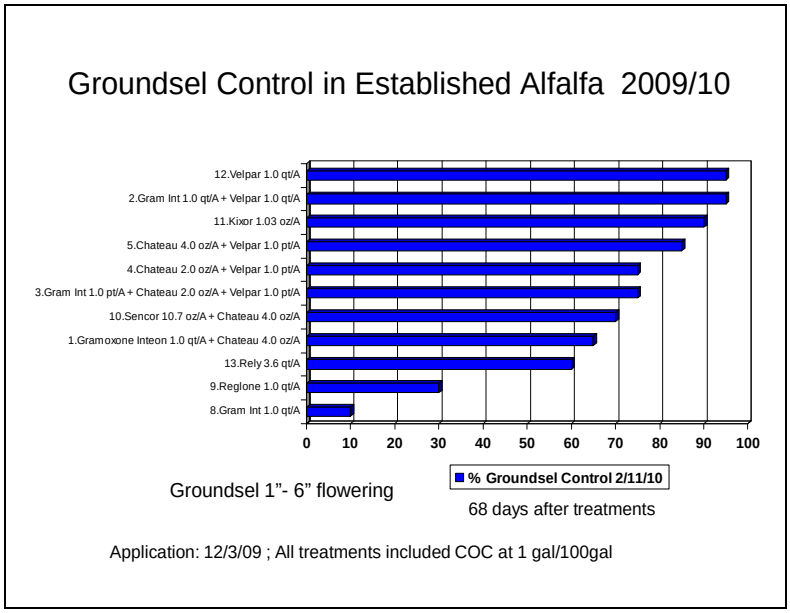

Table 2. Controlling yellow nutsedge with glyphosate in RR alfalfa

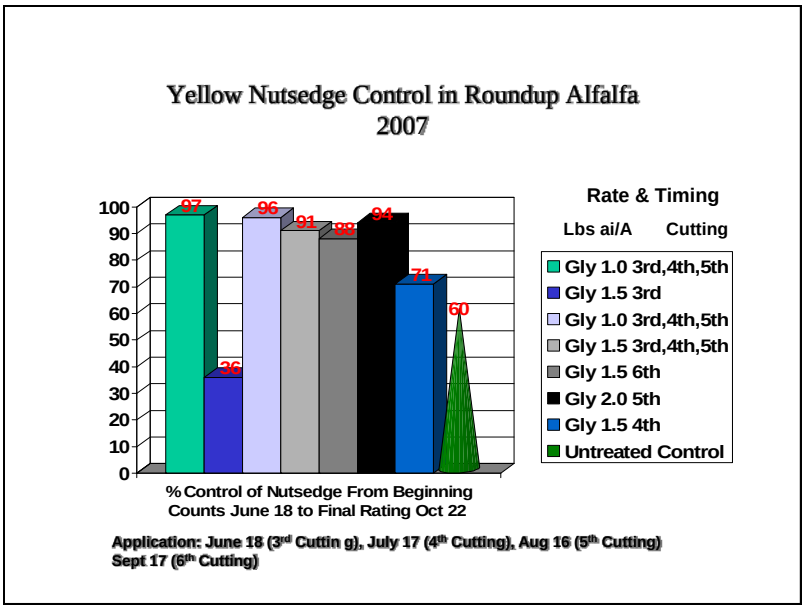

Table 3. New advances in weed control