



# Farm Advisor's Update

A PUBLICATION FOR FARMERS, RANCHERS AND FRIENDS OF AGRICULTURE • COOPERATIVE EXTENSION •

Hey Northeastern California,

How about this weather? It is a little different than the parched landscape which welcomed me to the position back in 2015. It has been uplifting to see shallow lakes form in areas which were recently dry. All this moisture is good, but damage from flooding is not. My thoughts go out to any who have had water damage their properties. Dry pastures and alfalfa fields are not desirable, but neither are those which experience significant standing water. Standing water can create conditions that favor root and crown rot diseases such as pythium and phytophthora. I'll cross my fingers your soils stay wet throughout the year, but any standing water recedes before crop damage occurs!

## Posting of the 2016 Lassen County Weed Research Report

Over the past few months I have had some time to analyze and summarize many of the research trials from the past year. Recently I posted a new edition of the **Lassen County Weed Research Report** to the Lassen County Cooperative Extension website. You can enter this URL to gain access to the full report: [http://celassen.ucanr.edu/Farm\\_Advisor/Weed\\_Research\\_Reports/](http://celassen.ucanr.edu/Farm_Advisor/Weed_Research_Reports/) or Google "Lassen County Weed Research Reports" and it will be the first page that comes up.

I would like to sincerely thank all the cooperators who allowed my colleagues and I to conduct these field trials on their land. I really appreciate their alterations of management practices, donations of time, equipment, and labor to accommodate this work. Without their generosity and help, none of this work would have been completed.

It has been eight years since the last report was posted by my predecessor, Rob Wilson. So, I wanted to bring to your attention the recent addition. I would also invite you to poke back through some of the old reports which Rob authored, as there is a lot of good information within their pages about what works.

With all of the graphs and pictures, the new report is over 40 pages long, which is why you are not receiving a copy in the mail. Below is a list of the projects which have results summarized in the report:

- Weed Control with Sharpen and Shark in Alfalfa and Orchardgrass Mix
- Roundup Ready Alfalfa: Minimizing Injury While Maximizing Weed Control
- Alfalfa Grown for Seed: Weed Control Trial
- Stage One Juniper Control with Various Physical and Chemical Techniques
- Medusahead Control and Perennial Grass Seeding
- Medusahead Control with Pre-emergent Herbicides
- Fall Herbicide Applications for Tall Whitetop

## Description of Other Ongoing Trials - Results Coming Soon:

- Tall Whitetop Drizzle Applications
- Scotch Thistle Control

I understand not everyone has a computer, so please feel free to contact me if you have interest in a specific trial, and I will find a way to get you a hard copy of the information you are interested in.

Additionally, do not hesitate to contact me with any questions or comments (about the report or different subject matter). I can be reached at my office 530-251-2650, my cell 970-481-9174, or by email at [tjgetts@ucanr.edu](mailto:tjgetts@ucanr.edu).



*Medusahead Trial—Treated Spring of 2016,  
picture from Fall of 2016*

## Roundup Ready Alfalfa: Minimizing Injury While Maximizing Weed Control (Summary)

The time of year is approaching to get out and control your weed populations, and I wanted to highlight an ongoing project involving Roundup Ready (RR) Alfalfa.

Below is a summary of a longer document posted on the **California Alfalfa Symposium** website <http://alfalfa.ucdavis.edu/+symposium/2016/index.aspx>, as well as in the **Lassen County Weed Control Report** [http://celassen.ucanr.edu/Farm\\_Advisor/Weed\\_Research\\_Reports/](http://celassen.ucanr.edu/Farm_Advisor/Weed_Research_Reports/). Additionally, a slide show and 25-minute video presentation of Steve Orloff describing this research project are posted on the Alfalfa Symposium website.

Roundup Ready Alfalfa has been a useful tool for difficult-to-control weeds, and has provided application timing flexibility. In particular, perennial species such as Canada thistle, quackgrass and dandelion can be effectively controlled in an RR system. Likewise, many conventional alfalfa herbicides can only be applied while the alfalfa is dormant. However, Roundup is not a panacea for a variety of reasons. Roundup has no soil residual activity, so only emerged weeds will be controlled at time of application. Tank mixes of soil residual herbicides with Roundup can be a good way to address this weakness. Likewise, increasing instances of Roundup-resistant weeds throughout the state threaten its continued effectiveness in some areas. Utilizing multiple modes of actions and weed management techniques is always recommended to reduce the chance of herbicide resistance developing in your field.



*Roundup Ready Trial location near Susanville*

The RR technology was extensively evaluated by university personnel in California and all throughout the country. They found little to no injury to the crop, and trials resulted in effective weed control (although multiple applications were sometimes necessary for late emerging weeds). One benefit of the RR system was the flexibility to make applications throughout the growing season.

If you have an RR field, you may have already heard a bit about this. In the spring of 2014, UCCE Advisor Steve Orloff and a grower noticed something funny going on in a RR field in Scott Valley. An area where wheel-lines were anchored for the winter was not sprayed with Roundup. Alfalfa in that untreated area was much taller than the alfalfa that was treated with Roundup. A trial was conducted later that same spring and the stunting/injury could not be replicated.

In the spring of 2015, a similar situation occurred in Scott Valley. In the field which was most affected, there was a 0.8 ton first cutting yield reduction in the portion of the field that had been treated with Roundup. Alfalfa growth at the Intermountain Research and Education Center in Tulelake is typically behind Scott Valley, so a replicated field trial was initiated there. Alfalfa yield reductions to the tune of 0.3 and 0.4 tons/acre were observed in the trial when Roundup was applied at 22 fl oz/acre and 44 fl oz/acre respectively. No injury was observed in the second cutting, only the first. It was hypothesized that cold temperatures (frost) were needed after an application of Roundup for injury of the alfalfa to occur.

Injury symptoms observed included more than just stunting and yield reduction. Individual stems wilted forming a shepherd's crook (*Photo 1*), and some leaves were malformed and chlorotic (*Photo 2*). However, not all alfalfa plants within a field were affected, and it takes time for these symptoms to manifest after frost occurs.

Trials conducted in the fall of 2015 confirmed that injury symptoms did not develop until frost occurred after an application. Additionally, the fall trials indicated applications to shorter alfalfa resulted in less injury than applications to taller alfalfa.



*Photo 1. Affected stem with wilting shepherd's crook symptom.*



Photo 2. Chlorotic alfalfa plant and wilting stem.

During the spring of 2016, research trials were implemented at 16 locations throughout the Intermountain Region of California and southern Oregon. These trials were designed to investigate what growth stages of alfalfa would be affected, temperatures needed to induce injury, and if the rate of Roundup affected the amount of injury.

There was some variation in the trials from site to site. However, most trials tested two rates of Roundup, 44 fl oz/acre and 22 fl oz/acre, against a conventional standard and untreated alfalfa. Additionally, treatments were made at various growth stages in alfalfa growth from the 2-inch stage up to the 10-inch stage. The temperature was monitored in all fields.

Because of a severe hail storm, significant alfalfa weevil pressure, and general field variability, statistical differences were not apparent at all 16 locations. However, injury symptoms in Roundup-treated plots occurred at 15 of the 16 field locations, and most sites produced reliable data. The only site which did not show injury was a seedling field with warmer conditions following applications than the other fields. According to CIMIS

weather stations, spring temperatures in 2016 were generally milder than springtime temperatures in 2014 and 2015. Likewise, observed injury was less severe in 2016 than the previous years.

RR Alfalfa treated with 44 fl oz Roundup/acre rate had a typical yield decline of 0.3-0.4 tons/acre in the first cutting. Alfalfa treated with 22 fl oz Roundup/acre had a smaller yield decline ranging from 0.1-0.3 tons/acre. In general, more injury was observed in older stands and stands that experienced colder temperatures. Treatments made to alfalfa at a taller growth stage typically had greater yield reductions than applications to shorter plants. Applications made when the alfalfa was less than 2 inches tall did not result in a yield reduction. However, applications made to alfalfa plants larger than 2 inches tended to result in yield reduction.

Research is currently underway to understand the mechanism causing the alfalfa injury, and the best agronomic management practices to avoid any yield reduction.

**Current management recommendations** are to treat fields early in the spring, when the alfalfa has 2 inches of regrowth or less. All weeds may not be emerged when the alfalfa is this small. Because Roundup does not have pre-emergence activity, tank mixing with soil active herbicides may be needed (especially in thinner stands where the crop is less competitive). Additionally, tank mixing herbicides with multiple modes of actions is a good practice for herbicide resistance management. Roundup applications made later in the season after the risk of frost should not result in alfalfa injury, but it can be difficult to predict when spring frosts may occur.

Please do not hesitate to contact me with any questions you may have, or if you are having difficulty finding the detailed report online.

*U.S. Department of Agriculture, University of California, and Lassen County Cooperating.*

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