Sacramento Valley Field Crops Newsletter

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In This Issue

- 48th California Alfalfa and Forage Symposium
- Soil Health and Cover Crop Field Day
- Newly revised UC ANR Cost and Return Study for Hybrid Sunflower Seed Production
- Newly revised UC IPM Guidelines for Dry Beans
- Cover Crop Management in Annual Farming Systems
- New oat hay varieties show disease resistance and frost avoidance
- Few tips for weed management in Garbanzo beans
- Species on concern: Herbicide Resistant Italian Ryegrass
- What to do with those tough-to-control perennial weeds in established alfalfa

Submitted by:

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Meeting Announcements

48th California Alfalfa and Forage Symposium

Reno, NV
November 27-28-29, 2018

For a detailed agenda, and registration information for attendees and exhibitors, visit: http://calhay.org/symposium/

This year's theme is "Building Healthy Forage Systems". A special ***Soil Health & Fertility Workshop*** will also be offered on Day 1, combining lectures and hands-on demonstrations. The workshop is followed by the 1.5-day symposium featuring industry trends, pest management, economics and markets, dairy industry, exports, regulations, forage quality, water management, and genetics. These are just a few of the topics that will be covered in this year's Symposium.

Now in its 48th year, the Alfalfa Symposium is a comprehensive and educational program for anyone with an interest in important issues related to alfalfa and forages. Typically, we have 450-800 attendees and 60-90 exhibitors. The symposium program has been developed by the University of California Alfalfa Workgroup (UC Cooperative Extension), and the California Alfalfa & Forage Association. Come join us!

Save the Date!

Soil Health and Cover Crop Field Day

Meridian, CA
Thursday, December 6, 2018

8:30am: coffee and registration; 9:00am-11:00am: program

Join us as we launch the beginning of a state-wide Healthy Soils project supported by CDFA, with topics on:

* Managing winter cover crops in annual rotations in the Sacramento Valley
* Hands-on soil health demonstrations
* Measuring changes in soil carbon based on management practices

Contact Sarah Light (selight@ucanr.edu) with any questions.

Newly revised UC ANR Cost and Return Study for Hybrid Sunflower Seed Production

The UC Agriculture and Natural Resources Agricultural Issues Center (UC ANR) has released a study on the costs and returns of producing sunflowers for hybrid seed in the Sacramento Valley. Although acreage is relatively small (about 50,000 acres), sunflower seed is an important crop because California growers produce the seed for planting stock, destined to be planted in many areas around the world for oilseed and confectionary snack food markets.

The study estimates the cost of producing sunflowers on 200 acres, as part of a row crop rotation, using sub-surface drip irrigation. Input and reviews were provided by UC ANR Cooperative Extension Farm Advisors and other agricultural associates. Current costs for the sunflower crop were used, including material inputs and cash and non-cash overhead. A ranging analysis table shows profits over a range of prices and yields. Other tables show the monthly cash costs, the costs and returns per acre, hourly equipment costs, and the whole farm annual equipment, and investment and business overhead costs.

This study and other sample cost of production studies for many commodities are available through UC ANR. They can be downloaded from the UC Davis Department of Agricultural and Resource Economics website at http://coststudies.ucdavis.edu.

For additional information or an explanation of the calculations used in the studies, contact the Agricultural Issues Center at (530) 752-4651 or the Sacramento Valley based UCCE Farm Advisor authors, Rachael Long, rflong@ucanr.edu, Sarah Light, slight@ucanr.edu, and Mariano Galla, mfgalla@ucanr.edu.

Newly revised UC IPM Guidelines for Dry Beans

The Insect and Mite sections of the UC IPM Pest Management Guidelines for Dry Beans have been recently revised and updated and are now available online at: **UC IPM Dry Beans Pest Management Guidelines.**

Authors include UCCE Farm Advisor Rachael Long and UC IPM Advisor Pete Goodell (emeritus). The guidelines include an updated photo page to help identify pests and the damage they cause to dry beans at: **Photo Identification**.

These guidelines can help with managing pests in your fields. Interested in *Lygus* bugs and how to control them? Take a look at the guidelines on lygus and see that the thresholds vary by bean class and type. For example, blackeye beans (cowpeas) have different tolerance levels to lygus than lima beans. Some lima bean varieties are more tolerant to lygus than others. Interested in biocontrol of aphids? See photos of natural enemies that prey on aphids at: **Photos to identify natural enemies of aphids.** There is also a newly revised table on the relative toxicities of insecticides and miticides to natural enemies and honey bees in dry bean production, found at: **Insecticide Toxicities.**

This information and much more is available through the newly revised 2018 UC IPM Dry Bean guidelines! This follows the recent revision of diseases and abiotic disorders in dry beans. The weed management section is currently in review and will be available later this year.

UC IPM

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Cover Crop Management in Annual Farming Systems

Sarah Light, Agronomy Advisor, UCCE Sutter, Yuba, Colusa Counties

Fall is the time to plant your winter cover crops. The impact of cover crops can be variable, depending on plant variety and management practices. Choosing the right cover crop is important and deciding what to plant will depend on your on-farm goals.

Why cover crop?
Cover crops add organic matter to soil, which increases microbial activity, and leads to good soil aggregation and improved soil structure. This increases water infiltration and reduces the risk of soil compaction. In addition, cover crops can provide nitrogen for subsequent crops, suppress weeds, provide floral resources for beneficial insects including bees and natural enemies, and reduce soil erosion and nitrate leaching. Some of the benefits of cover cropping won't be seen in the first year but maintaining good soil quality is important for long term on-farm productivity.

Cover crops can involve additional costs and management. We recommend planting cover crops that work with your existing farm equipment to keep costs down. Additionally, some cover crops can favor pests and should be avoided in certain crop rotations. For example, bell beans are a key host for tomato spotted wilt virus, which is vectored by thrips. Mustard and radish attract beneficial insects but are also significant hosts for pests such as stink bugs, cucumber beetles, flea beetles, and *Lygus* bugs.

Selecting the Right Cover Crop:
Common cover crops include legumes (vetch, clovers, bell beans, field peas), grasses (wheat, triticale, oats), and brassicas (mustard, radish). There are advantages to all of these and the decision to plant one over the other can be driven by what you are trying to achieve.

Legumes fix nitrogen from the air into their roots through symbiotic relationships with rhizobia bacteria. If your goal is to increase nitrogen for subsequent crops, planting a high-biomass legume is best. The amount of nitrogen fixation by a cover crop is related to plant biomass. Thus, the optimum time to incorporate a cover crop for peak nitrogen fixation is at the flower bud stage. Too early would be a loss in biomass (and N) and later in the season risks the cover crop setting seeds. Once legumes start to set seed, the nitrogen will be moved into the seed and will not available for subsequent crops. Plus, you may have problems with weed seeds in subsequent crop rotations. Be sure to inoculate legume cover crop seeds with the right strain of rhizobia bacteria to make sure legumes can effectively fix nitrogen while growing.

Non-legume cover crops (small grains, brassicas) do not fix nitrogen, but many grasses and brassicas are relatively deep rooted—allowing them to mine nitrate that remains in the soil profile from the previous crop, or that has leached below the root zone for more shallow rooted crops. Thus, cover crops can improve nitrogen cycling in the field by reducing the amount of nitrate that is lost from the system. Deep rooted crops (like daikon radish) may also help alleviate soil compaction by opening up the soil. Another advantage of using grasses and brassicas is that they produce a lot of biomass, and often have fast initial growth, enabling them to outcompete weeds. Due to their higher carbon to nitrogen ratio, grasses won't break down as rapidly and may reduce the amount of available nitrogen in the soil for a period of time. Brassicas have a lower carbon to nitrogen ratio and will break up more quickly.

Some growers have had success planting a cover crop mix, for example a 2-seed combination of a grass and a legume, or a mix with 3 or more seed varieties. If planting a mix, keep seeds well mixed in the hopper and plant to a "compromise depth." in other words, if one type of cover crop wants to be planted at 1-inch, and the other at 3-inches, plant both at 2-inches.

Do not let your cover crop go to seed. If it goes to seed, it can become a weed in subsequent years. This is very important for realizing the benefits of cover cropping, without introducing new problems on your farm.

Cover cropping can be an opportunity to experiment on your farm. If you aren't sure what will work well and there are several cover crops that interest you, try planting them in strip trials in a field. This will allow you to evaluate which work best for your management system and equipment. I'd be glad to talk with you about planting a cover crop on your farm. Feel free to contact me at selight@ucanr.edu or 530-822-7515.

There are several cover crop resources in the UCANR Catalog and a database with information about different species of cover crops can be found: https://ucanr.edu/sites/asi/db/covercrops.cfm

Additional UC ANR Cover Crop Resources:
Cover crops for California Agriculture
Cover Cropping for Vegetable Production
Cover Cropping and Conservation Tillage in California Processing Tomatoes
Small Grain Cover Crops
Cowpea Production: Sample Costs and Benefits as a Summer Cover Crop
Cover Cropping in Vineyards: A Grower's Handbook
Cover Crops for Walnut Orchards

Winter rye cover crop being rolled ahead of incorporation and field prep for summer crop. Photo: Jeff Mitchell.

New oat hay varieties show disease resistance and frost avoidance

Rachael Long, Farm Advisor, UCCE Sacramento, Yolo, Solano Counties

There are several relatively new oat hay varieties for grain and forage production that show better disease resistance than the standard California Red and Montezuma varieties. These include UC 113, UC 128, and UC 148 (Baglietto Seeds) and UC 125 and UC 132 (Barkley Seed/Lockwood). These varieties also show some frost avoidance, as they head out later than Montezuma, helping to escape frost injury. In general, more mature spring cereals are at greater risk of being affected by frost, because the growing point is further from the ground and less buffered from a frost, than less mature plants.

Following is a description of these UC varieties, compared with Montezuma. More information is available at http://smallgrains.ucanr.edu/files/282307.pdf. These new varieties were developed by Dr. Qualset, Small Grains program, UC Davis, and are generally grown together in hay (e.g. oats, barley, and wheat) or for grain.

- UC 113: Heading later, 4-5 inches shorter. Excellent straw strength, thicker. Good resistance to barley yellow dwarf virus and stem rust. Higher grain and hay yields, higher crude protein, and lower acid and neutral detergent fiber percentage.

- UC 125: Heading later, 4-5 inches shorter. Excellent straw strength, thicker. Good resistance to barley yellow dwarf virus and stem rust. Grain and hay yields higher, higher crude protein, and comparable acid and neutral detergent fiber percentage. Recommended for planting in areas north of the Sacramento Delta, up to Willows, CA.

- UC 128: Heading later, 8-10 inches taller. Excellent straw strength, thicker. Very good resistance to barley yellow dwarf virus and crown and stem rust. Higher grain and hay yields, higher crude protein, comparable acid detergent fiber, but higher neutral detergent fiber percentage.

- UC 132: Heading later, 5-8 inches shorter. Excellent straw strength, thicker. Good resistance to barley yellow dwarf virus and crown rust. Higher grain and hay yields, higher crude protein, and comparable acid and neutral detergent fiber percentage. Recommended for planting in areas south of the Sacramento Delta, down through the low desert.

- UC 148: Heading later, 3-inches taller. Good straw strength, thicker. Good resistance to barley yellow dwarf virus and crown rust. Higher grain and hay yields, higher crude protein and comparable acid detergent but higher neutral fiber percentage.

Frost injury to Montezuma (left) when night-time temperatures dipped below 32°F in mid-February (CIMIS, Davis, 2018). Newer oat hay varieties (right) head out later, often avoiding frost injury.

Few tips for weed management in Garbanzo beans

Mariano Galla, UCCE Agronomy & Weed Science Advisor, Glenn, Butte, Tehama Counties

If you are going to plant garbanzo beans this fall, make sure to have a weed management plan organized. Garbanzo beans have a long growing season, from winter to summer, that makes weed management strategies particularly difficult. During the winter months, garbanzos grow slowly and they are particularly sensitive to competition from winter weeds such as mustard, wild radish, prickly lettuce, London rocket, shepherd's-purse, and sow thistle. Spring germinating weeds include redroot pigweed and other *Amaranthus spp.*, nightshade, common lambsquarters, knotweed, and Russian thistle.

A good way to help your garbanzo beans outcompete weeds is to plant into moisture. In addition, consider increasing plant density: for example, 3 rows versus 2 rows on 60-inch beds.

Standard practices include the use of pre-emergent herbicides that are sprayed on the soil after the crop is planted, but before crop and weeds emerge. Water (rain or sprinklers) incorporated herbicides like Chateau and ProwlH20 are often used. Weeds can also be controlled with the pre-plant incorporated herbicide Treflan. Dual Magnum® or Prowl can be tank mixed with Treflan for a greater spectrum of weed control. Dual Magnum controls yellow nutsedge, however, it can cause crop injury in cold, wet soils where garbanzos are planted deep into moisture.

Most growers use a combination of different pre-emergent herbicides in order to increase the residual activity and the spectrum of weeds controlled. Unfortunately, if the residual activity of pre-emergent herbicide starts breaking down in spring, and there is a new flush of weeds, there are not many options for controlling them. Cultivation can be effective, but only before row closure. Grass weeds can be easily controlled with either Poast or SelectMax. In case of a field with heavy infestation of broadleaf species, rotate with crops like corn or small grains where available herbicides can control broadleaf species.

More information can be found on the newly revised, 2018 UC IPM dry bean guidelines website (http://ipm.ucanr.edu/PMG/selectnewpest.beans.html). We are currently conducting field trials in the Sacramento Valley for evaluating different herbicides for improved weed control in garbanzo beans.

Species of concern: Herbicide Resistant Italian Ryegrass

Mariano Galla, UCCE Agronomy & Weed Science Advisor, Glenn, Butte, Tehama Counties

Last winter, many growers and PCAs contacted me because they were having trouble or were largely unable to control Italian ryegrass (*Lolium perenne* ssp. *multiflorum*) in their cereal fields. This grass species (see Photo) is widely spread throughout the Sacramento Valley in orchard and field crops and it can be particularly problematic in winter cereals, as it can reduce yields by 80%, by competing for water and nutrients.

Italian ryegrass is a really tough weed and the application timing is extremely important. Osprey, Simplicity and Axial are usually effective. However, all these herbicides will not work if applied when the ryegrass population in your field has more than two tillers. Thus, it is extremely important to have an adequate weed monitoring program, especially when the growing conditions are optimal for ryegrass establishment and growth.

Unfortunately, ryegrass has also proven to be quick to develop resistance to multiple herbicide modes of action (MoA) and cases of resistance have been reported throughout California and the US.

In February, a PCA in Glenn County called me because he was unable to control a ryegrass population with almost any herbicide he could think of. Testing few herbicides along one edge of the field, I found that osprey, axial and simplicity

were not working. The only herbicides that controlled the ryegrass population were Rely and Gramoxone… not a great news for wheat growers, as these two herbicides will be equally effective in killing wheat!

Talking with Mark Lundy, UC Small Grains Extension Specialist, and Konrad Mathesius, a UCCE Agronomy Advisor, we realized that many cereal growers around California have been complaining about herbicide resistant Italian ryegrass and that the problem is quickly spreading. Integrating alternative methods of control, such as mechanical cultivation and rotating herbicide MoA can help control ryegrass and delay the development of resistant populations.

Starting this fall, we will conduct a series of field experiments with the overall, long-term objective of developing an integrated weed management system for Italian ryegrass. In particular, we will look at both chemical and non-chemical management strategies. If you're looking for more information or are interested in the field trials feel free to contact me at the UCCE Glenn County office (530-865-1105) or via email: mfgalla@ucanr.edu

Italian ryegrass seedling, note the shiny leaves

What to do with those tough-to-control perennial weeds in established alfalfa

Thomas Getts, UCCE Weed Ecology and Cropping Systems Advisor, Lassen County
Mariano Galla, UCCE Agronomy & Weed Science Advisor, Glenn, Butte, Tehama Counties
Lynn Sosnoskie, UCCE Agronomy and Weed Science Advisor, Merced County
Rachael Long, Pest Management & Agronomy Advisor, Sacramento, Yolo, Solano Counties

For mid-season weed control in older alfalfa stands, it's important to determine: 1) what types of perennial weeds are present, and 2) how many of them there are. These factors will determine if a bit of injury to the alfalfa would be worth trying to clean up the field with an herbicide application. Identifying and controlling poisonous weeds should be an especially high priority. Among tough-to-control weeds, plantain and nutsedge are benign, but curly dock has potential to cause problems. Exposure to soluble oxalates that curly dock may contain are a low risk for renal disease for livestock because typically it is not that abundant in alfalfa hay fields. However, curly dock is also known to be able to accumulate toxic nitrate concentrations if grown under certain conditions, such as high levels of nitrogen fertilization (not typically applied in alfalfa), or frost. Regardless, high enough concentrations of any weeds in hay, poisonous or not, will lower the value and quality of the product produced, and should be addressed.

What can be done about weeds mid-summer for non-Roundup Ready (RR) alfalfa?

Grasses: Grass weed control is relatively easy, with Poast or Select Max available for both annual and perennial grasses (e.g. barnyardgrass, foxtail, and Johnsongrass). Poast and Select Max are both systemic herbicides which move through the plant and are more effective when the weeds are actively growing. Mid-season applications after a cutting may be more effective following an irrigation, to ensure the weedy grasses are not drought stressed, so herbicide effectiveness is maximized.

Sedges: Suppressing sedges can be somewhat more difficult, but is possible if done right. Often mistaken as a grass, nutsedge can be difficult to control any time of the year. Applications of EPTC in irrigation water or use of a granular

formulation can give suppression of nutsedge. The liquid formulation of EPTC requires uniform metering of the herbicide into water during irrigation, which may not be effective on heavy soils. Sandea can be used for post-emergence control of nutsedge in established alfalfa. However, Sandea can cause temporary stunting and yellowing of the crop when applied during the growing season in the Central Valley. Nutsedge can also be effectively controlled, before alfalfa is planted, by staying on top of an herbicide program in other parts of the rotation.

Perennial broadleaves: Perennial broadleaf weed control is challenging during the summer, particularly with well-established weed populations. Chateau, or Shark, might be of some help by providing a burndown of the aboveground foliage for perennial weed species. While this may sound desirable, most perennial weed species will regrow from the roots, just like the alfalfa, so control would be short lived and may only last for a single cutting. Both products have labels for weed control in established alfalfa between cuttings with language directing applications to be made as soon as possible after hay is removed from the field, and before there is 6-inches of regrowth on the alfalfa stand. It should be noted that both products will also burn back alfalfa in addition to the weeds.

Raptor can also provide control of some broadleaf and annual grass species. The label directs applications between cuttings to be made before there are 3-inches of alfalfa regrowth. Unlike Chateau and Shark, Raptor is a systemic product which will not burn back the weeds or alfalfa on contact, but can still cause a reduction in crop growth, while controlling small weeds. Unfortunately, out of the three problematic weeds listed in this article, only curly dock is listed on the Raptor label and only suppression, not control, can be expected from a successful application.

Butyrac 200 (2,4-DB) could be an option for control of either curly dock, or common plantain.
According to the UC IPM herbicide sensitivity chart for alfalfa, Butyrac 200 is able to partially control established broadleaf plantain. Where the label indicates, applications to small curly dock plants less than 3-inches can also be expected to provide suppression. However, potential crop injury may also be a deterrent for use in established stands. Crop safety of alfalfa to Butyrac 200 is better for seedling alfalfa as compared to established plants, which are likely to display more leaf deformation and yellowing. If applications of Butyrac 200 are made, healthy, actively growing alfalfa will be more tolerant to the applications than stressed plants. As Butyrac 200 is a restricted material, it is important to follow the regulations and best management practices for use, in order to reduce the potential for off target movement.

Should a treatment be made? Different considerations for different seasons.

Summer
In summer, alfalfa foliage burn back from products like Shark or Chateau is temporary, lasting about a week; visual effects from dormant season applications with these herbicides may last a month or more. There may be a 7 to 10-day loss of growth when using these herbicides mid-season late (August and September). If using these contact herbicides between cuttings, either let the alfalfa grow longer before harvesting (our recommendation) or expect approximately a 10% yield loss for a scheduled 28-day interval cutting. Other post-emergence selective herbicides are either not registered for use during the growing season, or they have too long of a pre-harvest interval (PHI) to be utilized in most California systems.

Certainly, if there are poisonous weeds out there, the decision to treat is made easy, but if they are standard run of the mill weeds, a decision needs to be made on what is tolerable to both the consumer, and the producer. Recently germinated summer annual weeds in large enough numbers can be prime examples of when mid-season applications between cuttings may be necessary and cost effective. Treating well-established populations of most perennial weeds between cuttings may be a waste of time, as perennial weeds will be suppressed, not controlled, making crop yield loss from herbicide injury much less acceptable.

Summer alfalfa herbicide treatments can be further confounded by the cutting cycles. Weeds are most susceptible to chemical treatments right after they have germinated when they are small and actively growing, which is why most alfalfa weed control measures take place in the late fall or early winter. Established annual and perennial weeds, which

have been cut in an alfalfa field, can be less susceptible to herbicide control, as they become 'hardened-off' from being cut and drought stressed during the harvesting process.

Dormant season

The dormant season is when most alfalfa weed control applications occur, targeting winter annual weeds and the first flushes of summer annual weeds. The dormant season applications can also be effective at suppressing or controlling perennial weeds in the field. Applications of Gramoxone and Velpar are standard dormant season treatments with a wide spectrum of weed control. Seedlings of most perennial species, including curly dock, will be controlled by Velpar applications. More established curly dock plants and other perennial species can be suppressed by the dormant season treatments but are typically not eliminated. Other perennial species such as nutsedge which are not active at time of application can be missed by dormant season applications.

Remember: The best time to control perennial weed populations in alfalfa is before the stand is established. Crop rotation gives growers the ability to target difficult-to-control species in crops that utilize more effective weed control practices, for example, broadleaf weed control in wheat. In fields with heavy perennial weed pressure, RR alfalfa may be a good choice for producers not able to address the perennial weed problem before establishment. With conventional varieties, mid-season perennial weed control may require a trade-off between weed control and crop injury concerns.

Photo One: Sacramento Valley alfalfa with tough to control weeds, including curly dock, plantain, and nutsedge.