University of California
Agriculture and Natural Resources | Cooperative Extension

Wheat Field Day

Colusa County, CA

Tuesday March 12th, 2019 ~ 8:30-11:00am

8:30 am Registration

9:00 am Welcome and the Nitrogen Opportunity
Sarah Light, Agronomy Advisor, UCCE Sutter, Yuba, Colusa Counties

9:15 am In-Season N Decision Making and How to Create a N Calibration Zone in the Field
Mark Lundy, Small Grains Specialist, UC Davis

9:30 am Demonstration of Soil Nitrate Quick Test
Mark Lundy, Small Grains Specialist, and Sarah Light, Agronomy Advisor

9:45 am Real Time Plant Sensing Using Hand-held Tools and Drone Imaging
Mark Lundy, Small Grains Specialist, and Taylor Nelsen, Assistant Specialist, UC Davis

10:00 am Interpreting Field Measurements and On-Farm Decision Making
Mark Lundy, Small Grains Specialist, UC Davis

10:15 am Grower Perspective on N Rich Strips
Kim Gallagher, Erdman Farms

10:30 am UC Small Grain Variety Testing Program Tools and Updates
Mark Lundy, Small Grains Specialist, UC Davis

10:45 am Variety Trial Observations

Contact Sarah Light with questions: selight@ucanr.edu ~ 530-822-7515

Directions:
Turn left on Wilson Bend Rd off Highway 45 South. Field is approximated 1.4 miles down.
Follow UCCE signs.
(Lat/Long: 39.033851, -121.84004)

Sacramento Valley Field Crops Newsletter

Issue 5 Winter, 2019

University of California
Agriculture and Natural Resources | Cooperative Extension

In This Issue

Submitted by:

Sarah Light
UCCE Farm Advisor
Sutter-Yuba and
Colusa Counties

Good luck, Mariano!

We are sorry to announce that Mariano Galla, Agronomy Weed Science Advisor for the Sacramento Valley has taken a job with industry and has moved out of state. We wish him well in his new career ahead and hope to see his position refilled.

Meeting Announcements!

Save the Dates!

Wheat Field Day in Colusa County
Tuesday, March 12th ~ 9:00-11:00 am

We hope to see you there!

Topics Include:

- Optimizing Nitrogen Management in Small Grains
- Soil Nitrate Quick Test Demo
- Real Time Plant Sensing Using Hand-held Tools and Drone Imaging
- UC Small Grain Variety Testing Program and Resources

CCA Credits Approved: 1.5 Nutrient Management, 0.5 Crop Management
CURES Nitrogen Management Plan Credits: Pending

Contact Sarah Light, Agronomy Advisor, with questions: selight@ucanr.edu ~ 530-822-7515

Directions: Turn left on Wilson Bend Road off Highway 45 South. Follow UCCE signs.
(Lat/Long: 39.033851, -121.84004)

Soil, Water, and Pest Management Training for Field Workers in Spanish

Thursday March 14, 2019
8am-12pm: program, 12pm: lunch
142A Garden Highway, Yuba City
Contact Sarah Light, Agronomy Advisor, with questions: selight@ucanr.edu ~ 530-822-7515

UC Cooperative Extension will be providing a free, half day technical training in Spanish for field workers. Topics will include:

-Integrated Pest Management
-Avoiding pesticide resistance
-Soil fertility and soil management
-Plant, soil, and water dynamics

The focus of the training will be on agronomic crops, but everyone is welcome!

UCCE Instructors: Sarah Light, Agronomy Advisor ~ Luis Espino, Rice Advisor ~ Sam Sandoval, Water Resources Specialist

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Taller sobre suelos, agua, y plagas en español para trabajadores de campo

Jueves 14 de Marzo, 2019
8am-12pm: programa, 12pm: almuerzo
142A Garden Highway, Yuba City
Manden sus preguntas a Sarah Light, Agronomy Advisor: selight@ucanr.edu ~ 530-822-7515

La Universidad de California proveerá un entrenamiento gratuito en espanol para trabajadores de campo. Se cubrirán los siguientes temas:

-Manejo integrado de plagas
-Manejo de resistencia a los pesticidas
-Fertilidad y manejo de suelos
-Dinámica de suelos, plantas, y agua

El taller se enfocará en cultivos agronómicos, pero trabajadores de todos los cultivos son bienvenidos.
Instructores de UCCE: Sarah Light, Agronomy Advisor ~ Luis Espino, Rice Advisor ~ Sam Sandoval, Water Resources Specialist

Farmer to Farmer Field Day: All things Avian!

Tuesday March 19, 2019, 8:30 am-1 pm

Where: Windmill Feed, 23354 Co Road 95, Woodland, CA 95695 (Chamberlain Farms)
Cost: $15 per person (includes lunch and a copy of a new book on birds)
RSVP: https://www.wildfarmalliance.org/chamberlain_farms

Join us for an opportunity to learn more about birds on your farm, including birds of prey, like barn owls that feed on rodents, and insectivorous birds that feed on insect pests. There will also be a discussion about how to manage pest birds in crops, like starlings. Contact Rachael Long for more information at 530-666-8143.

New restrictions for chlorpyrifos (e.g. Lorsban) use in alfalfa in California

Rachael Long, Pest Management & Agronomy Advisor, Sacramento, Yolo, Solano Counties

An important change has come to California insect management for alfalfa and other crops. As of January 1, 2019, new restrictions on the use of chlorpyrifos (e.g., Lorsban and other products) for alfalfa have been imposed. This is likely to impact grower practices and strategies to address pest resistance issues. According to the California Department of Pesticide Regulation, DPR), chlorpyrifos can only be used in alfalfa under the following permit conditions:

- For control of alfalfa weevils, blue alfalfa aphid, and cowpea aphid (no other pests).
- The size of an application block cannot exceed 40 acres in a 24-hour period.
- 1,320-ft (1/4 mi) buffer zone around spray area, meaning no one can be present within 1/4 mile of the application area for 24-hours post treatment. Written permission from neighbors is needed if the application extends into neighboring property.
- No aerial applications.
- 48-hr NOI.
- 150-ft setback from sensitive sites (e.g. residences, schools, parks), where no chlorpyrifos can be used, even if the sensitive area is not occupied during the buffer zone period.

Chlorpyrifos is similarly restricted for use in almonds, walnuts, asparagus, citrus, vegetables, cotton, garlic, onions, grapes, and peppermint; check the permit conditions for each crop.

More information can be found at: **Chlorpyrifos Interim Recommended Permit Conditions.** These permit conditions are recommendations from DPR to Ag Commissioners. While commissioners have some discretion, according to DPR, they would need to justify implementing less stringent requirements. The restrictions include the use of mixtures with pyrethroids (products such as Cobalt or Stallion) that are used for weevil control, so check the label for chlorpyrifos.

What other insecticides are available for weevil control?

There are a limited range of alternatives to chlorpyrifos. Pyrethroids (e.g., Warrior) are still working well in the Central Valley, but are facing issues of pesticide resistance in the Intermountain area (specifically Scott Valley) and the Low Desert area (around Blythe). Steward (indoxacarb) works well, but it is a stomach poison and is slower acting during cooler weather when weevils are not feeding as much, so higher rates may be needed for good control. Some growers tank mix Steward with malathion or a pyrethroid to quickly knock down weevils for control during cooler temperatures, but this may promote resistance. Steward alone does not control aphids. Entrust (Spinosad) is available for weevil control for organic alfalfa production, with control at about 70% (suppression not control).

University of California Alfalfa Research Trials

We have conducted research trials for weevil control for many years at UC Davis and in several California locations to look for new products with new modes of action (MOA). So far, we have not come up with anything that provides better control than the pyrethroids and Steward as alternatives to chlorpyrifos. We will continue to conduct insecticide trials in 2019 and hope to find products with good efficacy on weevils.

What are the implications?

It is likely that many growers will find that these restrictions will severely limit or prohibit the ability to use chlorpyrifos in alfalfa on their farms in California. Keep in mind that chlorpyrifos was scheduled by federal EPA to be effectively banned nationwide (withdrawing of tolerance) in March 2017, but this decision was reversed by the Trump administration. A key challenge for growers will be the development of insect resistance with a limited range of MOAs available. Resistance has already been observed for pyrethroid insecticides at some locations. With the 'loss' of chlorpyrifos through highly restricted use, new MOAs are critically needed for alfalfa weevil control, which will be the focus of continued University of California research.

Spotlight on UC Cooperative Extension Resources

Nitrogen Management in Wheat

UC Cooperative Extension has resources on a wide range of topics related to agronomic crop production. For information on:

Top dressing wheat at tillering this winter check out this recent blog post about calculating growing degree days and optimal nitrogen application for your crop:

https://ucanr.edu/blogs/blogcore/postdetail.cfm?postnum=29300

Follow the link in that article for more details about the nitrate quick test, and the yield and quality benefits of an in-season top dress.

Integrated Pest Management (IPM)

Updated UC IPM Guidelines for Dry Beans for Weed Control, 2019

The Weed Management section of the UC IPM Pest Management Guidelines for Dry Beans has recently been revised and updated and is now available online at UC IPM Dry Beans Pest Management Guidelines.

Authors include Farm Advisors Kurt Hembree and Mick Canevari (emeritus). A highly useful addition includes a table providing information for registered herbicides and their specific time of use for the different dry bean types grown in California, including common beans, limas, blackeyes, and garbanzo beans. Also included is a new dry bean weed photo gallery, helping to identify and control some challenging weeds in beans, including nightshades, field bindweed, Johnsongrass, and nutsedge.

The UC IPM guidelines for dry beans have been fully updated and revised for all sections, including insects and mites, diseases, nematodes, and abiotic disorders, as of 2019. Thanks to the UC IPM staff and the UC ANR Grain-Legume workgroup members (http://agric.ucdavis.edu/) for all their efforts to provide a significant resource for the dry bean industry.

Resources for weed control

UC ANR's Weed ID/ Photo Gallery (http://ipm.ucanr.edu/PMG/weeds_intro.html), for identifying weeds common in California cropping systems in various stages of growth. Users can identify weeds using some of their most visible features such as: grass/ broadleaf, leaf shape, sap/ no sap, spines/ no spines

UC ANR Weed Blog https://ucanr.edu/blogs/UCDWeedScience/index.cfm, for up-to-date information on Weed Science issues and developments in California. Enter your email address in the 'subscribe' field at the top right-hand side of the page and validate your email to subscribe.

UC IPM Pest Management Guidelines https://www2.ipm.ucanr.edu/agriculture/, provides integrated weed management guidelines to crop-specific weed susceptibility tables, where users can find information on which herbicides are effective at controlling which weeds by crop type.

Lynn Sosnoskie, UCCE Agronomy Weed Science Advisor, San Joaquin Valley, 'Notes in the Margins' blog, provides regular updates related to weed science. Subscribe for updates.
https://ucanr.edu/blogs/SJVAgronomyWeedScienceBlog/index.cfm?start=6

New production manuals

Garbanzo (chickpea) production in California, 2019

A new resource on garbanzo production in California has been produced by the UC ANR Grain-Legume workgroup team (http://agric.ucdavis.edu/). This publication (#8634) can be found online at https://anrcatalog.ucanr.edu/Details.aspx?itemNo=8634 (free download).

Authors include Farm Advisors R Long, M Leinfelder-Miles, K Mathesius, and S Light, UC ANR Irrigation Specialist K Bali, and UC Davis emeritus Soils Specialist R Meyer. This production manual includes information on garbanzo varieties grown in California, nutrient and irrigation management for both subsurface drip and flood irrigated fields, and well as information on pest, weed, and disease management. We've been working on this production manual for over 25-years, so it's a big accomplishment to finally have it available as a resource for the dry bean industry.

Sunflower Hybrid Seed Production in California, 2019

A new resource on hybrid sunflower seed production in California will be available later this month. Look for this publication online in the UC ANR catalog, searching for #8638, https://anrcatalog.ucanr.edu/. Authors include Farm Advisors R Long, S Light, and K Mathesius, as well as USDA emeritus Plant Pathologist T Gulya, Irrigation Specialist K Bali, and UC Davis emeritus Soils Specialist R Meyer, along with extensive contributions from the sunflower seed industry. A significant resource includes information on irrigation and nutrient management as well as a color guide to insect pests, diseases, and weeds of concern for hybrid sunflower seed production.

With SWEEP and HSP Grant Deadlines Approaching, help is available: Introducing Emily Lovell

Emily Lovell has joined the team at the UC Cooperative Extension Capitol Corridor office in Woodland to help growers through the grant application process for the Healthy Soils Program (HSP) and Sustainable Water Efficiency and Enhancement Program (SWEEP). Both the HSP and SWEEP programs are offered by CDFA (CA Dept Food & Ag) to support farm conservation practices.

HSP provides grants of up to $75,000 to support conservation goals including healthier soils, carbon sequestration, and reduced greenhouse gas (GHG) emissions. There are a wide range of eligible projects, including cover cropping, mulching, no-till conversions, strip-cropping, or compost applications. Other projects supported include: filter strips, riparian herbaceous cover, and windbreaks. Full details on eligible projects can be found on pages 6 and 7 in the HSP Request for Grant Applications.

SWEEP program grants give growers a chance to upgrade or expand their irrigation/ pump infrastructure for GHG and/ or water conservation. Examples of eligible project areas include: weather, soil or plant-based sensors for irrigation scheduling; micro-irrigation/ drip systems; converting pumps from diesel to electrical, low-pressure systems, variable frequency drives, or improved pump scheduling. Full details on eligible SWEEP projects can be found on pages 3 and 4 in the SWEEP Request for Grant Applications.

As with any grant application, there are certain restrictions and specifics that apply and understanding the details is critical in preparing a successful grant. Emily Lovell is one of many resources that are available to growers for both the SWEEP and HSP grants (click the links for additional resource contacts for each of the grants).

Application deadlines for both the HSP and SWEEP grants are fast approaching (March 8th 2019). Don't hesitate to call on resources available to you from UCCE and CDFA.

Contact: Emily Lovell, UCCE Capitol Corridor SWEEP and HSP Grant Specialist
70 Cottonwood St., Woodland, CA
530.405.9997 / ejlovell@ucdavis.edu

Soil Sampling: A Review and Resources

Sarah Light, Agronomy Advisor, UCCE Sutter, Yuba, Colusa Counties
Daniel Geisseler, Assistant Cooperative Extension Specialist, UC Davis

Overview:
The agronomist I worked with in graduate school used to say, "you should pay the person who does your soil sampling a $100 an hour." What did he mean by this? You can spend money on all the lab analyses you desire but at the end of the day, the results are only useful as your sampling methodology.

What are we interested in when we collect soil samples? Soil samples in the root zone can tell us what is happening where crop uptake of nutrients occurs, so that soil fertility can be optimized. The California Fertilization Guidelines have crop specific information about crop rooting depth and optimum sampling depth: https://apps1.cdfa.ca.gov/fertilizerresearch/docs/guidelines.html

Collecting a sample that represents your field:
Soil samples should be collected from areas that are representative of the field. If there is a part of the field with a different soil texture, cropping history, or other factor (slope, etc.), those areas should be sampled separately because they can affect the soil analyses. For example, if a field was half in corn and half in beans, the residual nitrogen in the different areas may be different. Taking a composite sample across both areas will likely mean that you underestimate nitrogen availability in the area where beans were grown, while you overestimate nitrogen availability in the part that was under corn. Low points in the field can accumulate nutrients, or be water logged for part of the year, which can impact nutrient availability. If there is no variability in the field, one composite sample can be taken. The NRCS has mapped agricultural soils. If you haven't already, take the time to look up the soil maps of your farm to see where soil textures differ: https://casoilresource.lawr.ucdavis.edu/soilweb-apps

Now that you know where to sample, and to what depth here's how to do it:

The goal of soil sampling is to get a representative sample of what crop roots throughout the field will be able to access. Some soil nutrients, like nitrate, can be spatially variable even within a management area. This can be the result of an array of soil factors like crop residue, microbial activity, soil moisture, etc. What this means is that if you do not collect enough samples, you may be either over or under representing the nutrients in a field. To capture the average through a field, collect soil cores at a *minimum of 20 points* in the field. More also works great, but with less you run the risk of not adequately capturing the in-field variability because one core with very high or low nutrient levels can skew your average.

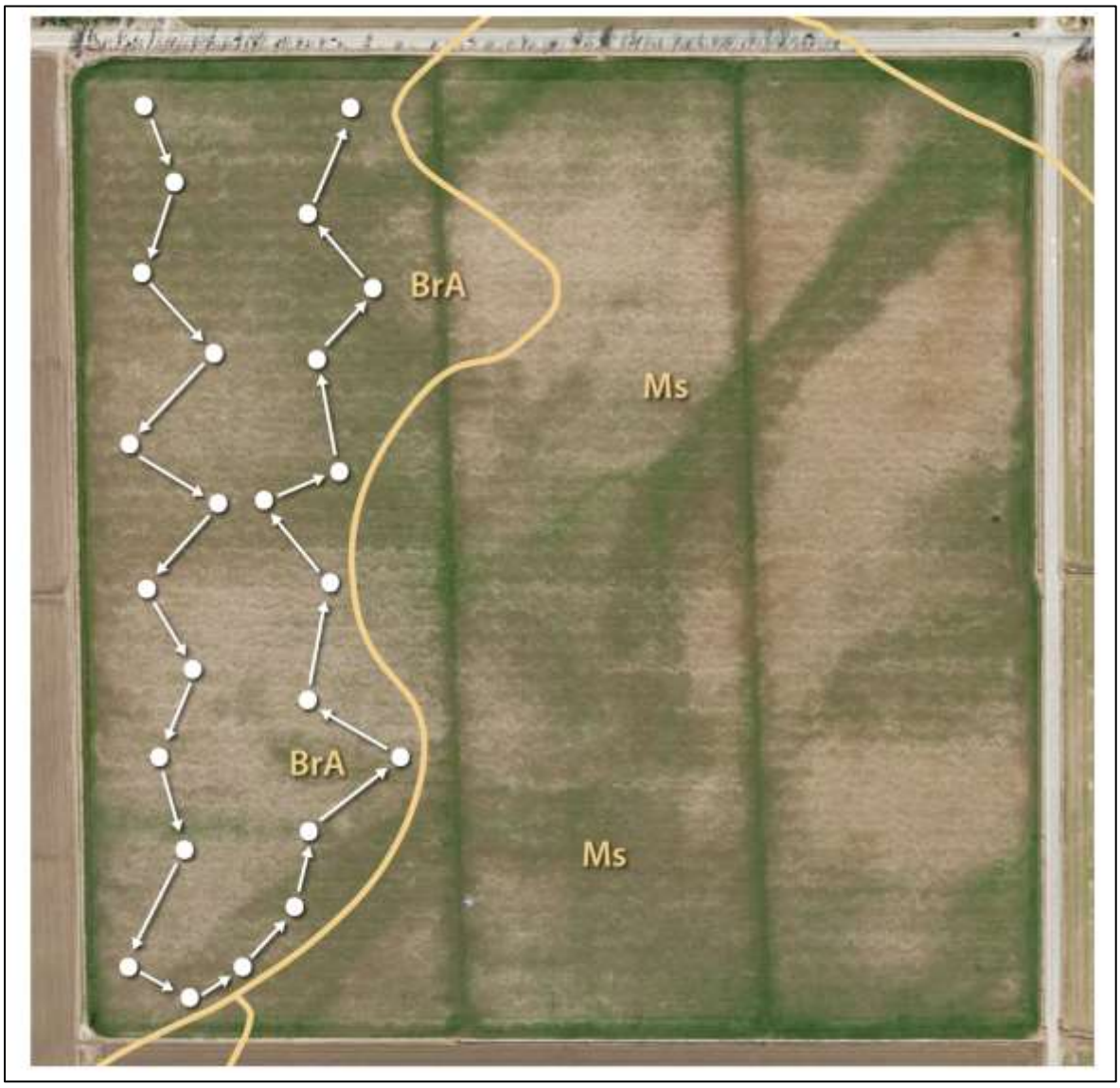
To collect soil samples you need a clean soil probe or auger and a clean bucket. Start in one end of the area you are planning to sample. You want to collect samples from the entire area you plan to sample, so try to space the sampling points accordingly. Walk in a zigzag pattern throughout the field and collect cores in a consistent way. Avoid collecting crop residue with your sample. Once you have collected all of your cores, mix the soil sample well with the goal of creating one, homogenized sample that represents the entire sampling area. Then, collect a subsample of this larger sample to send to the lab for analysis. Microbes favor warm, moist conditions. When sampling for residual soil nitrate, you will want to slow down microbial activity as soon as samples are removed from the field to capture what the root sees in the field. For this reason, the final soil sample should be kept cool and sent to the lab for analysis as soon as possible.

Soil sampling protocol may need to be modified depending on your management practices. For example, no till farming can lead to stratification in pH and other soil nutrients and might require the protocol above be followed for different depths. In this case, simply carry two buckets during sampling, one for each depth, and follow the methods outlined above.

More information about sampling and interpretation of soil nitrate specifically can be found here: https://ucanr.edu/repository/fileAccessPublic.cfm?fn=ca2016a0027-163002.pdf

Another great resource with comprehensive information on soil testing for phosphorous and potassium for annual crops can be found here: https://ucanr.edu/repository/fileAccessPublic.cfm?fn=ca2016a0007-161908.pdf

Contact your Agronomy Advisor for questions about soil sampling and interpretation.



Soil sampling plan to obtain a representative sample from a field or management area. The sampling points are shown on a Google map using the SoilWeb application (available at casoilresource.lawr.ucdavis.edu/soilweb/). The two soil series, Brentwood silty clay (BrA) and Myers clay (MS), are best sampled separately. *(From Geisseler and Miyao, 2016)*

Weed control in dry bean production

Rachael Long, Agronomy Advisor, Sacramento, Yolo, Solano Counties

Weeds are challenging to control in dry beans because there are limited herbicides available once the crops have established. Tough to control weeds include summer annuals, such as nightshades and groundcherry that can stain and reduce bean quality at harvest, and perennials such as nutsedge, Johnsongrass, field bindweed, and bermudagrass. Dry beans grown in California include common beans (kidney, pink, white, cranberry, black turtle), limas (baby and large), garbanzos (chickpeas), and blackeyes (cowpeas).

A standard weed control program for dry beans (especially common, lima, and blackeyes) includes the use of pre-emergent herbicides mechanically incorporated into beds prior to planting. Table 1 shows a list of registered pre-plant herbicides for different bean species including common beans, limas, blackeyes, and garbanzos. Each bean class has a specific pesticide label defining use (herbicide registration depends on bean species).

Garbanzos have a long growing season, requiring both winter and summer weed control. A standard weed control practice for garbanzos is to plant the beans, then apply herbicides over the beds before crop and weed emergence. The herbicides are activated by a half-inch of rain or sprinkler irrigation (Table 2). Growers often use Chateau and Prowl or Goal and Prowl (applied within 2 days after planting), though Goal can injure the bean crop. However, the garbanzos plants will recover from the injury, with no impacts on bean yield or quality at harvest.

Weed control post- plant post- emergence is challenging because there are few broadleaf herbicides for controlling weeds in established dry bean fields (Table 3). BASF brought back a label for Basagran last year for common beans and limas in California. However, plant injury can still occur, so it is imperative that the bean stand is healthy before using this herbicide, to make sure the plants quickly recover and grow out of the injury, or yield losses will occur. Hooded and/or directed sprays are also available for other broadleaf herbicides, including Shark and Sandea (do not apply on the crop or phytotoxicity will occur). Grass weeds can readily be controlled with Poast or SelectMax.

More information on managing weeds in dry beans can be found in the UC IPM Guidelines for Weed Management in Dry Beans, http://ipm.ucanr.edu/.

Table 1. Herbicides labeled for weed control- preplant, mechanically incorporated, by bean class.

✓= registered label use	**Common bean kidney, pink, etc.**	**Lima, baby, large**	**Blackeye cowpea**	**Garbanzo chickpea**
Preplant - mechanically incorporated				
EPTC (Eptam 7E)	✓			
ethalfluralin (Sonalan)	✓	✓	✓	
pendimethalin (Prowl H2O)	✓	✓	✓	✓
s-metolachlor (Dual Magnum)	✓	✓	✓	✓
trifluralin (Treflan)	✓	✓	✓	✓
metribuzin (Metribuzin)				✓

Table 2. Herbicides labeled for weed control after planting but before crop and weed emergence by bean class.

✓= registered label use	Common bean kidney, pink, etc.	Lima, baby, large	Blackeye cowpea	Garbanzo chickpea
After planting - before crop and weed emergence				
flumioxazin (Chateau SW)	✓	✓	✓	✓
pendimethalin (Prowl H2O)	✓	✓	✓	✓
metribuzin (Metribuzin)				✓
oxyfluorfen (Goal)				✓

Table 3. Herbicides labeled for weed control after planting, after crop and weed emergence by bean class.

✓= registered label use	Common bean kidney, pink, etc.	Lima, baby, large	Blackeye cowpea	Garbanzo chickpea
After planting - after crop and weed emergence				
bentazon (Basagran)	✓	✓		
carfentrazone (Shark EW)*	✓	✓	✓	✓
halosulfuron (Sandea)*	✓	✓	✓	✓
clethodim (Select Max)	✓	✓	✓	✓
sethoxydim (Poast)	✓	✓	✓	✓
fluazifop (Fusilade DX)	✓	✓		✓

*Hooded and/or directed sprays only, row middles (do not apply to the crop or injury will occur)

Vegetated filter strips for water quality protection on farms

Rachael Long, Agronomy Advisor, Sacramento, Yolo, Solano Counties
Sarah Light, Agronomy Advisor, UCCE Sutter, Yuba, Colusa Counties

The heavy rains this winter are a reminder of the need for erosion control in field runoff. Planting grasses in sub-drains can help trap sediments, infiltrate water, and absorb potential contaminants prior to water flowing from fields into main drains. These vegetated filter strips help reduce pesticides, nutrients, and sediments in irrigation and storm water runoff from fields (Figure 1). For example, local Sacramento Valley studies have shown grass filter strips can reduce sediments and associated pesticides in runoff by 60%.

For furrow-irrigated fields, filter strips in sub-drains can capture and infiltrate water at the ends of fields as it flows off fields through the strips, following the grade of the field, before discharging into a main drain. Filter strips need to be wide enough to maintain a sheet-like flow at or below the height of the vegetation, to provide adequate contact between the flowing water and the grass. This will ensure water is not flowing over the top of the strip but rather filtering through. The site selected for a filter strip should be well drained with little ponding of water or plant dieback will occur, reducing its function. As a rough estimate and guideline for sizing filter strips, local Sacramento Valley studies show that about 1,450 square feet (0.03 acre) of grass-lined drainage ditches are needed per 100 gpm of runoff to be effective.

Vegetated filter strips are most effective when planted with perennial grasses such tall fescues (endophyte free if grazed as a forage) and perennial ryegrass. These grasses are hardy and will grow quickly to form a thick thatch to filter and trap

sediments and other contaminants. For example, nutrients like phosphorus will be taken up by the grasses as they grow. In addition, microbial activity is increased in the root zone of the filter strip, which accelerates the decomposition of contaminants captured. Creeping wildrye, is a native perennial grass that would also work well as a filter strip, but is very slow to establish.

The area selected for a filter strip should be disked and shaped to carry water and a seedbed prepared. Grasses should be planted in the fall when establishment of most grasses is favored by cool weather and subsequent winter rains. After a seedbed is prepared, allow the winter rains to bring up the first flush of winter weeds. These should then be either sprayed with glyphosate or lightly harrowed for weed control and then the grasses broadcast or direct seeded with a grain drill at 15 lbs/acre by late fall. Once the grasses have established, they will outcompete weeds, requiring only occasional use of broadleaf herbicides or hand weeding.

Vegetated filter strips are supported by CDFA's Healthy Soils Program (HSP). For more information on filter strips, see UC ANR publication no. 8403, Protecting surface water from sediment-associated pesticides in furrow-irrigated fields, by R Long. https://anrcatalog.ucanr.edu/Details.aspx?itemNo=8403

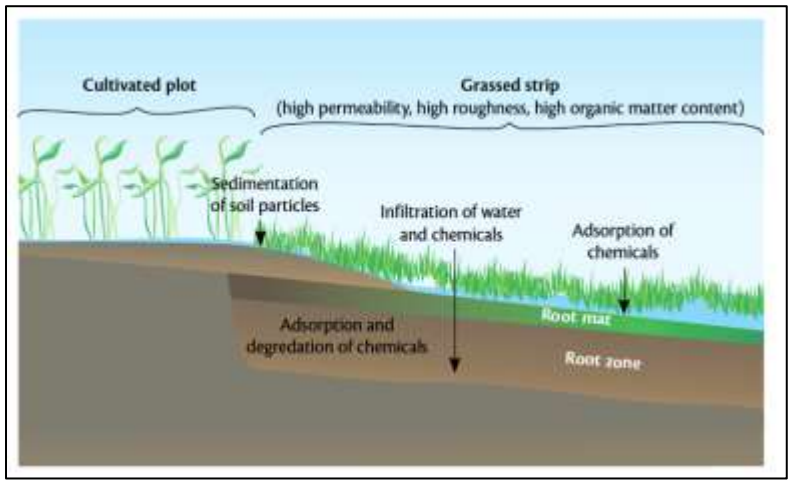


Figure 1. Process in a grassy filter strip that reduces sediments and other potential contaminants in irrigation or storm water runoff.

Grass filter strip along a roadside, Yolo County