Imperial County Agricultural Briefs

University of California
Agriculture and Natural Resources

Features from your Advisors

June 2017

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WEB-SPINNING SPIDER MITE MANAGEMENT IN ALFALFA SEED PRODUCTION

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Web-spinning spider mites are an annual problem for alfalfa seed producers in the low desert production areas of Southern California. Spider mites insert needle-like mouthparts into leaves, removing plant sap and causing chlorotic spot stippling on leaves. Severe feeding damage may turn leaves yellow, then brown from desiccation, causing defoliation. Damage usually starts in the lower plant canopy and moves upward as the mites move to new leaves. Severe damage from feeding reduces alfalfa seed production. Several spider mite species are found in low deserts:

- Twospotted spider mite (*Tetranychus urticae* Koch)
- Carmine spider mite (*T. cinnabarinus* Boisdival)
- Strawberry mite (*T. turkestani* Ugarov & Nikolski)
- Desert spider mite (*T. desortorum* Banks)

A management plan should be developed prior to the start of alfalfa seed production. The plan should include the following components:

- Decision of returning to hay production, seed production or terminating the alfalfa after seed harvest (returning to hay production greatly limits choices of miticides).
- Survey surrounding crops and weeds as potential sources of spider mites.
- Dust mitigation (critical around alfalfa seed production fields).
- Abatement of sources of spider mites.
- Scouting plan for detection and treatment decisions for spider mites.
- Application of miticides as needed to prevent seed yield losses.

Crops such as melons and many weed species can harbor web-spinning spider mites and may become a source of infestation for alfalfa seed crops. Spider mites may also be harbored on the lower leaves of the alfalfa plant throughout the year. Applications of certain insecticides (organophosphate or pyrethroids) to control insect pests

during hay production (aphids, weevils, leafhoppers) or during seed production (lygus bug and stink bug), can flare spider mite populations via destruction of predators or through hormoligosis (chemical stimulation of increased egg production). Many predators feed on spider mites including western flower thrips, minute pirate bugs, bigeyed bugs and predaceous mites.

Web-spinning spider mite colony buildup is favored by dry dusty conditions. Dust from field roads drifting onto alfalfa plants may flare-up a web-spinning spider mite infestation. Treat field roads with water to minimize dust from vehicle traffic. Post speed limit signs (5 mph) on field roads.

Abatement of sources of spider mites is important to reduce the potential for migration into the alfalfa seed field. Abatement should include weed control and, if possible, removal or treatments of spider mites in surrounding crops such as melons.

Alfalfa seed production fields should be scouted twice weekly for spider mites beginning early season and continued until the crop is ready for harvest. Fields should also be monitored for spider mite predators such as western flower thrips, minute pirate bugs, bigeyed bugs, predaceous mites, and other predators. Proper scouting will lead to accurate assessments of spider mite pressure versus the predator population levels that may result in reduced use of chemicals through improved timing of applications. It may be practical to spot-treat only portions of a field where there are spider mite hot-spots.

When web-spinning spider mites are present in an alfalfa field prior to seed production, a miticide spray may be needed to prevent damage that leads to reduced seed yields. Stressing the alfalfa for water can stimulate bloom, but also favors the build-up of spider mites. Treat fields before populations reach damaging levels to maximize the efficacy of available chemicals. When possible, spot or strip treat localized spider mite infestations. Use ground application equipment when possible (prior to bee placement) to improve coverage. To prevent spider mite problems consider including a miticide with the first insecticide application for lygus bugs. There is research trial evidence indicating that an application with a highly efficacious miticide early in the season with the first lygus bug treatment can prevent damaging population levels of spider mites for the remainder of the seed

production season. Miticides registered for alfalfa seed production work best when used against low populations; none can resolve a significant spider mite problem.

Miticides that may be used in California for control of spider mites in alfalfa seed production.

Miticide	Rate/acre	REI	PHI
Declare (Gamma-cyhalothrin)	1.54 fl oz	24 hours	7 days
Onager (Hexythiazox)	10 fl oz – 24 fl oz	12 hours	14 days
Comite (Propargite)	½ -3 pts	21 days	0 days
Sulfur DF	3 lb – 5 lb	24 hours	0 days

REI = reentry interval

PHI = pre-harvest interval

IMPORTANT CONSIDERATION FOR GRASS WEED IDENTIFICATION

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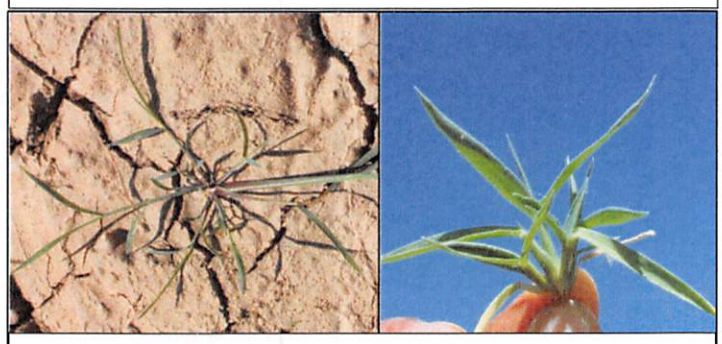
As the summer season is on its way, we might be encountering more grass weeds in the field and surroundings areas than in other seasons. In the low desert, grass weeds emergence is higher in the summer months than fall or spring. Summer annual grasses typically start emerging from March, they have pick emergence in June, and continue to grow until October. For successful weed management, it is very important to implement the control tools at the early stage of weed growth. If you are considering herbicide application for weed control, a general rule of thumb is to make an application when weeds are up to 3" and not more than 5" tall. Grass weeds are easy to identify when they are mature and have seed head; however, at this stage it is already too late to control them with herbicide application. At the early growing stage, it is often challenging and most of us struggle while identifying a grass seedling because of their similarity in morphology and shape across various species. Following certain key characteristics and structures can help us identify grass weeds at the early growth stage. In this article, I am presenting the general guidelines that will help to know some of the key features to look for for grass weed identification at the early stage.

Stem characteristics: There are some variations in stem shape depending upon the grass species. Some species have flat stem (ex. jungle rice) while others have round stem (ex. johnsongrass). The leaf of weeds in the sedge family (ex. nutsedge spp.) look similar to grass weeds; however, they have triangular stem. The stems of grass weeds also vary in color at the base, with some species with red base (ex. Mexican sprangletop), while others with green or light green base (ex. prairie cupgrass). Likewise, the presence or absence of hair on the stem is another key feature for grass weed identification (ex. prairie cupgrass vs jungle rice).

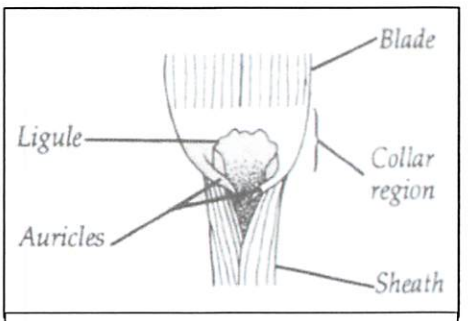
Stem shape: jungle rice (left) and johnsongrass (right)



Hairs on stem: Mexican sprangletop (left); prairie cupgrass (right)

Leaf characteristics: The leaves of grass weeds might look alike for all species, but there is considerable variation in size and arrangement. Leaf sheath of some weeds are rolled, while it is flat for some other species. Leaf hairs might be absent in some species (ex. barnyardgrass), but hairs might be present on upper, lower, or both sides (ex. prairie cupgrass) of the leaf blade. Leaves also vary at the base with some species having narrower bases (ex. sprangletop), while others might have a broader base (ex. canarygrass). The leaf length could be longer or shorter depending upon species. Some species have typical leaf characteristics such as water marks (ex. jungle rice), prominent white mid-vein (ex. johnsongrass), and auricles (Italian ryegrass).

Leaf collar region: Leaf collar is the section of leaf where blade meets the sheath (usually wrapped at the stem). There are lots of variations near the leaf collar and it might help in differentiating some grass species from others. Some species have lots of hairs (ex. yellow foxtail), some might have scanty hairs (bermudagrass) and some might be without hairs (ex. barnyardgrass) near leaf collar region.



Leaf structures of a typical grass weed

Ligules: Ligule is the structure present at the junction of the leaf base and leaf sheath and where the leaf attaches to the stem. The ligules are highly variable depending upon grass species and many grass weeds can be identified by knowing the ligule type. Some grass weeds have hairy (ex. bermudagrass) ligules; some have membranous ligules (ex. wild oat); and in some species ligules are absent (ex. barnyardgrass and jungle rice). Even within the weeds which have hairy or membranous types of ligules, there is a wide variation in shape, structure, and length of ligule.


Different types of ligules: bermudagrass (left); wild oat (center); junglerice (right)

References:

1. Weed Identification, University of Illinois. At: http://weeds.cropsci.illinois.edu/weedid.htm

2. Weed gallery, UCANR Statewide IPM Program. At: http://ipm.ucanr.edu/PMG/weeds_intro.html

3. Tickes B (2014). Summer weed control in alfalfa – low desert. Available at: http://alfalfa.ucdavis.edu/+symposium/proceedings/2004/04-95.pdf.

STRAWBERRY PRODUCTION IN THE COACHELLA VALLEY

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It took awhile for strawberry production to become an important crop in the Coachella Valley (see Table 1.) Weather in the Coachella Valley makes growing strawberries a challenge that few growers want to undertake. The growing season is relatively short compared to other growing regions, thus making the return on investment difficult. Harvest of fruit begins in December and production increases with the cool winter weather. But by March, the weather can begin to reach 100F bringing an end to the harvest if it continues to warm up. Changes in weather, warm days followed by cooler days, make for many sleepless nights (March to May) for the growers.

The fall 2016 to spring 2017 season had more rainfall than usual and with it more gray mold fungus: *Botrytis cinerea* outbreaks. It became a challenge to control gray mold because as soon as treatments began another rainstorm would go through the area. The constant rains and cool weather favored disease development. Gray mold can affect several parts of the plant from leaves, flowers and fruit. The fruit can be covered with mold that will readily infect nearby fruit. (See Figure 1,2) Losses to *Botrytis* can be significant even with fungicide treatments and also go on to cause postharvest losses.

Table 1. Coachella Valley Strawberry Gross Value and Acreage

YEAR	US DOLLARS GROSS VALUE	ACREAGE
2003	4,820,600	287
2002	3,332,000	214
2004	6,327,500	351
2005	5,901,500	319
2006	4,307,000	353
2007	2,329,000	274
2008	2,170,100	271
2009	3,314,200	236
2010	3,832,539	318
2011	11,344,614	363
2012	16,126,662	430
2013	27,528,540	580
2014	26,258,000	619
2015	13,257,000	322
	14 YEAR AVERAGE GROSS VALUE PER ACRE	**14 YEAR AVERAGE ACREAGE**
	$26,504	353

Data from Riverside County Agricultural Commissioners'' Crop Reports

Figure 1. *Botrytis* infecting mature fruit but will also infect nearby fruit.

Figure 2. Gray mold is a common problem in all strawberry production areas.

When the weather is favoring disease development, growers must review all the treatment options. For a listing of treatment options see **Botrytis Fruit Rot of Strawberry** by Steven T. Koke and Mark Bolda. Here is a link to that publication:

http://ucanr.edu/blogs/strawberries_caneberries/blogfiles/37846.pdf

Good plant coverage of materials is critical. High disease pressure caused local growers to shift from Electrostatic sprayers to more conventional sprayers and to spend more time scouting fields. Organic growers do not have effective fungicides available. Sanitation, such as removing infected fruit from the field, helps but are expensive and not as effective as a fungicide program.

Strawberry production depends on the varieties developed from several University strawberry breeding programs and from proprietary (private) varieties. Not all strawberry varieties have proved adaptable to desert soils and climate. There are currently no varieties resistant to gray mold. Careful use of fungicides with various modes of action is critical to reduce the risk of resistance to these materials. Before using any materials, check labels for the latest information on its use and registration.

CIMIS REPORT AND UC DROUGHT RESOURCES

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California Irrigation Management Information System (CIMIS) is a statewide network operated by California Department of Water Resources. Estimates of the daily reference evapotranspiration (ET_o) for the period of June 1 to August 31 for three locations in the Imperial County are presented in Table 1. ET of a particular crop can be estimated by multiplying ET_o by crop coefficients. For more information about ET and crop coefficients, contact the UC Imperial County Cooperative Extension Office (352-9474) or the IID, Ag Water Science Unit (339-9082). Please feel free to call us if you need additional weather information, or check the latest weather data on the worldwide web (Google CIMIS for the current link to CIMIS site).

Table 1.Estimates of daily Evapotranspiration (ET_o) in inches per day

Station	June		July		August	
	1-15	16-30	1-15	15-31	1-15	16-31
Calipatria	0.39	0.40	0.39	0.38	0.35	0.32
El Centro (Seeley)	0.36	0.38	0.38	0.37	0.32	0.29
Holtville (Meloland)	0.38	0.39	0.39	0.38	0.34	0.31

* Ag. Water Science Unit, Imperial Irrigation District.

Water and Drought Online Seminar Series

The latest research-based advice on weathering a drought is now available free online. The UC Division of Agriculture and Natural Resources is working to help farmers cope with the unwelcome outcome of historically low rainfall the last three years. UC scientists, with support from the California Department of Water Resources, have recorded video presentations on high-priority drought webpages.

Each presentation is about one half hour in length and is available at the link below:

http://ciwr.ucanr.edu/

Then click on the drought resources link.