

**COOPERATIVE EXTENSION  
UNIVERSITY OF CALIFORNIA**

*From Your Farm Advisors*

***Features***

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## PROBLEMS WITH PLANTING SUDANGRASS AFTER WHEAT



**Herman Meister**

Sudangrass acres in the Valley have increased this year. The production problems in other areas have resulted in a more favorable market this season. Earlier in the spring, sudangrass was planted following produce, oats for hay, and more recently wheat and sugar beets.

Each of these scenarios has a set of issues to deal with. Produce crops historically have adequate carry-over of fertilizer to maintain the first cutting of sudangrass. Getting a good seed bed behind produce can be challenging at times due to harvesting roadways and wet ground. Successful sudangrass production following wheat depends disposition of the wheat straw. Some of the ways to dispose of the straw are 1) baling the straw and discing the stubble, 2) spreading and discing in the straw, 3) and burning the straw. Spreading the straw and discing or just discing in the stubble can result in yellowing of the emerging sudangrass crop. Most of the time, the yellowing is due to a phenomenon called “immobilization” of the nitrogen (N).

Immobilization of nitrogen is favored by the addition of high C:N ratio residues (wheat straw) which causes soil microbes to take up all the nitrogen in the soil to break down the straw. Soil microbes can out compete the sudangrass plants for N resulting in less N for the sudangrass. Prematurely irrigating to add more N can delay the microbial process and can cause an anaerobic condition. There is also the risk of the N being released toward the end of your cutting resulting in too high of nitrogen content at harvest.

Burning removes the residue and eliminates the immobilization of N to a large degree. The location of the field for burning and the time lost waiting to burn the field can hamper this process. Only 500 acres in each of the 4 zones of the Valley can be burned on a designated “burn” day. If the field can be burned and planted with a minimum till type of planter with N fertilizer added to the seed line, the crop will be off to a good start. A modification of this approach is to swath the stubble close to the ground after the combines have harvested the grain and bale the straw. Then the sudangrass is planted the same way as behind the burned fields. Dry fertilizer can be spread as an alternate source of N fertilizer if the liquid for is not preferred.

A common practice currently is to disk in the wheat residue, plant the sudangrass and run 100 lbs of NH<sub>3</sub> in the germination water. Some of this fertilizer is volatilized, and this large amount is a shock to the soil microbe complex. It takes a few days for the soil fauna to recover, then immobilization occurs, the crop turns yellow, and time is lost.

The key to avoid yellowing and immobilization of N is to manage and or remove the wheat stubble/straw from the fields. The microbes will not tie up the N and the sudangrass will grow favorably.



## WEST NILE VIRUS

**Juan N. Guerrero**



In 1999, a new zoonotic disease (a disease transmittable between animals and humans) became established in the U.S., West Nile Virus (WNV). WNV first appeared in the northeastern states and has quickly spread throughout the South, and may appear in California soon. Wild birds, principally the corvids; such as ravens, crows, jays, and magpies; are the main carriers of WNV. One of the great plagues of humanity, the mosquito, is the principal vector between birds and humans.

To transmit the disease, a mosquito must first feed on an infected bird. The virus then migrates to the salivary organs of the mosquito. When an infected mosquito then goes to its next blood meal, perhaps a human or a horse, it injects saliva into the host animal and then the host becomes infected by WNV. Human-to-human, horse-to-horse, or horse-to-human transmission does not occur generally.

Most people and horses that contract the disease do not suffer any symptoms. For those people that do develop the illness, the symptoms may be fever, nausea, headache, or a skin rash. For those that contract the disease, from the mosquito bite to the onset of the

illness, the time frame may be 5 to 15 days. In 2002 in the U.S., there were more than 4,000 confirmed cases of WNV, of which about 6% died. The elderly and those with weak immune systems are particularly vulnerable. There are no treatments for WNV in humans.

WNV was first identified in Uganda in 1937 and spread throughout Africa. WNV traumatized the Northeast in 1999, and is moving progressively westward with ordinary bird migrations.

Horses are vulnerable to WNV. As with humans, most infected horses do not develop the disease. About 25% of affected horses develop the disease. However, for those horses that develop the disease, the symptoms are ataxia (un-coordinated muscle movements) inability to stand, paralysis, or acute death. Of horses that develop the clinical disease, about 20 to 40% die. Fortunately, a California-approved vaccine to prevent WNV is available from licensed veterinarians. The westward progression of WNV infected birds is perhaps unavoidable. As mosquito season advances, so will the possibility that WNV might affect the local area. Contact your local veterinarian to vaccinate your horses.

The only possible preventative measures are mosquito prevention measures:

Reduce mosquito-breeding areas –

- ♦ remove standing water, such as in old tires, cans, wheelbarrows, etc.
- ♦ clean bird baths and dog water basins frequently

Reduce your exposure to mosquitos –

- ♦ if WNV becomes established locally, outdoor screens and shade cloths may become necessary near horses and around homes
- ♦ at dawn and at dusk, use mosquito repellent

The California Department of Food and Agriculture has an excellent web educational site on WNV.



## THE CROP IS TURNING YELLOW

**Keith S. Mayberry**

Farmers usually check their fields every other day at the minimum. Some crops such as wheat, asparagus, alfalfa, and sugar beets may get less frequent checks. On occasion, the farmer is concerned when the field is starting to turn yellow. The immediate reaction is to apply water and nitrogen fertilizer. Let's take a look at the symptoms and conditions that call for this action. Or is something else causing the problem?

**Nitrogen Deficiency** ▪ The normal symptoms of nitrogen deficiency are overall stunting in growth and the roots are not as extensive as they should be. The leaves develop a more-or-less uniform yellow color (sometimes yellow-green). Older leaves are especially affected. Under severe conditions, the leaves start to drop off. If nitrogen is needed, then adding this nutrient will stimulate growth. The way to tell if nitrogen deficiency is the cause is to take a plant sample according to the recommendations of the diagnostic laboratory that you choose to use. If the results of the test show the nitrogen level is adequate, then do not apply more fertilizer. You can also rely somewhat on what your fertilizer practices have been for this crop and the preceding crop. If the crop, such as lettuce, had 100 pounds actual nitrogen applied with the preplant phosphate fertilizer, and you have already applied 60 pounds nitrogen as a sidedress of 20% ammonium nitrate liquid, then the chances the lettuce crop is yellow due to nitrogen deficiency is slim.

Caution: Overdose of nitrogen can be worse than a deficiency. Excess N can delay maturity in some crops. It can lower overall quality in many crops including sudangrass. It can in some instances increase susceptibility to plant diseases.

**Excess Water** ▪ Applying more water when the soil is wet can be harmful to the crop. Wet soils have low oxygen content. This can cause oxygen starvation to plant roots called "anoxia". Fertilizer can be lost due to a biological process called "denitrification" or leached from the soil as nitrate-nitrogen. Soil that is wet for a prolonged period of time tends to affect crops by inducing more root rot diseases than with soils that are moist or starting to dry. Therefore, do not water more than you would under normal conditions. Crops tend to be yellow in wet soils since the root systems become impaired and nutrient uptake is reduced, not because the nutrients were not already present in the soils.

**Plant Disease** ▪ Many kinds of plant diseases can cause leaf yellowing, leaf drop, leaf scorch, and overall poor growth of the crop. Be sure to look for symptoms of foliar diseases and root rot diseases. You may choose to have your crop pest control consultant walk the field and make an evaluation. Make your decisions according to the results of the evaluation.

**Micronutrient Deficiency** ▪ A deficiency of some kinds of micronutrients can cause yellowing in plants, particularly zinc or iron. Yellowing between the veins in leaves and scorching of the leaf margins characterize zinc deficiency. Initial yellowing or white tissue between leaf veins followed by death of the tissue characterize iron deficiency. Interveneal yellowing and mottling of young leaves characterize manganese deficiency. *It should be pointed out that micronutrient deficiencies are extremely rare in Imperial Valley.*

**Other Causes of Yellowing** ▪ Other potential causes of yellowing are herbicide injury, toxic affects of some pest control chemicals, severe nematode infestation, and wind whip.



## CUTWORM MANAGEMENT IN ALFALFA

**Eric T. Natwick**

Cutworms are frequent pests in low desert alfalfa planted on beds, but can also infest alfalfa planted between borders. Granulate cutworm, *Agrotis subterranea* (Fabricius), and the variegated cutworm, *Peridroma sausia* (Höbner), are the two species that most commonly attack desert alfalfa. Cutworm adults are night-flying moths in the Family: Noctuidae. The white or greenish eggs of these noctuids are laid singly or in irregular masses, on alfalfa leaves or stems often near the base of the plant. The eggs darken as they approach hatching due to the developing head capsule. Larvae can grow up to 2 inches long. The heavy-bodied larvae appear as smooth-skinned caterpillars of various colors and patterns. Larvae frequently roll into a C-shape when disturbed. Cutworm larvae hide under loose soil, in soil cracks or under duff during the day, move to the plants at night to feed.

Variegated cutworm populations may develop in weedy areas and migrate into seedling stands or mature stands, but granulate cutworm moths usually deposit their eggs directly on alfalfa plants. Seedling alfalfa stands can be severely damaged by cutworms cutting the seedlings off at or just below the soil surface. Established fields are damaged when cutworms cut off new growth of feed on the alfalfa foliage.

Granulate cutworm is a devastating pest of bed planted alfalfa. Low desert alfalfa fields are attacked by granulate cutworm from May through October, but the pest is resident in fields throughout the year. Established alfalfa fields can be severely injured when cutworms cut off new shoots at or below ground level following hay harvest. The pest often goes undetected after cutting and hay removal. The problem becomes apparent when the field is watered back and there is little or no re-growth due to cutworms feeding. Cutworms feeding on shoots, holding back re-growth, deplete starch reserves in the crowns, weakening the plants, making them susceptible to disease. Granulate cutworm is nocturnal, but will move from daytime hiding places and climb into the alfalfa canopy to feed in the evening.

**Management guidelines.** Cutworms are most injurious in fields with high plant residue. Pre-plant tillage and abatement of weedy refuge areas around fields help prevent cutworm infestations. Flood irrigation will drown many cutworm larvae. Flood irrigation during daylight hours will attract Egrets, Ibis, gulls and other birds that prey on the cutworm as the advancing water forces the larvae from hiding. Monitoring and treatment guidelines have not been established for cutworms in desert alfalfa. Look under duff and carefully dig to a depth of one inch deep in loose soil near alfalfa crowns detect cutworms. When cutworm numbers exceed one or two per foot of row or severe damage is apparent, treatment with an insecticide is usually warranted. It is important to detect cutworm infestations early. Larger cutworms in the fourth or fifth instar of development cause most of the damage and are more difficult to control. Pyrethroid insecticides and endosulfan were the only efficacious insecticides for control granulate cutworm in the low deserts until recently. Steward is a newly registered insecticide that can also be used for control of cutworms in alfalfa.



**IMPERIAL COUNTY ONION DOWNY MILDEW RESEARCH RESULTS, 2003**

**Thomas A. Turini**

The effect of fungicides, application timing and fungicide rotations on downy mildew severity was compared at Imperial Valley Research Center in Brawley, CA. On 17 Oct 2003, dehydrator onion seed was sown and irrigated. Beds were spaced 40 in. center to center by commercial practice. Each plot consisted of four rows 30 feet long. The experimental design was

a Randomized Complete Block with six replications. Materials were applied in 30 gallons of water per acre with a CO<sub>2</sub> pressurized backpack sprayer at 30 psi.

Disease pressure was high with nearly 40% of leaf surfaces being damaged by the disease in the untreated control. Of the products tested, Ridomil Gold Bravo alternated with Maneb, Maneb and Ridomil Gold Bravo provided excellent control of the disease under the conditions of this study.

<i>Treatment, units/acre (dates of application)</i>	<i>Number of leaves with sporulation/ 50 ft<sup>x</sup></i>		<i>Leaves with lesions (%)<sup>y</sup></i>
	<i>14 Mar</i>	<i>25 Mar</i>	<i>4 April</i>
<i>Ridomil Gold Bravo 2.0 lbs (10 Feb, 11 Mar), Maneb 3.0 lbs (28 Feb, 21 Mar)</i>	3.0 cde <sup>z</sup>	2.8 cd	1.9 d
<i>Maneb 3.0 lbs (14, 28 Feb, 11, 21 Mar)</i>	0.2 f	1.2 d	6.6 cd
<i>Ridomil Gold Bravo 2.0 lbs (14, 28 Feb, 12, 21 Mar)</i>	4.0 cdef	6.3 bcd	6.5 cd
<i>Ridomil Gold Bravo 2.0 lb (10, 28 Feb, 11, 21 Mar)</i>	0.3 ef	3.5 bcd	8.6 c
<i>Dimethomorph 6.4 oz (14 Feb, 11 Mar) BAS 516 1.45 lbs/acre (28 Feb, 21 Mar)</i>	2.2 def	6.7 bcd	21.3 b
<i>Dimethomorph 6.4 oz + Cabrio 16.0 oz (14, 28 Feb, 11, 21 Mar)</i>	5.7 bcd	21.2 abc	34.4 a
<i>Ridomil gold Bravo 2.0 lbs (28 Feb, 21 Mar)</i>	12.8 ab	23.5 ab	34.6 ab
<i>Dimethomorph 6.4 oz (14, 28 Feb, 11, 21 Mar)</i>	6.8 bc	12.0 abcd	35.7 a
<i>Quadris 15.4 fl oz (14, 28 Feb, 11, 21 Mar)</i>	6.0 bcd	33.7 a	37.6 a
<i>Untreated Control</i>	13.8 a	31.0 a	39.4 a

- <sup>x</sup> The first sign of disease was observed on 11 Mar. On 14 and 25 Mar, the number of leaves with *Peronospora destructor* sporulation within 50 ft length of 30 in. bed were recorded.
- <sup>y</sup> On 4 April, the percentage leaf surface covered with downy mildew symptoms of each of 10 plants per plot was estimated and recorded.
- <sup>z</sup> Means within the same column followed by the same letter do not differ significantly as determined by least significant difference (LSD) P≤0.05. Means were subjected to arcsine transformation before analyzed. Non-transformed means are presented.



## CIMIS REPORT

**Khaled Bali and Steve Burch\***

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 July 1 to September 30 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, Irrigation Management Unit (339-9082).

The Irrigation Management Unit (IID) provides farmers with a weekly CIMIS update. Farmers interested in receiving the updated CIMIS report on a weekly basis can call the IID at the above number. Please feel free to call us if you need additional weather information, or check the latest weather data on the worldwide web (visit <http://tmdl.ucdavis.edu> and click on the CIMIS link).

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

Station	July		August		September	
	1-15	16-31	1-15	15-31	1-15	16-30
Calipatria	0.39	0.38	0.35	0.32	0.30	0.27
El Centro (Seeley)	0.38	0.37	0.32	0.29	0.29	0.26
Holtville (Meloland)	0.39	0.38	0.34	0.31	0.30	0.27

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*To simplify our information it is sometimes necessary to use trade names of products or equipment. No endorsement of named products is intended nor is criticism implied of similar products, which are not named*

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**Eric T. Natwick**  
**County Director**