


# Imperial County Agricultural Briefs

University of California Agriculture and Natural Resources
UC Cooperative Extension

## Features from your Advisors


## February 2022 (Volume 25 Issue 2)


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UNIVERSITY OF CALIFORNIA
Agriculture and Natural Resources | Cooperative Extension

CropManage

# CropManage Hands-on Workshop

Bringing Irrigation and Nutrient Management Decision-Support Tool to the Field

Date: Wednesday, February 9, 2022 8:00a.m.-12:00p.m.

Location: City of Coachella Corporate Yard, 53-462 Enterprise Way, Coachella, CA 92236

- Learn how to use CropManage to support irrigation and nutrient management decisions and record-keeping for your crops
- Learn about the latest updates to CropManage

**CropManage** is a free online decision-support tool for water and nutrient management of vegetables, berry, agronomic, and tree crops. Based on in-depth research and field studies conducted by the University of California Cooperative Extension, CropManage provides realtime recommendations for efficient and timely irrigation and fertilization applications while maintaining or improving overall yield.

At this **free** workshop, we will provide hands-on training so that you can learn to use the newest version of CropManage. Crops currently supported include many vegetables (carrots, broccoli, lettuce, spinach, tomato, etc.), berry crops (raspberry and strawberry), tree crops (almond, walnut, and pistachio), and agronomic crops (alfalfa and corn). CropManage is now also available in Spanish.

**Who should participate?** Growers, farm managers, other farm staff, crop advisors, consultants, and technical service providers are welcome. The workshop is for both new and current CropManage users.

**What to bring?** This is a participatory workshop. Please bring a tablet or laptop computer so that you can follow along and participate in the exercises. Each participant will need a user account for CropManage. Please set up a **free user account** at https://cropmanage.ucanr.edu/ before the workshop.

**Registration:** Please register at https://surveys.ucanr.edu/survey.cfm?surveynumber=36525 by February 7, 2022. Seats are limited to the first 25 registrants.

## Agenda

**8:00 a.m. - 12:00 p.m.**

8:00 – 8:20 Registration and computer set-up

8:20 – 8:40 Introduction

8:40 – 9:50 Getting started with CropManage

9:50 – 10:00 BREAK

10:00 – 11:00 Using CropManage for decision support and record-keeping

11:00 – 11:10 BREAK

11:10 – 11:40 Advanced features and interfacing sensors with CropManage 11:40 – 12:00 Discussion of new features and Q&A

For additional information on the workshop, please contact Dr. Ali Montazar at amontazar@ucanr.edu or (442) 265-7707.

PENDING CEU APPROVALS: CCA (2.5 hrs.)

**NOTE: The following COVID-19 guidelines will be applied to this training workshop.**

1. **Wearing a face covering during the workshop is required.**
2. **Stay at home if you have COVID-19 symptoms, tested for positive, and/or close contacts with or exposure to others who have been tested for COVID-19.**
3. **Face masks and sanitation items will be provided at the workshop.**

**CropManage Hands-on Workshop**

Bringing Irrigation and Nutrient Management Decision-Support Tool to the Field

Date: Thursday, February 10, 2022 8:00a.m.-12:00p.m.

Location: Farm Credit West, 485 Business Parkway, Imperial, CA 92251

- Learn how to use CropManage to support irrigation and nutrient management decisions and record-keeping for your crops
- Learn about the latest updates to CropManage

**CropManage** is a free online decision-support tool for water and nutrient management of vegetables, berry, agronomic, and tree crops. Based on in-depth research and field studies conducted by the University of California Cooperative Extension, CropManage provides realtime recommendations for efficient and timely irrigation and fertilization applications while maintaining or improving overall yield.

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**Registration:** Please register at https://surveys.ucanr.edu/survey.cfm?surveynumber=36443 by February 8, 2022. Seats are limited to the first 25 registrants.

## Agenda

| 8:00 a.m. - 12:00 p.m. |
|---|

8:00 – 8:20 Registration and computer set-up

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8:40 – 9:50 Getting started with CropManage

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**California Low Desert Virtual Alfalfa Production Meetings**

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***Meeting A Thursday Feb. 10 9 - 11:30 a.m.***

9:00 **Welcome** – Oli Bachie, UCCE Imperial County Director

9:05 **Update on Late Winter/Early Spring Pests of Alfalfa**. Michael Rethwisch, UCCE-Riverside Farm Advisor

9:35 **Alfalfa Leaf-Tier, a New Alfalfa Pest in the Low Desert.** Apurba Barman, UCCE-Imperial IPM Advisor

9:50 **Syngenta Alfalfa Portfolio**. Randy Landwerlen, Syngenta Crop Protection

10:05 **Alternative Forages – Results from Low Desert Trials**. Dr. Oli Bachie, UCCE Imperial County Director

10:25 Break

10:30 **Bayer CropSciences – Products for Alfalfa and Forages**. Ralph Land, Bayer CropSciences

10:45 **Management of alfalfa nutrients and pest in the low desert**. Dr. Ayman Mostafa, University of Arizona Area Programmatic Agent & Regional Specialist

11:15 **Corteva Products in Alfalfa/Forages**. Junior Evans, Corteva Agriscience

11:30 Wrap-up

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CEUs approved: CCA (1.5); AZ (2.0)

CEUs pending: DPR (2.0)

Registration link for Feb 10:

https://surveys.ucanr.edu/survey.cfm?surveynumber=36448

For more information, please contact Ali Montazar (amontazar@ucanr.edu) or Michael Rethwisch (mdrethwisch@ucanr.edu)

## California Low Desert Virtual Alfalfa Production Meetings

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***<u>Meeting B Thursday Feb. 17 8:30 - 12 noon</u>***

8:30 **Welcome** – Oli Bachie, UCCE Imperial County Director

8:35 **Alfalfa Weeds and Their Control**. Marco Pena, University of Arizona Assistant in Extension

9:05 **Cotton Root Rot in Low Desert Alfalfa.** Dr. Philip Northover, FMC Corporation

9:20 **Summer Cercospora and other Alfalfa Foliar Diseases**. Dr. Kevin Caffrey, BASF

9:50 **BASF Products and Usage in Alfalfa**. Jeff Boydston, BASF

10:05 Break

10:15 **FMC Forage and Alfalfa Products**. Brent Wolfe, Retail Market Manager, FMC

10:30 **Effective irrigation management practices in the desert alfalfa production system.** Dr. Ali Montazar, UCCE-Imperial County

11:00 **ProtecT - A newly registered product for gopher control in drip irrigation systems**. Doug Larson, Ag Water Chemicals.

11:15 **Results from Recent Summer Heat Mitigation Experimentation in Alfalfa**. Michael Rethwisch, Farm Advisor, UCCE-Riverside

11:30 **Seaweed Products for Stress Management.** Art Dawson, Dawson Company

11:45 Wrap-up and final instructions. Oli Bachie, UCCE Imperial County Director

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CEUs approved: CCA (3.0); AZ (2.5)

CEUs pending: DPR (2.25)

Registration link for Feb 17:

https://surveys.ucanr.edu/survey.cfm?surveynumber=36526

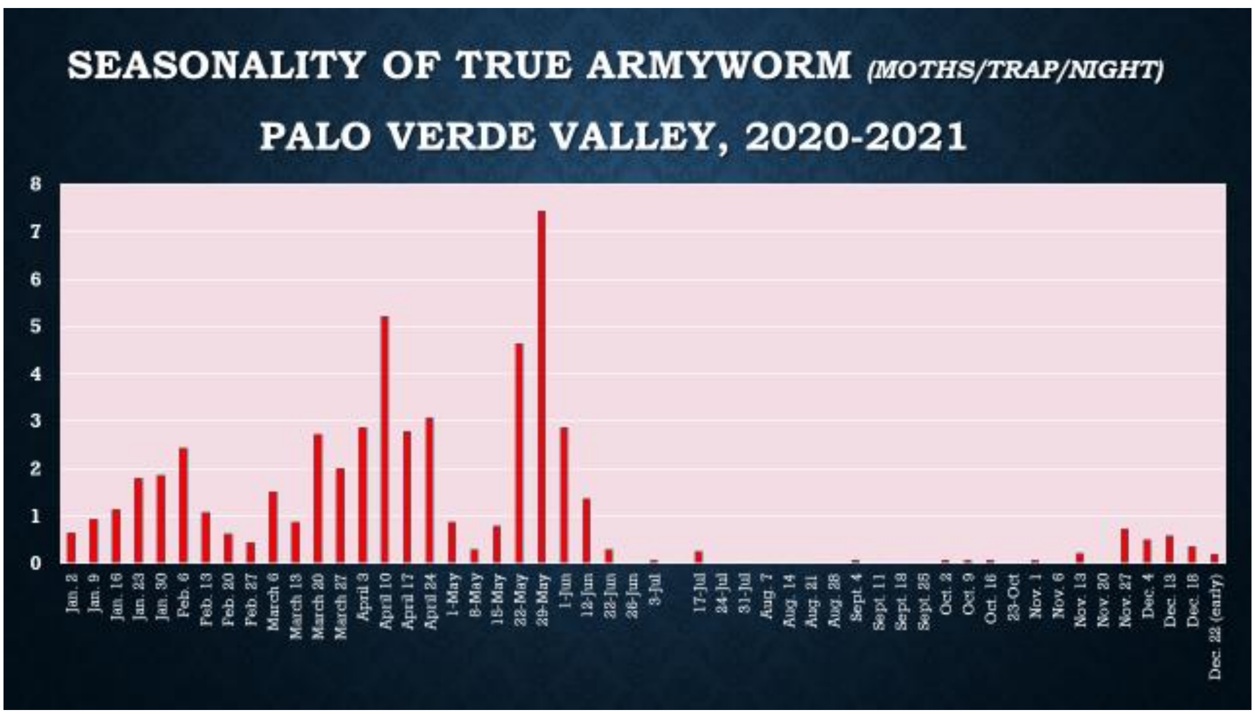
For more information, please contact Ali Montazar (amontazar@ucanr.edu) or Michael Rethwisch (mdrethwisch@ucanr.edu)

## TRUE ARMYWORM SEASONALITY IN THE LOW DESERT

***Michael D. Rethwisch, Crop Production & Entomology Advisor, UCCE Riverside County – Palo Verde Office***

Caterpillars of the true armyworm (*Mythimna unipuncta*) are pests of grass crops across the United States. In the Central Valley of California they are mid-summer pests of crops such as rice, where it can be a significant pest. The low desert area also has multiple grass crops (bermudagrass, teff, sudangrass, wheat, etc.) that could be affected by this insect. The true armyworm is also known to be an occasional pest of cool season grasses in Great Plains states.

As little data are readily available in the low desert, trapping data were collected weekly over the past two (2) years using pheromone based bucket traps to document the seasonality of the true armyworm for this area. Data collected from this trapping indicate that there were three (3) peaks and/or two (2) generations from late January/early February to late May.




Scouting for and finding true armyworm eggs and caterpillars can be challenging. Adult moths (Fig. 1) are fairly easy to identify, with one white dot (hence the name *unipuncta*) near the middle of each buff colored fore wing, and usually a darker linear area that surrounds the white dot and an angular line of dark scales that reach the fore wing tip (Fig. 1). Wingspan is about 1.5 inches. Eggs (Fig. 2) are reportedly laid in linear masses with the leaf tied around the eggs.

Armyworm caterpillars are often difficult to find, as they generally feed at night and hide in the soil during the day, thus their feeding damage is often more evident than the caterpillars themselves (Fig. 3). After hatching, caterpillars first feed on leaf edges, leaving a notched appearance Fig. 4), which then becomes more obvious as leaf ends are missing (Fig. 5),


**Fig. 1. Adult armyworm moth** **Fig. 2 Armyworm egg mass**

**Fig. 3. Armyworm caterpillar, with multiple colored lines and black spiracles.**

**Figs. 4-5. Initial feeding appears as notched leaf edges (left), with later damage resulting in missing leaf tips (right)**

As armyworm caterpillars grow, their feeding damage increases. Entire leaves can be devoured, leaving the plants with some or all missing leaves on some smaller stemmed grassy crop species (Fig. 6). In severe infestations the armyworm caterpillars will even begin feeding on the stems from the tops of plants, resulting in much shorter stems (Fig. 7).

**Figs. 6-7. Grass stems almost devoid of leaves from armyworm caterpillar feeding (left); grass stems showing height differences due to armyworm feeding on stems on far right (right).**

After feeding for 3-4 weeks, the caterpillars pupate (Fig. 8) in the upper soil surface, and both pupae and large armyworm caterpillars are often found together.

**Fig. 8. Armyworm caterpillar and pupae. Caterpillars are usually found in a curled "C" when in the soil, with colored linear markings very easy to see.**

Armyworms are not usually considered to be a significant pest in the low desert. One reason for this may be the flood irrigation practices used in most fields, with this practice thought to drown many of the larvae and pupae in/at the soil line.

# PROMISES AND PITFALLS OF SUBSURFACE DRIP IRRIGATION IN THE DESERT PROCESSED ONIONS

***Ali Montazar, Irrigation and Water Management Advisor, UCCE Imperial, Riverside, and San Diego Counties***

**Introduction.** Climate-Smart Agriculture (CSA) is a catchy term that seems to imply farming smarter in an era of climate change targeting increased productivity, enhanced resiliency, and reduced emissions. More efficient water usage through drip and subsurface drip irrigation (SDI) systems, supplemental and precision irrigation strategies and on-farm water conservation practices are considered as effective CSA tools to improve resource-use efficiency. In this study, a viability assessment was conducted on utilizing SDI in the desert processed onions production system.

Processed onions are produced throughout California with main production areas of Imperial, Kern, Fresno, Siskiyou, and Modoc Counties. There are about 8,800 acres of processed onion production in Imperial County (2020 Imperial County Agricultural Crop & Livestock Report).

**Field trials.** The experiment was carried out in six commercial fields in the Imperial Valley over two crop seasons (2019-2020 and 2020-2021). Out of the six fields, two fields were drip irrigated, two were under sprinkler and the final two under furrow irrigation. The drip irrigated fields were established using drip while the other four fields were germinated using sprinklers. All fields were on a 40-inch bed, six plant rows per bed with a spacing of 2.5-inch between

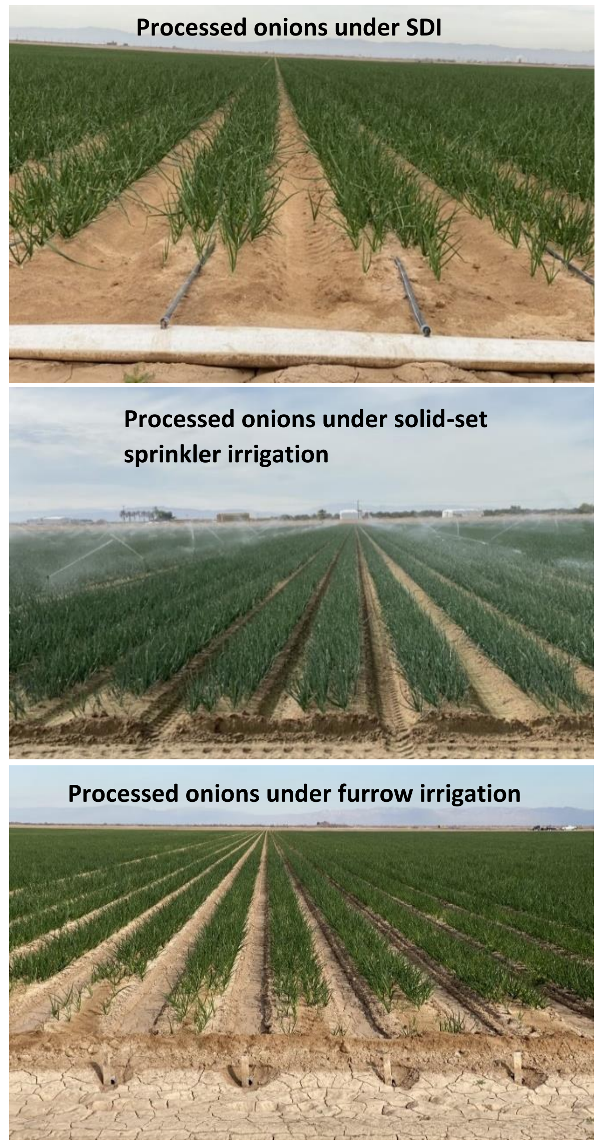



Fig. 1. Furrow irrigation dominates irrigation systems in the desert processed onions. Sprinkler and drip ranked second and third, respectively. It is estimated that nearly 3% of processed onions are currently under drip irrigation in the region.

planting lines. The driplines were installed in the center of beds at an average depth of 1.5-inch.

**Consumptive water use**. The actual crop water use (actual crop evapotranspiration or actual ET) was measured using the residual of energy balance method with a combination of surface renewal and eddy covariance equipment. Variable water consumptive was observed over the crop seasons ranging from 0.02 in/day (December 7, 2020) to 0.25 in/day (April 8, 2021) at the drip irrigated field in the 2020-2021 season. The seasonal water consumptive was 27.4 inches at this field with a long crop season of 237- day, planting on October 23, 2020. The cumulative onion crop water use of the drip irrigated field was 26.2 inches in the 2019-2020 season with a shorter crop season of 212-day planting on November 8, 2019. This amount was roughly 9% more at the sprinkler irrigated fields than the drip irrigated fields. The results indicate that the seasonal crop water use may vary due to irrigation management and farming practices, soil type and conditions, and the length of crop season.

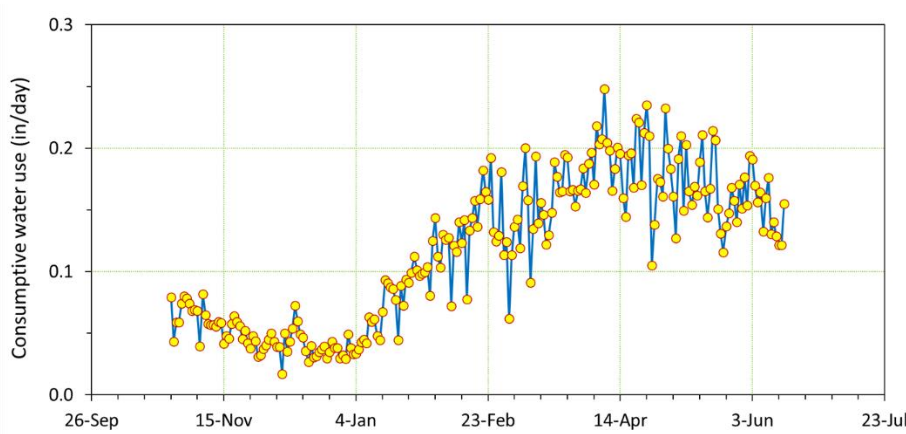



Fig. 2. Actual daily processed onion ET at the drip irrigated field in the 2020-2021 season. Predominate soil texture is silty clay at this field.

**More soil moisture uniformity over time and space at the SDI fields**. Onions require frequent irrigation throughout the crop season since the plant root system is shallow and very little water is extracted from soil depth of more than 2 feet. Most of the crop water needed is extracted from the topsoil (12-in). In addition, onion roots are mostly non- adventitious (branching), and all roots originate at the stem or basal plate of the plant. Keeping the upper soil areas moist is required to stimulate healthy onion root growth. Onions have low capacity for reducing their leaf water potential by osmotic adjustment to compensate less water availability at the root, whether caused by dry soil or salinity issues. The amount and frequency of irrigation water depends on the irrigation practice, soil type and conditions, and temperature. For optimal plant growth, it is recommended to irrigate onion fields when 25% of the available water in the top 2 feet of soil is depleted. The key advantage of SDI system is to apply irrigation water more frequently and uniformly across onion fields over the season. Since irrigation events can be scheduled more frequently, soil moisture may be maintained at a desired level, and consequently the deep percolation is minimized the entire irrigation season (Fig. 3).

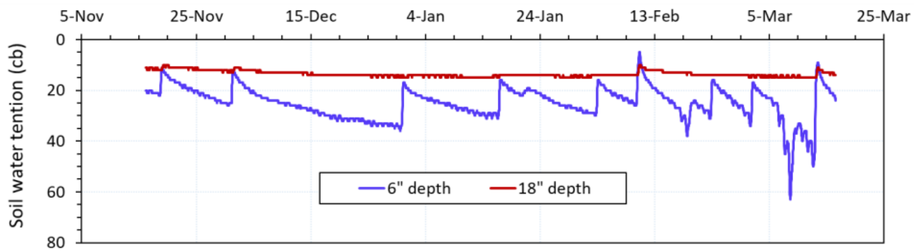



Fig. 3. Soil water tension at the drip irrigated field over the season 2020-2021. The data is reported for the depths of 6 and 18-in.

**Considerable water conserved at the SDI fields.** Using solid-set sprinkler systems for the processed onion stand establishment is a common practice in the low desert; however the drip irrigated fields in this study were germinated using drip. Meaningful differences were observed between the seasonal applied water of the furrow irrigated field and both the drip and sprinkler irirgated fields (Fig. 4). Even though the length of the crop season was different in these fields, it appears that the amount of water applied during a 178-day period after the first irrigation (the furrow irrigated field was harvested 178 days after first irrigation) would be a good meaure to compare water applied at these fields. All three fields were planted between October 13 and October 22, 2020. The applied water during the 178-day period was 4.9, 2.8, and 2.7 ac-ft/ac for the furrow, sprinkler, and drip irrigated fields, respectively. During this period, 2.2 ac-ft/ac water was conserved at the drip irrigated field compared to the furrow irrigated field. The seasonal applied water was 3.3 and 3.5 ac-ft/ac at the drip and sprinkler irrigated fields.

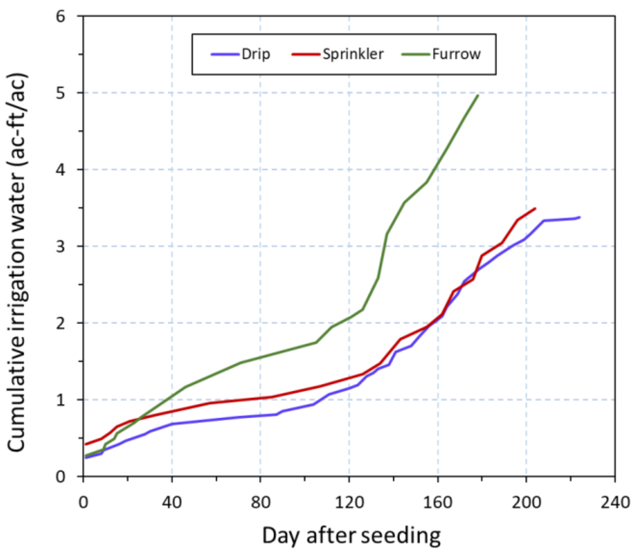



Fig. 4. Cumulative applied water (irrigation + rainfall) over the 2020-2021 crop season at the experimental sites. The crop season was 178, 204, and 224 days for the furrow, sprinkler, and drip irrigated fields, respectively.

**Less costs for downy mildew management at the SDI fields.** Downy mildew has complex environmental requirements, needing both cool temperatures and high humidity. Downy mildew spores are airborne and after landing on healthy plants, they require leaf wetness for infection to occur. Minimizing canopy leaf wetness could reduce the incidence and severity of downy mildew in onions. Lower disease pressure is generally expected in drip irrigated fields due to less leaf wetness potential. Growers apply different amount and type of fungicides to control downy mildew depending on severity of disease in onion fields.

While the total cost of fungicides applied per acre by growers is not a scientific measure to evaluate the impact of irrigation practices have on downy mildew incidence, this indicator could be considred as an applied evaluation measure from grower prespective. Growers generally apply more fungicides if the severity or the risk of disease is greater. The data provided by the cooperative growers in the 2020-2021 season demonstrated that the total cost of fungicides applied per acre for the drip irrigated field was 96.2% less than the sprinkler irrigated field and 54.6% less than the furrow irrigated fields. The fields were nearly 2 miles away from each other and it is assumed similar weather conditions.

**Greater nitrogen-use efficiency at the SDI fields.** The total nitrogen accumulated in onion bulbs was determinded at the experimental fields and the total nitrogen applied quantities were monitored over the crop seasons. The nitrogen-use effiency measure was computed for each of the experimental fields as the ratio of nitrogen accumulated in onion bulbs to nitrogen units applied. The value of this measure for each field is shown in Fig. 5. The results demonstrated that the mean N-use efficiency was greater at the drip irrigated field (74.1%) than both sprinkler (68.7%) and furrow (45.7%) irrigated fields.

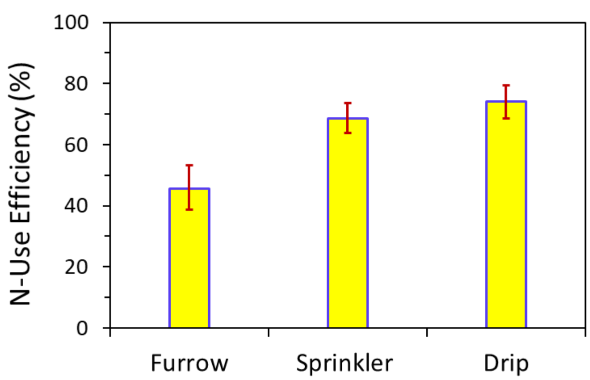



Fig. 5. Mean N-use efficiency at the of the experimental fields over the 2020-2021 season. Standard deviation of the corresponding N-use efficiency values is shown on the bars.

**Higher potential yield at the SDI fields.** Different factors may affect the yields of processed onion fields such as water and nutrient managemant practices, soil types and conditions, plant population  and uniformity, the length of crop season, and pest pressure and management. Therefore, a more comprehensive data set and analysis is required to assess the impact of irrigation methods on the processed onion production in commercial fields. The observations of this study illustrated that the average weight of onion bulbs per acre (at harvest) at the drip irrigated field was nearly 21% and 4% greater than the furrow and sprinkler irrigated fields, respectively.

**More salt accumulation on the topsoil at the SDI fields**. Salinity may decrease bulb diameter, bulb weight, root growth, plant height, and number of leaves per plant in onions. Salinity often affects the timing of development and flowering in onions occurs earlier under salt stress. A salinity survey was conducted at each of the experimental sites which demonstrated salt accumulation on the topsoil at the drip irrigated fields (Fig. 6). The survey showed that soil electrical conductivity (ECe) varied from 3.6 to 10.6 dS/m at the depth of 0-6 inches. The average ECe values at the same depth were lower at the furrow and sprinkler irrigated fields.

Buildup of soil saline conditions could occur on the topsoil in drip irrigated processed onion fields. To maintain salinity over the season, applying sufficient irrigation water at high enough frequencies to guarantee adequate leaching in the effective crop root zone is required. The salinty survey conducted after the summer leaching practice undertaken at this drip irrigatd field indicated that the entire soil profile was effectively leached and the high ECe values of the topsoil declined to an average of 1.8 dS/m in late September 2021. It is concluded that the current salt leaching practices in the region along with an effective drainage system can remove salt from the crop root zone and sustain soil producivity. Effective irrigation managmant of drip irrigated fields may also maintain potential saline conditions of the topsoil over the season.

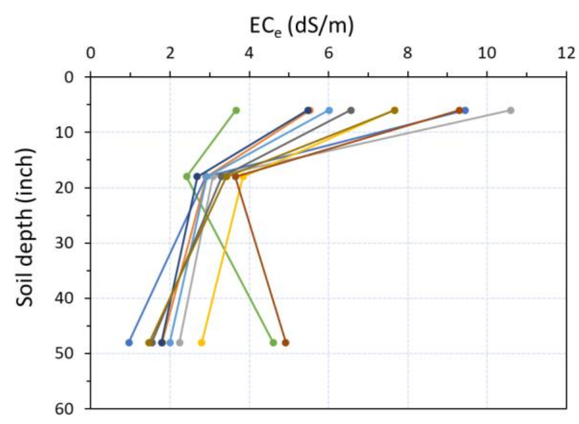



Fig. 6. ECe values at the soil profile in 10 different locations at the drip irrigated field two weeks after harvest (June 26th, 2021).

**Acknowledgments.** Funding for this study was provided by California Garlic and Onion Research Advisory Board and the Imperial County Agricultural Benefits Program. The author gratefully acknowledges the farms that contributed to this effort with sincere collaboration during the study, and for allowing the research staff to implement the project in their agricultural operations.

## CURRENT INSECT PEST STATUS ON IMPERIAL VALLEY ALFALFA

***Apurba Barman, Area Low Desert IPM Advisor, UCCE Imperial County***

During the latter half of winter, aphids and alfalfa weevils are the primary pests infesting the low desert alfalfa crops. Alfalfa aphids started showing up since early December and numbers are continuing to increase. Similarly, alfalfa weevil numbers are also increasing from levels noted in January.

There are four aphid species commonly observed in alfalfa: cowpea aphids, spotted alfalfa aphids, pea aphids and blue alfalfa aphids. Cowpea aphids are quite common and black in color, found in clusters near the top of the stem. Pea aphids and blue alfalfa aphids are green and proportionately larger than the cowpea aphids. Spotted alfalfa aphids are the smallest of these aphids, and as the name implies, appear spotted, being somewhat yellow in overall color. Spotted alfalfa aphids are usually found feeding on the undersides of alfalfa leaves.

Blue alfalfa aphids can be separated from pea aphids by closely looking at their antennae. The antennae of pea aphids have several narrow dark bands on their antennal segments, whereas antennae of blue alfalfa aphids do not have bands but gradually darken from light colored at the base to darker brown near the tip of the antennae. During scouting of alfalfa fields for aphids, identification and estimates of each aphid species is important as the damage potential and management can vary.

Among the four aphid species mentioned above, three inject a toxin into alfalfa plants, with the exception being the pea aphid. Blue alfalfa aphids are more damaging than other smaller aphids, although all three species which inject toxins reduce the plant vigor and yield.

Fortunately, natural enemy numbers are also increasing, and presence of different ladybeetle species, lacewing larvae, damsel bugs, big eyed bugs and spiders indicate that there is some level of biological control in action against the aphids and alfalfa weevils. Selection of insecticides to treat either aphids or alfalfa weevils should consider the level of beneficial insects present and the impact on natural enemy populations. Insecticide products such as Transform, Sivanto, and Beleaf are efficacious on aphids but easy on natural enemies. (Note: Transform is not currently registered for usage on California alfalfa, and Beleaf currently has a 60 days pre-harvest interval). While pyrethroids and organophosphates may also do the job, they are quite harmful to natural enemies and can disrupt the biological control of aphids and other pests.

In addition to the current seasonal concern with blue alfalfa aphids, alfalfa weevils should not be forgotten. Larvae of alfalfa weevils feed voraciously on the leaf tissues causing many holes and, in some cases, only the veins of the leaves remain. The treatment decisions for alfalfa weevil may vary with the stage of the crop. If the crop is not near cutting, using an effective insecticide is recommended.

It is also important to remember that the alfalfa weevil populations in different parts of California, such as the Palo Verde Valley, were found to exhibit tolerance to pyrethroid insecticides. Michael Rethwisch has extensively screened number of insecticide products for alfalfa weevil populations in Blythe area. I am attaching his trial results for your perusal (last page of this article). It appears that the Steward has satisfactory control compared to other products. However, if more than one application is needed to keep the weevil populations down, other combinations should be considered to avoid development of insecticide resistance.

I have also found out after sampling a number of fields in the area that the alfalfa leaftier has survived the winter. The good news is that only a few fields had very low number of either larvae or pupae present. If you are scouting alfalfa fields, you may sometime encounter both alfalfa leaftier and alfalfa weevil larvae. Small alfalfa larvae sometimes can be mistaken with alfalfa leaftier larvae. The white, long band on the back and small back head of alfalfa weevil larvae are should be easy to separate from the leaftier larvae (Fig. 1), which do not have any bands and have a larger back area on the front (both head and prothorax are back).

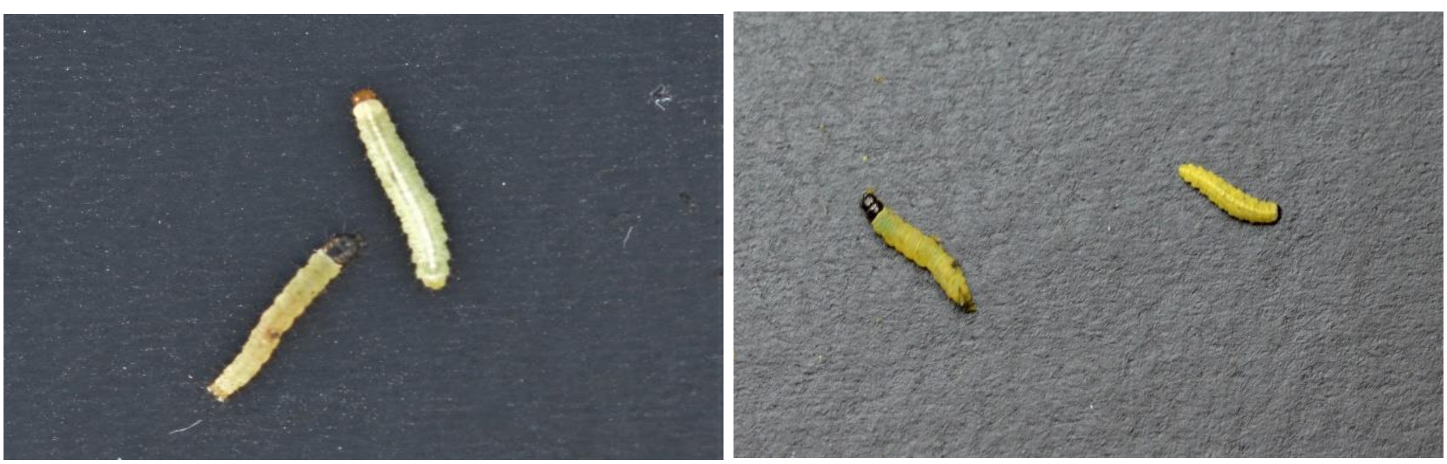


Fig. 1. Notice the difference between the alfalfa leaftier (left in both photos) and alfalfa weevil larvae (right in both photos)

The feeding damage symptoms should also help to discern if it is caused by alfalfa weevil larvae or leaftier larvae. Feeding by alfalfa weevils cause holes on the leaves, while leaftier larvae cause webbing and folding of leaves and whitish coloration due to scrapping of leaf tissues (Fig. 2). Alfalfa leaftier is not expected to be at pest levels at this time of the year, but it is better to be aware of this pest due to its unknown activities.

Fig. 2. Notice the damage from alfalfa leaftier (left) and alfalfa weevil (right) larvae

# Alfalfa Weevil Insecticide Efficacy Grades - 2022

Michael D. Rethwisch, Crop Production and Entomology Farm Advisor, UCCE-Riverside County,
Palo Verde Valley Office, 290 N. Broadway, Blythe, CA, 92225-1649 760-921-5064 mdrethwisch@ucanr.edu

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This Grade Chart represents the average Insecticide Efficacy Grade against alfalfa weevil larvae from experiments conducted in the Palo Verde Valley over the past four years, with applications being approximately 18 gallons/acre to ensure excellent foliage coverage.

Some products and rates are represented by only a single data point, while others have multiple year/rates of data. Data shown are from experiments which had weevil larvae numbers at or above economic threshold levels, thus providing high confidence in data

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| Grade relationship to percent control | | |
|---|---|---|
| A+ = 97-100 | A = 94-97 | A- = 90-94 |
| B+ = 87-89.9 | B = 84-87 | B- = 80-84 |
| C+ = 77-79.9 | C = 74-77 | C- = 70-74 |
| D+ = 67-69.9 | D = 64-67 | D- = 60-64 |
| F+ = 57-59.9 | F = 54-57 | F- = 50-54 |
| <F = less than 50% reduction compared to untreated check | | |

| Insecticide and oz. /acre | | 3-4 days post treatment | 6-8 Days post treatment | 9-10 days post treatment | 13-14 days post treatment |
|---|---|---|---|---|---|
| Besiege | 5.0 | D- | D | F | F |
| Besiege | 10.0 | C- | D+ | F- | F+ |
| Beta-cyfluthrin | 2.8 | F+ | | C- | D |
| Dimethoate | 8.0 | <F | <F | | <F |
| Dimethoate | 16.0 | D- | <F | | F |
| Malathion 8 | 12.0 | D- | F+ | | <F |
| Prevathon | 14.0 | D | D- | <F | F |
| Prevathon | 20.0 | F+ | C- | D- | D- |
| Sevin XLR Plus | 32.0 | <F | <F | | <F |
| Sevin XLR Plus | 48.0 | <F | <F | | <F |
| Steward | 4.0 | B- | | A | A |
| Steward | 6.0 | B | | A | A+ |
| Steward | 6.7 | A- | A | A+ | A |
| Vantacor | 1.25 | D- | <F | <F | F+ |
| Vantacor | 2.5 | D | D | D- | D |
| Warrior II | 1.28 | D+ | F- | | D- |
| Warrior II | 1.92 | F+ | F | F+ | D |
| Dimethoate + Sevin XLR Plus | 8.0 / 32.0 | D+ | <F | | <F |
| Dimethoate + Sevin XLR Plus | 16.0 / 48.0 | D | D- | | F+ |
| Sevin XLR Plus + Warrior II | 32.0 / 1.28 | B- | D+ | | B |
| Sevin XLR Plus + Warrior II | 48.0 / 1.92 | B- | B | | A |

# Samples wanted for research on
# **Lettuce Fusarium wilt**

| | |
|---|---|
| **WHAT we are looking for** | Samples of lettuce plants affected by Fusarium wilt |
| **WHERE we are looking** | Imperial County (including Bard/ Winterhaven area) and Huron, other regions of California also welcome |
| **WHY we are doing this** | To monitor for emergence of new pathogen races |
| **HOW you can help** | If you are a grower or PCA and you have Fusarium wilt in your lettuce crop, contact us and we will survey your field and collect samples |


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Stephanie Slinski, Yuma Center for Excellence in Desert Agriculture

Funded By:
California Leafy Greens Research Program
2021-2022

## IMPERIAL VALLEY CIMIS REPORT AND UC WATER MANAGEMENT RESOURCES

*Ali Montazar, Irrigation and Water Management Advisor, UCCE Imperial and Riverside Counties*

The reference evapotranspiration ($ET_o$) is derived from a well-watered grass field and may be obtained from the nearest CIMIS (California Irrigation Management Information System) station. CIMIS is a program unit in the Water Use and Efficiency Branch, California Department of Water Resources that manages a network of over 145 automated weather stations in California. The network was designed to assist irrigators in managing their water resources more efficiently. CIMIS ET data are a good guideline for planning irrigations as bottom line, while crop ET may be estimated by multiplying $ET_o$ by a crop coefficient ($K_c$) which is specific for each crop.

There are three CIMIS stations in Imperial County include Calipatria (CIMIS #41), Seeley (CIMIS #68), and Meloland (CIMIS #87). Data from the CIMIS network are available at: http://www.cimis.water.ca.gov/. Estimates of the average daily $ET_o$ for the period of February 1st to April 30th for the Imperial Valley stations are presented in Table 1. These values were calculated using the long-term data of each station.

Table 1. Estimates of average daily potential evapotranspiration ($ET_o$) in inch per day

| Station | February | | March | | April | |
|---|---|---|---|---|---|---|
| | 1-15 | 16-28 | 1-15 | 16-31 | 1-15 | 16-30 |
| Calipatria | 0.12 | 0.13 | 0.16 | 0.19 | 0.22 | 0.25 |
| El Centro (Seeley) | 0.13 | 0.15 | 0.19 | 0.22 | 0.24 | 0.28 |
| Holtville (Meloland) | 0.12 | 0.14 | 0.17 | 0.21 | 0.23 | 0.27 |

For more information about ET and crop coefficients, feel free to contact the UC Imperial County Cooperative Extension office (442-265-7700). You can also find the latest research-based advice and California water & drought management information/resources through link below:

http://ciwr.ucanr.edu/.

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