


Imperial County *Agricultural Briefs*

University of California Agriculture and Natural Resources

Features from your Advisors

May 2021 (Volume 24 Issue 5)

Table of Contents

APRIL 2021 CATTLECAL NEWSLETTER UPDATE

Brooke Latack, Livestock Advisor – Imperial, Riverside, and San Bernardino Counties

This month the CattleCal Newsletter covered information on urea supplementation in cattle diets and an update on our current research at the UC DREC feedlot. We also include transcripts from our podcast episodes featuring Dr. Fernanda Ferreira. If you would like to subscribe to the CattleCal newsletter, please visit this site and enter your email address: http://ceimperial.ucanr.edu/news_359/CattleCal_483/

The CattleCal podcast released four episodes in April.

- **Week 1: CareerCal**

  In this episode we spoke to Dr. Fernanda Ferreira. Dr. Ferreira is an Assistant Specialist in Cooperative Extension in Population Health & Reproduction at the School of Veterinary Medicine at UC Davis. Fernanda shared her amazing story on how she arrived at the job that she has today, an awesome story of life and professionalism that has crossed through different industries and is definitely contributing to the cattle world.

- **Week 2: ResearchCal**

  In this episode, we called Dr. Fernanda Ferreira again to learn more about the research she is conducting. We learned more about her work with using beef semen on dairy animals and what that means for the beef industry.

- **Week 3: FeedlotCal**

  In this episode, join Pedro Carvalho and Brooke Latack as they discuss a study looking at urea supplementation in beef cattle and it's impact on performance.

- **Week 4: Quiz Zinn**

  This week we ask Dr. Richard Zinn about urea supplementation in cattle diets and the use of feed additives to improve cattle performance.

The podcast can be found at https://open.spotify.com/show/6PR02gPnmTSHEgsv09ghjY?si=9uxSj3dYQueTEOr3ExTyjw or by searching "CattleCal podcast" in Spotify. It is free to listen!

If you have burning questions about cattle management and would like your questions featured on our Quiz Zinn episodes, please send questions to cattlecalucd@gmail.com or DM your question to our Instagram account @cattlecal.

If you have any questions or comments or would like to subscribe to the newsletter, please contact:

Brooke Latack (UCCE Livestock advisor) – bclatack@ucanr.edu
Pedro Carvalho (CE Feedlot Management Specialist) - pcarvalho@ucdavis.edu
CattleCal: cattlecalucd@gmail.com

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Agriculture and Natural Resources

Invitation to participate in a survey to assess the Impact of COVID-19 on Imperial County agricultural crop and livestock production.

UCCE Imperial County is conducting a survey to assess the impact of COVID-19 on Imperial County agricultural crop and livestock production. We would like to hear from any crop or livestock producers of any size that farm in Imperial County, California. The questions will cover topics related to the impact of COVID-19 on your farm including economic and logistic disruptions, changes in farm management practices, and COVID issue mitigation methods. The survey will take no more than 10 minutes.

Your participation is voluntary. Your participation in this research will remain completely anonymous. No identifying information will be collected at any point. You may refuse to answer questions that you do not want to answer and still remain in the study. You can stop the survey at any time. There are no costs to you for participating.

We appreciate any participation and will share results through future newsletters and publications.

Click here to access the survey: https://ucanr.co1.qualtrics.com/jfe/form/SV_6AnJYxnWfHyZt8a

If you have any further questions about this research, you may contact University of California - Imperial

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FIELD-SCALE CROP WATER NEEDS AND CROP COEFFICIENTS VARIABILITIES IN THE DESERT ALFALFA PRODUCTION SYSTEM

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

Introduction. Alfalfa accounts for about 28% of California's low desert crops (nearly 200,000-acre alfalfa hay) and is the dominant water user due to its high acreage and long growing season. While more than 95% of low desert alfalfa is currently irrigated by surface irrigation systems, various irrigation strategies and on-farm water conservation practices were adopted by local growers to enhance the efficiency of crop water-use. Some of the most impactful tools and practices for efficient crop water use are utilizing advanced water system delivery technologies of subsurface drip irrigation (SDI), overhead linear move irrigation, and automated surface irrigation, and implementing management strategies of tailwater recovery system, moderate summer deficit irrigation, and proper irrigation scheduling.

Regardless of the type of irrigation system, accurate estimates of alfalfa crop water needs are essential for proper management of irrigation water, and to maximize the net benefits of alfalfa hay production. This study aimed at developing crop water use information and crop coefficients under various irrigation management practices for the low desert alfalfa.

Field experiments. The experiments were carried out in ten commercial fields in the Palo Verde and Imperial Valleys in a wide range of soil types and irrigation practices over a 27-month period (January 2019 through March 2021). The experimental fields consist of two fields under conventional check flood irrigation (flat), two fields under conventional furrow irrigation, three SDI fields, two fields under linear move overhead sprinkler, and one field under automated surface irrigation system (Table 1).

Table 1. General information of the alfalfa experimental sites (field A through field J).

Field	Dominate soil type	Irrigation practice
A	Loam	Surface (furrow)
B	Loam	Surface (furrow)
C	Clay	Surface (flat)
D	Sandy loam	Surface (flat)
E	Silty clay loam	SDI
F	Sandy loam	SDI
G	Silty clay loam	Automated surface irrigation (flat)
H	Silty clay	SDI
I	Silty clay	Linear move sprinkler
J	Silty loam	Linear move sprinkler

The actual crop water consumption (actual crop ET or ET_a; ET stands for crop evapotranspiration) was measured using the residual of the energy balance method with a combination of surface renewal and eddy covariance equipment (fully automated ET tower shown in Fig. 1). As an affordable tool to estimate actual crop ET, Tule Technology sensors were also set up at all experimental sites in addition to the four fully automated ET towers. The Tule ET data were verified using the ET estimates from the fully automated ET station. Soil moisture sensors were installed at multiple depths to monitor soil water potential on a continuous basis.

Using the daily ET_a determined in each experimental site and the daily reference ET (ET_o) retrieved from the spatial CIMIS (California Irrigation Management Information System) data for the coordinates of the monitoring station, the daily actual crop coefficient K_a was calculated as $K_a = ET_a/ET_o$.

Fig. 1. A fully automated surface renewal and eddy covariance evapotranspiration tower at site B (left) and a multi depths soil moisture sensor monitoring station equipped along with Tule and NDVI sensors at site A (right).

Results. Variable daily alfalfa crop water consumption (actual ET) was observed over the study period in each of the experimental fields. The amounts of water consumptions could be mostly affected by harvest schedule and day of year (Fig. 2). The daily alfalfa water use varied widely in each field over time, for instance at site A, from 0.09-in after cutting on March 27th, 2019 to 0.41-in at full crop canopy on July 17th, 2019 (Fig. 2). An average daily crop water consumption of 0.17-in and 0.16-in was observed at this site during the 2019 season and the 2020 season, respectively.

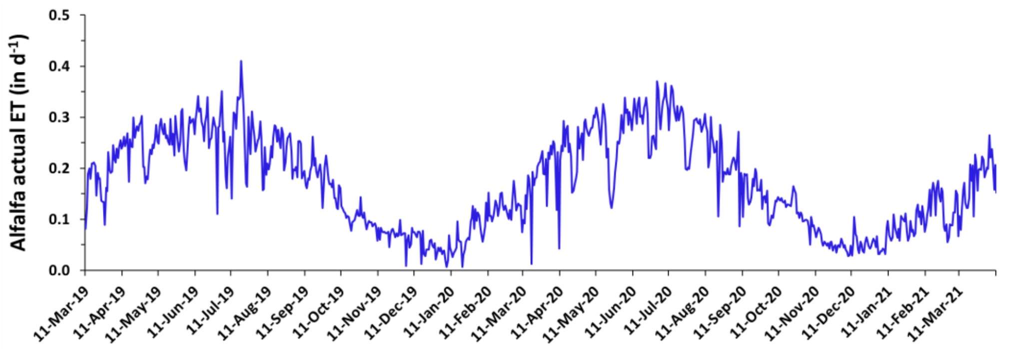

Fig. 2. Daily actual evapotranspiration using eddy covariance method.

The number of harvests per year was 8 to 9 at the experimental sites over the study period. Because of frequent harvesting events, alfalfa crop coefficient (K_a) value oscillates over the harvest cycles (Fig. 3). The crop coefficient value depends on the alfalfa growth stages, ranging from smallest during initial growth stage, just after each harvest, and reaching the maximum at full crop canopy development stages, prior to each harvest. Alfalfa K_a ranged from about 0.5 after hay cut to nearly 1.24 at full canopy over each harvest period. Since alfalfa has seasonality values of crop coefficients, these minimum and maximum values, and the average value of harvest cycles may vary over the seasons.

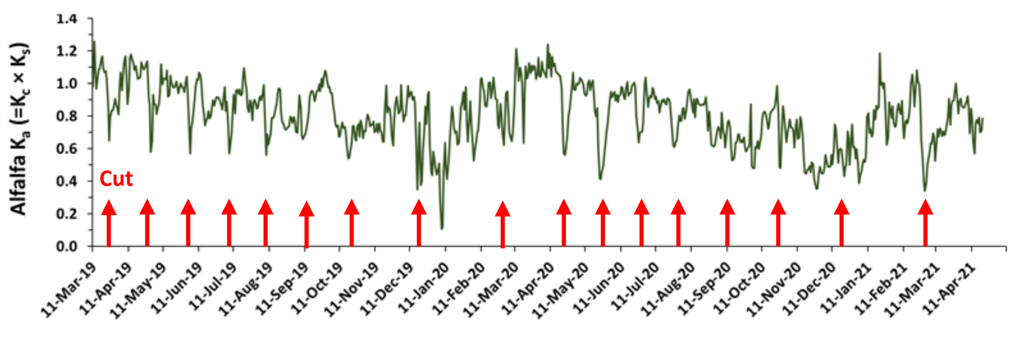

Fig. 3. Actual crop coefficient value (Ka) at site A over the study period. The daily stress coefficient (K_s) represents water and salt stresses, management, and environment multipliers. To obtain ET_a, K_s is needed to adjust crop coefficient (K_c)

Lower crop coefficient values were determined at the early and late season harvest cycles and higher values in mid-season harvest cycles (Fig. 4). In this study, the highest alfalfa crop coefficient values were observed during the harvest cycles of April through June. An average of 0.82 for the March harvest cycle, 0.95 for the harvest cycles of April-May, 0.89 for the harvest cycles of Jun-July, 0.84 for the harvest cycles August-September, and 0.75 for the fall harvest cycles. These crop coefficient values reflect local cultivation conditions in terms of climate, soil, and water and crop management.

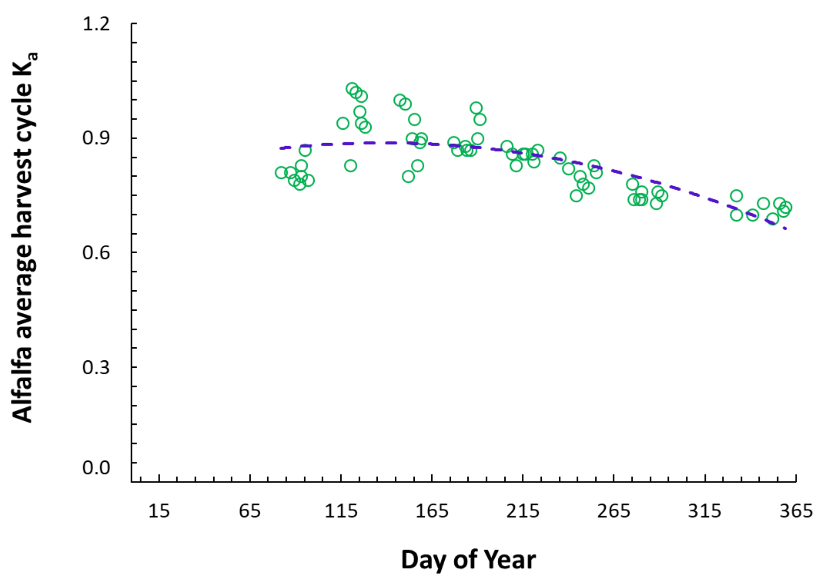

Fig. 4. Alfalfa average harvest cycle crop coefficients. The K_a values of the 2019 and 2020 seasons at sites A, B, C, and D were used for this analysis.

Alfalfa seasonal crop water use may be affected considerably by irrigation type, other management practices, and soil types and conditions. The seasonal crop water consumption varied from 56.3-in at site G to 62.8-in at site A in 2019 and from 57.1-in at site E to 60.6-in at site J in 2020 (Fig. 5). An average seasonal crop water use of 59.4-in was determined for alfalfa in the low desert production system.

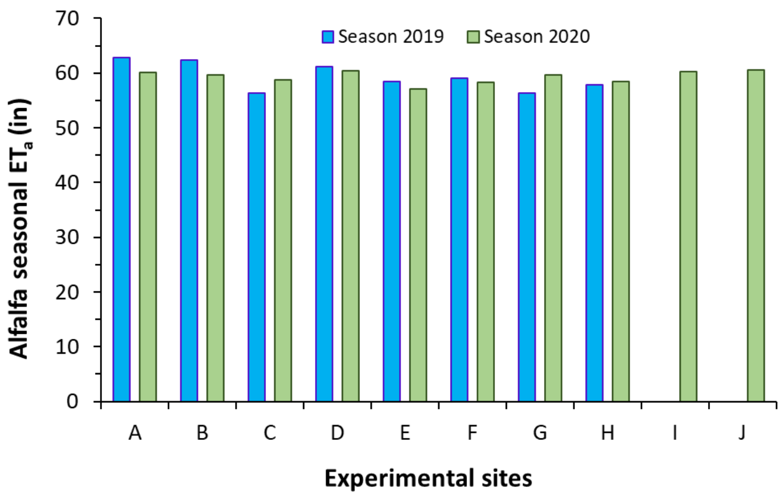

Fig. 5. Alfalfa seasonal water use at the experimental sites over the 2019 and the 2020 seasons. The crop water consumptions were measured by surface renewal method. The measurements were not conducted for field I and J during the 2019 season.

Observation of higher crop water consumption at fields under SDI is expected due to better water distribution uniformity over time and space. The findings from this study clearly reveal that this expectation could be true or not, depending upon how properly irrigation water is managed. The soil moisture and applied water data verify that fields C, G, and H in 2019 and fields E, F, and H in 2020 could occasionally experience moderate water stress, although growers had no plan for deficit irrigation at these sites and kept the fields under regular growers' practice. Alfalfa dry matter yield at these specific sites was 6.6-7.5% less than the average dry matter yield achieved at whole experimental sites during similar crop season. The average dry matter yield was 10.9 and 10.3 t/ac at the experimental fields in the 2019 and 2020 seasons, respectively.

The practice of filling the soil profile so that it holds as much water as possible would be an effective early season alfalfa irrigation strategy. Such practice may allow alfalfa to take full advantage of available water and promote its rapid, early- to mid-season growth period and when the yield potential is highest (approximately 73–75% of total alfalfa seasonal yield productivity at the experimental sites occurred by mid-July), and when soil and air temperatures are not likely to be high enough to stress the crop and limit crop productivity. Such strategy was not properly followed at site C in 2019, could be part of the reasons for lower seasonal crop water use and subsequent lower dry matter yield.

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Weed Management for Small Acreages

Join UC Cooperative Extension for a *FREE* online workshop

Tuesday, May 25, 2021
6:00 – 7:30 PM

Topics Include:

- Poisonous Plants
- Yellow Starthistle Control
- Herbicide Resistant Weeds
- Weed ID 101

Bonus Weed ID Session!
Submit a picture of a weed and learn the name during the workshop!

Register at: http://ucanr.edu/weed-webinar

Tips for submitting photos:

- Include something that shows scale (ruler, pencil, coin)
- Make sure the photo is clear (not blurry)
- Include the flowering structure and a leaf (2 pictures)
- Include a short description of location and plant characteristics

For more information contact Julie at (661) 868-6219 or jafinzel@ucanr.edu.

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Rangeland Weed Management Workshop

Tuesday, May 25, 2021
6:00 – 7:30 PM

6:00 – 6:05 **Introductions**

6:05 – 6:20 **Common Weeds in Irrigated Pastures**
Julie Finzel, UCCE Kern, Tulare, and Kings Counties
Knowing the name of the weed you are concerned about is the first step! Learn about common weeds in irrigated pastures and review online and phone app weed ID tools.

6:20 – 6:30 **Common Rangeland Weeds**
Rebecca Ozeran, UCCE Fresno and Madera Counties
Common weeds found on rangelands will be discussed along with online resources for reviewing weed control options.

6:30 – 6:45 **Poisonous Plants of California**
Brooke Latack, UCCE Imperial, San Diego, and San Bernardino Counties
Review common poisonous plants found in irrigated pastures, rangelands, and contaminated hay.

6:45 – 7:00 **Integrated Pest Management for Yellow Starthistle**
Devii Rao, UCCE San Benito, Monterey, and Santa Cruz Counties
Learn about effective control methods, including herbicide, mowing, grazing

7:00 – 7:15 **Herbicide Resistant Weeds in Irrigated Pastures**
Theresa Becchetti, UCCE San Joaquin and Stanislaus Counties
Identify common herbicide resistant weeds in irrigated pastures and discuss control options

7:15 – 7:30 **Name that Weed!**
Jose Dias
Submit your photo and learn the name of that problem weed!

MANAGEMENT OF LYGUS BUGS IN LOW DESERT ALFALFA SEED

Apurba Barman, Area IPM Advisor, UC Cooperative Extension-Imperial County

Alfalfa seed is an important crop in Imperial County, which produces nearly 80% of the alfalfa seed in the state. Several insect pests are of major concern and represent a significant share of the overall production expense. Insect pests such as lygus bugs, seed chalcid, stink bugs and occasionally spider mites are common in California alfalfa seed fields. Lygus bugs tend to be the most consistent and troublesome insect pest, with the potential to result significant yield loss.

The western tarnished plant bug (WTPB), *Lygus hesperus*, is native to North America and dominant throughout the western United States. This insect can feed and reproduce on more than 200 different plant species that includes many crops and weed species. Cotton, strawberry, potato and beans are some of the crops that experience economic loss from feeding by lygus bugs in addition to alfalfa seed. Lygus bugs prefer to feed and reproduce on alfalfa in comparison to other crops or weed species. In Imperial County, which experiences mild winter temperature, alfalfa is available throughout the year as food and shelter for lygus bugs.

Adult lygus bugs are about 0.25 inch long and 0.1 inch wide, pale green to brown in color with a prominent triangular shape in the center of the back. There are five immature stages (nymph) of this insect and each stage is similar in terms of their coloration except the size (Fig. 1). Later stages (4^{th} and 5^{th}) of immature lygus bugs can be separated from early stages (1^{st}, 2^{nd} and 3^{rd}) by the presence of wing pads (miniature form of actual

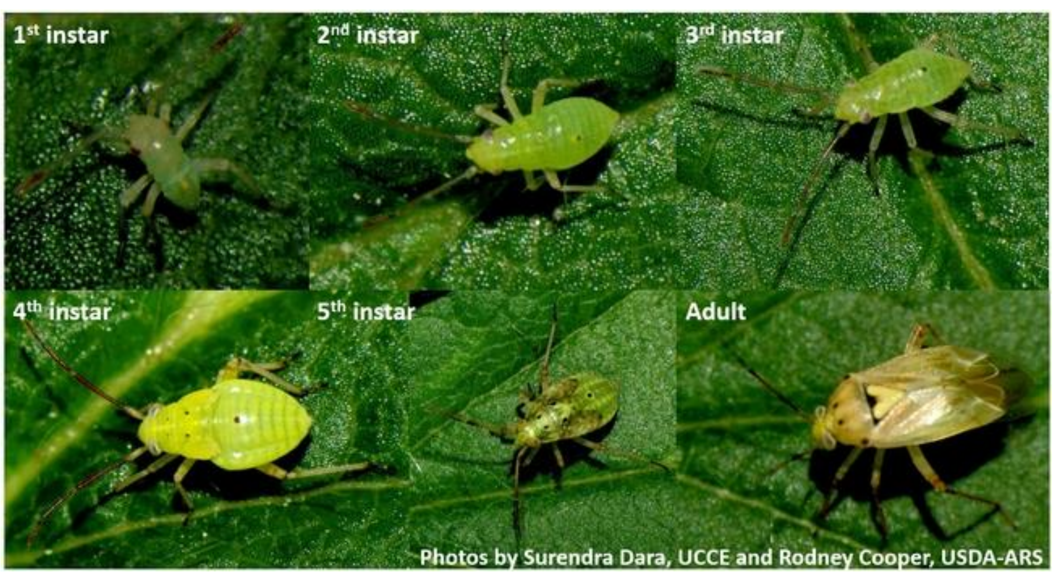

Fig. 1 Adult and immature stages of lygus bug (Source: E-Journal of Entomology and Biologicals, Nov 25, 2015

wings). It is important to be able to distinguish whether lygus bug immatures are at their early or late stage during sampling so that proper timing of insecticide applications can be adjusted to obtain maximum insect control.

Lygus bugs have piercing-sucking mouthparts, a needle like structure that is inserted into plant tissues, which allow them to introduce toxic saliva to the feeding sites and suck out plant juice. Regardless of the crop, lygus bugs prefer to feed on the reproductive parts of a plant such as flowers, buds and developing seeds etc. An alfalfa seed crop provides enormous opportunity for lygus bug to feed as the plants are full of fruiting structures. Both adults and immature stages of lygus bugs can feed on flowers, buds and green pods, which results in premature drop of buds and flowers (stripping), seed deformation, and reduced seed viability. Therefore, it is critical to control of *lygus* bugs for successful and economic production of alfalfa seed.

<u>When to treat for lygus in alfalfa seed?</u> Answer to this question varies depending on the crop growth stage, as the economic loss (economic threshold level, ETL) due to lygus bugs differs. In California, the established threshold for lygus bugs on alfalfa seed crop is: 4-6 per sweep during bud or pre-bee stage of the crop, 8-10 per sweep during bloom to early seed set, and 10-12 per sweep during seed maturity.

Timely and continued scouting of the fields to quantify the population density of lygus bugs is critical for effective control of this pest in alfalfa seed crop. Understanding the biology of lygus bug and ability to identify different immature stages of the insect is going to be helpful in determining the timing of insecticide application and getting the best control.

The time it takes to complete a generation for lygus bugs in summer months depends greatly upon the temperature. Two published studies have investigated western tarnished plant bug development relative to heat units. One study found that full generation from egg to egg required 799 heat units (base of 54°F) and 623 heat units from egg to adult, while the other study noting 767 heat units from egg to adult using a lower temperature threshold of 46.4°F and a high of 104°F.

Unfortunately, one can find all stages of lygus bugs in the field at the same time. Noting their growth stages is important for insecticide efficacy. As lygus bugs develop and especially at later growth stages, the ability of insecticides to control them may be limited. Adults are strong fliers, which makes the insecticide applications less effective in controlling them.

Insecticide choice and application timing is also important since growers rely on commercial honeybee hives in addition to alfalfa leafcutter bees for maximizing seed production. Most of the synthetic insecticides used in alfalfa production system are detrimental to bee health. If insecticide applications become necessary based on the threshold levels, applications should be made during late evening to early morning, when bees are not foraging.

There are not many insecticides available for lygus management in California alfalfa seed. Carzol® SP, Dimethoate 400 EC, Beleaf® 50SG, and Rimon® 0.83EC are registered products for usage on alfalfa seed crop, the latter two (Beleaf and Rimon) being registered with special local need (24c). It is important to remember that both Carzol® SP and Dimethoate 400EC are highly toxic to bees and also to natural enemies.

There have been several studies done in the past to evaluate more insecticides chemistries to fit into a sustainable lygus management program, where one does not have to rely on a single chemistry and have rotational options. Among those new products, Transform® WG appears to be very promising based on the research trials, but is not yet registered for usage on alfalfa seed in California. Michael Rethwisch, Crop and Entomology Farm Advisor at Blythe has already tested several new chemistries and identified additional potential chemistries and combinations for lygus management. In 2021, another research trial will soon be underway at the Desert Research Extension Center at Holtville to evaluate new insecticide chemistries for lygus control and their effect on beneficials and pollinators.

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 May 1st to July 31th 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	May		June		July	
	1-15	16-31	1-15	16-30	1-15	16-31
Calipatria	0.27	0.29	0.31	0.32	0.32	0.31
El Centro (Seeley)	0.29	0.31	0.34	0.36	0.33	0.31
Holtville (Meloland)	0.29	0.31	0.33	0.34	0.32	0.31

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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