

Imperial County

Agricultural Briefs



Features from your Advisors

May 2022 (Volume 25 Issue 4)

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IRRIGATION TIMING BENEFITS WHEAT YIELD, QUALITY AND CONSERVES WATER

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

Wheat is considered flexible in growth habit and yield potential which means the crop adjusts its growth to the scarcity or abundance of water and nutrients encountered during the crop season. While the impacts of stress on crop yield is not equal across the season, the most critical periods with a high negative impact on crop productivity are jointing (stem elongation) and pollination growth stages. Looking at soil moisture data to ensure sufficient water availability prior to these sensitive stages may prevent reductions in yield potential. A good strategy is to meet the crop's water use requirements during the early vegetative growth stages and again at flowering. The early growth stages normally require less water and have a significant impact on productivity, and water stress at flowering has disproportionately impacts on yield (Mathesius et al. 2021). Approximate dates of wheat growth stages in the Imperial Valley are given in Table 1.

Table 1. Approximate dates of wheat growth stages in the Imperial Valley (Jackson and Williams, 2006). The dates and corresponding growth stages are for common wheat cultivars sown at optimal planting dates with sufficient soil moisture to initiate germination. Depending on the cultivar selected and under the most variable weather conditions, crop development may vary 7 days on either side of the dates specified. Early or late planting could also change these dates.

Growth	Emergence	Tillering	Jointing	Boot	Heading/Flowering	Milk	Soft	Hard
stage							uougn	uougn
Estimated	Dec 30	Jan 15	Feb 15	March 15	April 1	April 10	April 20	May 1
timing								

Last irrigation event in wheat

Management of crop water stress at different grain formation stages provides an opportunity to conserve water during late-season crop development without adversely affecting wheat yield and quality. Standard practice is to continue irrigation beyond physiological maturity, with the belief that high-water applications increase grain weight and yield during all crop growth stages. Researchers suggested that the last irrigation at <u>Soft Dough</u> would result in optimum grain production (Neibling et al. 2017). Water applied after this stage either remains in the soil profile or percolates below the crop rootzone, reducing water use efficiency and wasting water.

An important common characteristic of the water use curve for grains is the rapid decrease in evapotranspiration (ET) at the end of the season. Over irrigation at this point increases irrigation costs, does not increase yield or quality, may increase the chance for fungal diseases such as black point and may decrease protein and test weight specifically if the field is under sprinkler irrigation. The result of my previous research conducted in 2018 clearly verify wheat crop water use pattern in the Imperil Valley (Figs. 1 and 2). The cumulative crop water use measured from planting through harvest was 21.4 inches in the experimental wheat field. The trend of actual ET data demonstrates four individual periods with different irrigation requirements over the season including: (1) planting through mid-February (average weekly crop water use was 0.35-inch), (2) mid-February through mid-March (average weekly crop water use was 1.05-inch), (3) mid- March through first week of May (average weekly crop water use was 0.5-inch).

The data indicates that wheat crop water use was nearly 5.1-inch over the last four weeks before harvest in the wheat field. The water use is estimated 4-inch between soft dough and physiological maturity, and 1.1 inches of water in the dry down process between physiological maturity and harvest in this field.



Fig 1. Surface renewal and eddy covariance ET station in a wheat field in the Imperial Valley. The field was planted on December 21^{st} , 2017 (wet date) and harvested on May 23^{rd} , 2018.



Fig. 2. Daily actual ET measured in the wheat field during the crop season (Dec 21^{st} through May 23^{rd}).

Applying an unnecessary irrigation at the end of the season wastes water, contributes to lodging, and may delay harvest. Conversely, water stress at the end of the crop season may result in smaller and shriveled kernels, accompanied by reduced kernel weight, test weight, and yield. Depending on available soil moisture and the water holding capacity of the soil, the last irrigation is needed 1-3 weeks before the heads have completely turned color from green to tan, since the crop is physiologically mature at this point and the kernels cease to accumulate dry weight. It is usually not economical to apply a final irrigation to benefit a few green tillers in a mature crop (Ottman et al. 2012). *The last irrigation should be applied at the beginning of <u>soft dough for most loamy soils, earlier for clay soils and later for sandy soils</u>.*

Note: It is somewhat difficult to develop a description of <u>soft dough</u> that produces consistency among irrigators. Some irrigators may develop their own distinct approach which is successful for them but may not transfer well to others. One may consider the following definitions for the crop stages (Fig. 3):

- Flowering: pollen shed
- Milk: kernel liquid appears milky
- Soft dough: kernel is mealy or doughy
- Hard dough: kernel starch is firm and can be divided with a thumbnail while holding its shape



Fig. 3. Stages of grain ripening in wheat (Source: Flint 1990). The stages of grain ripening are called milk, soft dough, hard dough, hard kernel, and harvest ripe (from the top to the bottom picture, respectively).

One approach to differentiate between milk and soft dough is to squeeze the kernel and see if any fluid comes out (as in it runs down finger with gravity rather than just out of the kernel with applied force like a toothpaste). If you are getting that fluid, then you're still in the milk stage. If no free fluid comes out, but you can get a paste out of it and the kernel is obviously full and "doughy", it is soft dough. If a paste isn't coming out, you might be transitioning into hard dough.

The soft dough stage begins about 3-4 weeks after heading and 2 weeks before physiological maturity, at which point the yield has been made.

For more information, you may see the following references:

- Flint, M. L. 1990. Integrated pest management for small grains. UC ANR Publication 3333.
- Jackson, L., Williams, J. 2006. Growth and development of small grains. UC ANR Publication 8165.
- Mathesius, K., Lundy, M., Clark, N., Dias, J.L. 2021. Irrigation for wheat and other small grains in a drought year. <u>https://ucanr.edu/blogs/blogcore/postdetail.cfm?postnum=47628</u>
- Neibling, H., Rogers, C.W., Qureshi, Z. 2017. Scheduling the final irrigation for wheat and barley. University of Idaho Extension, BUL 912.
- Ottman, M., Munier, D., Orlof, S. 2012. Irrigation management for wheat. 2012 California Alfalfa and Grains Symposium, Sacramento, CA, 10-12 December.

SOME INSECT PESTS OF SEED CROPS IN IMPERIAL VALLEY

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

A number of seed crops such as bermudagrass, alfalfa, onion and brassicas are grown every year in Imperial Valley. These seed crops are due for harvest during summer. Between spring and summer, these seed crops can be infested by several insect pests. Severity of these insect pests depends on the crop and nature of damage. Therefore, it is important to know these individual insect pests and their density on the crop fields to make treatment decisions.

Bermudagrass seed production is an important industry in this region and currently many fields are at flowering or seed setting stage in the area. At this time, I have seen some infestation of the bermudagrass mirid (*Trigonotylus tenuis*) bugs in several fields. This is a small, light green, narrow, stilt-legged seed bug (Fig. 1). Both adults and immatures can feed on flowers and can reduce the plant vigor, stunting growth and delay in floret development. The treatment threshold for this this pest is 100 bugs per sweep. This threshold changes as harvest approaches. Research has shown that (1) one adult mirid/pendulum sweep 2 weeks before summer harvest can reduce uncleaned seed yields by almost 20 pounds per acre, while data indicated that nymphs had little effect at this stage of seed development.



Fig. 1. Both adults (lower) and nymphs (upper) of bermudagrass mirid bugs are often found infesting bermudagrass seed crops in Imperial Valley.

There is another sucking pest, a plant hopper (*Metadelphax propinqua*) is also often found infesting bermudagrass seed crops (Fig. 2). These are tan colored, small insects about 0.13 inches long. Feeding by these planthoppers reduces plant vigor and can result in contaminated seed heads with honeydew deposits, making the seed difficult to clean. Insecticide treatments to prevent the damage are often needed during the spring and fall seed production seasons. While there is no threshold established for this insect pest, insecticide treatment should go out when population stats to build up.



Fig. 2. A delphacid plant hopper, Metadelphax propinqua, that infest bermudagrass seed crops.

There is a different species of whitefly, which feed on grass species (species in the plant family Gramineae). This grass whitefly (*Aleurocybotus occiduus*) can be distinguished from other whitefly species such as sweetpotato whitefly (*Bemisia tabaci*) or bandedwinged whitefly (*Trialeurodes abutiloneus*) from the shape and size of the immatures (Fig. 3). Grass whitefly nymphs are elongate cigar shape rather than the oval shape of most other whitefly species and they do not have a wax fringe as do most whitefly species. Under low infestation level of grass whitefly, usually bermudagrass leaves do not show any distinctive symptoms due to feeding. However, under moderate to heavy level of infestation can cause desiccation of plants and deposition of honeydew, which may result in contaminated seed heads.



Fig. 3. Immature stage of a grass whitefly (left) compared to a sweetpotato whitefly (right). Pictures are not in scale, just to indicate the difference in shape for identification.

Recently, I was received insect sampels from a local PCA to identify as he found this insect infesting seed crop fields of kale, arugula and mizuna (all are Brassica leafy greens). Upon closer look under the microscope, it was confirmed as "false chinch bug" (*Nysius raphanus*). False chinch bug is a polyphagous insect, which means it feeds on number of plant species belong to unrelated plant families. Adults are grayish-brown, slender, and about 1/8 to 1/6-inch long (Fig. 4). Both adults and nymphs feed on plants by sucking plant sap and could reduce plant vigor and growth. Well irrigated plants can compensate for the damage by small false chinch bug population. For more information, please consult this pest note from UCANR http://ipm.ucanr.edu/PDF/PESTNOTES/pnfalsechinchbug.pdf



Fig. 4. Adults of false chinch bug. Picture on the right was taken under microscope and compared to a pencil tip to indicate the relative size.

References:

BERMUDAGRASS SEED PRODUCTION INSECT PESTS- Eric Natwick, Imperial County Agriculture Briefs, July 2011

https://www2.ipm.ucanr.edu/agriculture/bermudagrass-seed-production/Bermudagrass-Mirid/

http://ipm.ucanr.edu/PMG/PESTNOTES/pn74153.html

WELCOME TO OUR NEW MASTER GARDENER COORDINATOR



Kristian Salgado has been working for the past three years for the University of California Cooperative Extensions (UCCE)-Imperial County, Climate Smart Agriculture (CSA) program, as a Community Education Specialist II. In this position, she has greatly enjoyed working with ranchers and farmers in the low desert region brainstorming, applying, and successfully being awarded state funds that support the adoption of CSA practices. She has had the opportunity to visit feedlots and farmer's fields to see first-hand what management practices are currently used, and how the California Department of Food and Agriculture (CDFA) – Climate Smart Agriculture Grants can assist farmers in sustaining their operation in the face of Climate Change. In Mrs. Salgado's experience, farmers and ranchers greatly appreciate knowing that there is someone housed at their local Cooperative Extension dedicated solely to support and help them access these funds, and who can help demystify the grant application process.

Mrs. Salgado graduated from Cal Ploy Humboldt in 2018 (formerly known as Humboldt State University) with a Master's of Art Degree in Social Science as part of an interdisciplinary program called Environment and the Community. The E&C Program provided her with the opportunity to engage with a wide range of literature and research methods (not to mention amazing interdisciplinary faculty) that profoundly shaped her community organizing, research, and career work in the far southeastern corner of California - the Imperial Valley. It also gave her the opportunity to shape a graduate project/thesis that explored her identity and place-based knowledge as a Xicana from the small border town of Calexico where she has been working on environmental justice issues for over a decade. Mrs. Salgado's graduate research methodology is grounded in Participatory Action Research (PAR), and citizen science, environmental justice discourse, and the environmental decision-making process. She feels passionate about the proper dissemination and development of knowledge that can help support community development. As an undergraduate at San Diego State University (SDSU) she double majored in both her passions: Psychology and Environmental Studies with a minor in Counseling and Social Change.

She is excited to be the new Master Gardener Coordinator for the Imperial County, a county that will be beginning their program in 2022 with their first group of trained Master Gardeners. As an avid gardener and supporter of a handful of small community-based gardens, she can't wait to start!

APRIL 2022 CATTLECAL NEWSLETTER UPDATE

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

The April 2022 edition of the CattleCal newsletter covered using almond hulls in feedlot diets, the career and research of UC ANR Farm Smart community education specialist Stacey Amparano, and a discussion of a study looking at the effect of method of fat supplementation on feedlot steer performance and carcass characteristics. The newsletter also summarizes our ongoing feedlot research being done at UC DREC.

If you would like to subscribe to the CattleCal newsletter, please visit this site and enter your email address: <u>http://ceimperial.ucanr.edu/news_359/CattleCal_483/</u>

November CattleCal podcast episodes:

- Quiz Zinn

In this episode, we asked Dr. Richard Zinn a question from our listeners related to using almond hulls in a feedlot diet.

- Career Call

Brooke Latack and Pedro Carvalho called Stacey Amparano, UC ANR Farm Smart community education specialist, to talk about her background in agriculture, some experiences traveling around the country after graduation from college, and an introduction to the Farm Smart program.

- Research Call

Brooke Latack and Pedro Carvalho speak to Stacey Amparano, discussing the Farm Smart Program at UC Desert Research and Extension Center and the experience and importance of teaching kids about Agriculture.

- Feedlot Research Call

In this episode, join Pedro Carvalho and Brooke Latack as they discuss research looking at the effect of method of fat supplementation in feedlot diets on feedlot cattle performance.

The podcast can be found at

<u>https://open.spotify.com/show/6PR02gPnmTSHEgsv09ghjY?si=9uxSj3dYQueTEOr3ExTyjw</u> 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 <u>cattlecalucd@gmail.com</u> 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) – <u>bclatack@ucanr.edu</u> Pedro Carvalho (CE Feedlot Management Specialist) - <u>pcarvalho@ucdavis.edu</u> CattleCal: <u>cattlecalucd@gmail.com</u>

Agronomic Crops and Irrigation Water Management Field Day (Virtual) UCCE Imperial County - May 5, 2022

Registration link: <u>https://surveys.ucanr.edu/survey.cfm?surveynumber=36996</u>

	9:00 a.m. – Noon						
9:00	Welcome address and an overview of current UCCE studies on field crops - Oli Bachie, UCCE Imperial County Director						
9:10	Rules and Regulations for water sanitizers - Valeria Mejia, Agricultural Biologist, Imperial County Ag Commissioner Office						
9:25	Alfalfa– more salt tolerant than established guidelines indicate - Sharon Benes, Professor and J.G. Boswell Endowed Chair in Plant Science, California State University, Fresno						
9:40	Halt soil salinization, boost productivity and sustainability: what we've learned in recent years in the low desert - Ali Montazar, Irrigation and Water Management Advisor, UCCE Imperial County						
9:55	Interactive webtools for improved, site-specific management of agronomic crops - <i>Mark Lundy,</i> <i>Assistant Specialist in Cooperative Extension, UC Davis</i>						
10:10	Alfalfa and tall fescue breeding and evaluation in the low desert - Charles Brummer, Director of the Plant Breeding Center, UC Davis						
10:25	Grower insights on modern irrigation technologies - Ronald Leimgruber, Leimgruber Farms						
10:30	Can you achieve high application efficiencies with flood irrigation? Introducing high performance surface irrigation - Peter Moller, Rubicon Water						
Break							
10:40	UC Industrial hemp trials - <i>Dan Putnam, Extension Agronomist and Forage Specialist, UC Davis; and Bob Hutmacher, Cooperative Extension Specialist and Center Director, UC West Side REC</i>						
11:00	Resource management for effective crop productivity - Oli Bachie, Agronomy Advisor, UCCE Imperial County						
11:15	Sugarbeet pest management in the low desert - Apurba Barman, IPM Advisor, UCCE Imperial County						
11:30	Insecticide resistance management for alfalfa weevil - <i>Ian Grettenberger, Assistant Specialist in Cooperative Extension Entomology, UC Davis</i>						
11:45	Granulate cutworm in low desert alfalfa - Michael Rethwisch, Crop Production and Entomology Advisor, UCCE Riverside County						

For additional information on the workshop, please contact organizers Ali Montazar, <u>amontazar@ucanr.edu</u> or Oli Bachie, <u>obachie@ucanr.edu</u> or Apurba Barman, <u>akbarman@ucanr.edu</u> or give us a call at (442) 265-7700

Approved Continuing Education Units:

CALIFORNIA DPR (Course ID #M-0698-22 – 1.5 hrs.), Arizona Dept. of Agriculture (Course ID #21986 - 1.5 hrs.), CCA (Tracking No. #CA 59258 – 3.0 hrs.)

* Test will be given immediately following workshop for Virtual meeting attendees that are seeking CA DPR CEU *

UCCE Presents a FREE Webinar Series:

Managing Land and Livestock on Small Acreages Wednesdays, April 20, 2022 to June 1, 2022 6:00 -7:00 PM via Zoom



Register here:

http://ucanr.edu/acreages

Join us to learn all about: **Irrigated Pasture Planning and Nutrition** Weed ID and Management **Backyard Poultry Production Outdoor Hog Production Small Flocks of Sheep and Goats Marketing Small-Scale Production Livestock Forensics: Mortality Diagnosis**





SEED SAVERS WORKSHOP

LEARNING THE BASICS TO HARVESTING SEEDS

If your garden looks anything like the Desert Research Extension Centers (DREC) Farm Smart U-Pick fields, then it is bursting with valuable seeds that can be easily harvested and saved for next winter. Plants in your garden that are most likely bolting (entered seed production mode) due to the warmer temperatures (above 80 F) are lettuce and cilantro. Before removing these plants to make way for your spring or summer crops, it' worth taking the time to harvest them.

If you are interested in learning about harvesting cilantro (coriander) or lettuce seed, please join the University of California Cooperative Extension (UCCE) Imperial Cal Fresh Program, on Wednesday, May 11th, at 3:30pm at 1004 Holton Rd, Holtville for an introduction in seed saving. The new UC Master Gardener Coordinator, Kristian Salgado, will also be joining us for this workshop, so if you are interested in learning about the UC Master Gardener program, and how to be trained as a UC Master Gardener this is the workshop to attend. New and experienced gardeners are welcome!

You can register at https://ucanr.edu/Seeds.



DREC Farm Smart U-Pick Fields on April 26, 2020

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_0 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.



	May		June		July	
Station	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

	Table 1.1	Estimates of	average dail	v potential	evapotrans	piration	(ET_0)	in inch	per dav
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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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