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Features from your Advisors

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MAKING THE MOST OF SUMMER: SOLARIZATION AND BIOSOLARIZATION FOR SOILBORNE PATHOGEN CONTROL IN THE LOW DESERT

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Summer is here, and it's the perfect time to start thinking ahead to the next vegetable season and how to make the most of what summer gives us to strategize against plant pathogens. In addition to crop rotation, two of the most effective tools we have to tackle soilborne diseases, and those that survive the summer in buried crop debris, are soil solarization and biosolarization. Solarization and biosolarization are among the most promising non-fumigant soil disinfestation techniques available today, especially for California's inland valleys. In regions like the Imperial and Coachella Valleys, extreme summer temperatures and clear skies offer ideal conditions for passive solar heating. Additionally, many growers already have access to local sources of organic waste that can be used for biosolarization. In this article, I'll take a closer look at both techniques and how we can use them most effectively in low desert areas to keep our soil as clean and pathogen-free as possible.

Soil Solarization: Soil solarization is a relatively simple and affordable technique that uses clear plastic tarps to trap solar energy, heating the top layers of moist soil to temperatures high enough to kill many pathogens, nematodes, and weed seeds. In the Imperial Valley and similar desert areas, this method works particularly well because of the region's high summer temperatures and intense solar radiation.To begin, growers should prepare beds as they would before planting. The soil should be well-tilled, free of large clumps, and leveled to ensure even heating. Moisture is critical; soil should be irrigated to field capacity just before laying the solarization plastic. Without adequate moisture, the heat won't penetrate deep enough to be effective. After irrigating, clear polyethylene plastic (25–50 microns thick) is laid tightly over the beds. The edges should be buried to trap the heat and prevent air flow underneath (Fig. 1).

Figure 1. Preparation of soil beds for solarization. Plastic tarps are placed to seal the beds to retain moisture and limit oxygen entry into the soil.

Picture source: UC IPM

Solarization should last at least 4 to 6 weeks, ideally during July and August, when the sun is strongest. Research has shown that in desert regions, temperatures in the upper 15–30 cm of soil can exceed 50–60°C, which is sufficient to inactivate many common plant pathogens, as well as weed seeds and nematode eggs. The top 5–10 cm of soil receives the most heat, but the effect can be extended below with longer duration.

Biosolarization: Biosolarization builds on the solarization process by incorporating organic amendments into the soil before covering it. These can include compost, crop residues, tomato or grape pomace, green manures, or other high-carbon materials. As these materials decompose under the plastic, microbial activity produces volatile organic acids, ammonia, and other antimicrobial byproducts that help suppress soilborne pathogens and weeds. This combination of biological and thermal control can result in greater and more consistent pathogen suppression than solarization alone.

To perform biosolarization, follow the same steps as for solarization: bed preparation, irrigation, and plastic covering, but add an amendment incorporation step before laying out the plastic. The organic material should be incorporated into the top 15–30 cm of soil at an appropriate rate (typically around 10–20 tons per acre, depending on the material). After incorporation, irrigate to activate microbial decomposition of the organic materials, then lay the plastic and seal it just as you would for solarization.

The fermentation process begins quickly under the heat and moisture, producing a burst of microbial activity and bioactive compounds. These substances can help inactivate tough fungal pathogens and nematodes and may also enhance beneficial microbial populations over time. While the plastic cover and elevated temperatures might seem likely to suppress microbial life, many beneficial microbes—especially heat-tolerant and anaerobic species—can survive or even thrive under these conditions. The process should continue for 1-3 weeks during peak summer heat to maximize its effectiveness.

One caution with biosolarization is the potential for phytotoxicity, especially when using amendments that are high in nitrogen or readily degradable, as they can generate excessive ammonia, volatile fatty acids, and other toxic byproducts during decomposition, which may remain in the soil after treatment and inhibit crop growth or injure sensitive crops. To avoid this, it’s important to 1) Choose well-composted materials or those with a known track record in biosolarization; 2) Avoid very high amendment rates; and 3) Allow the soil to aerate for 1–3 weeks after plastic removal and before planting. This gives any residual toxins time to dissipate. Then, using the right amendment choice, particle size, and timing, biosolarization remains a safe and highly effective tool.

In summary, these methods offer effective suppression of important plant pathogens and can be part of a broader and integrated soil health strategy, as they help reduce inoculum levels, break disease cycles, and improve soil microbial function. The cost and practicality of solarization and biosolarization vary based on factors such as location, target crop–pest combinations, scale, treatment effectiveness, duration, yield impact, and availability of resources. While both methods are safe and effective, biosolarization stands out for its shorter treatment time, making it especially valuable for time-sensitive crops. This is particularly true in sunny, low desert regions, where high summer temperatures may allow effective treatment in as little as one week under plastic.

Reference

https://www.cdpr.ca.gov/wp-content/uploads/2025/03/ccst_fumigants_study.pdf

RESULTS FROM A RESEARCH TRIAL ON THE ERODIBILITY OF SOIL-APPLIED FERTILIZERS IN LOW DESERT SUDAN GRASS

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Backgrounds

Crops require more nitrogen than all other plant nutrients. In anticipation of maximizing hay production, growers of the low desert could apply large amounts of N fertilizers, at rates varying from 150 to over 800 lbs N/acre during the growing cycle of Sudan grass hay production. Growers also may over-irrigate Sudan grass fields to flush out high salt accumulation from irrigation water. Excessive fertilization, coupled with excessive irrigation, can cause fertilizers to move out of the crop root zone through erosion or leaching, ultimately entering the drainage system and contributing to environmental pollution and damage to ecological and aquatic life. Surface movement of nitrogenous fertilizers, either through the soil or via irrigation water, suggests the erodibility of the fertilizer(s). In other words, erodibility may refer to the soil's or nitrogenous fertilizer's susceptibility to erosion caused by raindrops, irrigation, or runoff, quantified as the average rate of soil loss per unit of water erosivity. The loss of soil or nutrients from farmland may be reflected in reduced crop production potential and/or lower surface water quality.

Nitrogen fertilizer is widely used in farming but has recently been implicated in surface and groundwater pollution. Synthetic nitrogen fertilizer application rates increased an average of 25% between 1973 and 2005 (Tomich et al., 2016). MPCA (2013) states that up to 95% of the nitrate load in river waters is agricultural in origin. Excessive use of fertilizers can erode and accumulate at the tailwater (Figure 1), ultimately ending up in the drainage system. Nitrogenous fertilizers are particularly mobile and move into and out of the soil, forming part of the nitrogen cycle (Figure 2). Nitrogenous fertilizers can undergo several chemical transformations, converting into inorganic nitrate (NO_3^-) that plants can take up, be converted back to nitrogen gas, or leach into groundwater or enter surface water as runoff. This occurs because the negatively charged NO_3 - ion in the soil water is not held by soil particles. However, the magnitude and mechanism responsible for nitrogen movement may depend on the chemical and physical properties of the

Figure 1: Irrigation water accumulates as tailwater

soil, slope, and vegetation cover. The amount of fertilizer that is not taken up by crops and lost into the environment through leaching or runoff results in reduced nitrogen use efficiency (NUE), environmental pollution, and contamination of both ground and surface water, typically occurring due to agricultural intensification (Singh & Craswell, 2021). Excessive amounts of nutrients that erode or leach may also cause eutrophication, the depletion of oxygen in the aquatic systems, preventing proper functioning of natural microorganisms (Hire, et al., 2011). For example, irrigation drainage in the Imperial Valley often ends up in the Salton Sea, resulting in severe damage to aquatic life due to eutrophication. Nitrate contamination (eutrophication) is also manifested by a proliferation of green algae, reduced infiltration of light, oxygen depletion in surface water, disappearance of benthic invertebrates, and the production of toxins harmful to fish, livestock, and humans (Howarth, 2008). Nitrogen pollution of lakes, groundwater, and rivers is an alarm for agricultural producers to assess their potential contribution to fertilizer-based pollution.

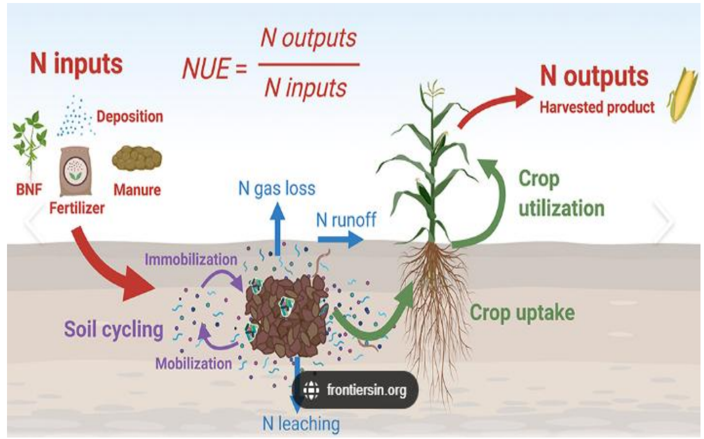

Figure 2: The nitrogen cycle and potential exchanges (internet source)

Field experiment

In an experiment conducted at the UC DREC to determine the optimal fertilizer and irrigation water, we assessed the erodibility of nitrogenous fertilizers by measuring the nitrate (NO_3) concentration in the tailwaters of an irrigated Sudan grass field. The soil of the experimental field is low in organic matter, moderate in nitrate (NO_3) levels, and relatively high in pH (Table 1). The field was irrigated at three irrigation levels: low (80%ET), moderate (100% ET), and high (120% ET).

Date	6/25/2024	6/25/2024	6/25/2024	6/25/2024		
Area	BLOCK 1	BLOCK 2	BLOCK 3	BLOCK 4	Optimum Levels	
Soil Depth	--	--	--	--	Low	High
Total N *(Combustion%)*	0.06	0.07	0.07	0.06	-	-
Est. Org. Matter *(%)*	1.02	1.12	1.11	1.03	-	-
Org. Matter (Walkley Black) *(%)*					-	-
Ammonium NH4-N *(OLSEN/PPM)*					-	-
NO3-N *(OLSEN/PPM)*	10.2	38.7	46.0	25.1	25.0	50.0
PO4-P *(OLSEN/PPM)*					10.0	20.0
K *(OLSEN/PPM)*					80	160
SP *(SATURATION PASTE%)*					30.0	70.0
Soil Texture *(ESTIMATED)*	n/a	n/a	n/a	n/a	-	-
CEC *(MEQ/100 GMS)*	0.0	0.0	0.0	0.0	-	-
Chloride *(OLSEN/PPM)*					-	-
ECe dS/M *(SATURATION PASTE dS/M)*					2.0	4.0
pH *(SATURATION PASTE/UNITS)*	7.89	7.84	7.84	8.04	6.50	7.50

Table 1: Some characteristics of the trial field soil (collected at pre-plant from all four blocks)

The watermark data for the irrigation levels indicate potential water stress in the 80% ET treatment, but not in the other two irrigation treatments (Figure 3). The field was also treated with variable fertilizer inputs: (1) 50 Lbs of N/acre (N1), (2) 80 lbs of N/acre (N2), and (3) 25 lbs of N/acre (N3) for the harvest season. In a split-plot design, irrigation treatments were used as main plots, and fertilizer treatments were used as subplots. Each treatment plot was 20 ft x 60 ft. NO_3-N concentration data in the tailwaters of the treatment plots were collected during the last Sudan grass harvest on August 8, 2024. A One-way ANOVA test (SAS) was performed to test for differences in soil NO_3 concentration in tailwaters.

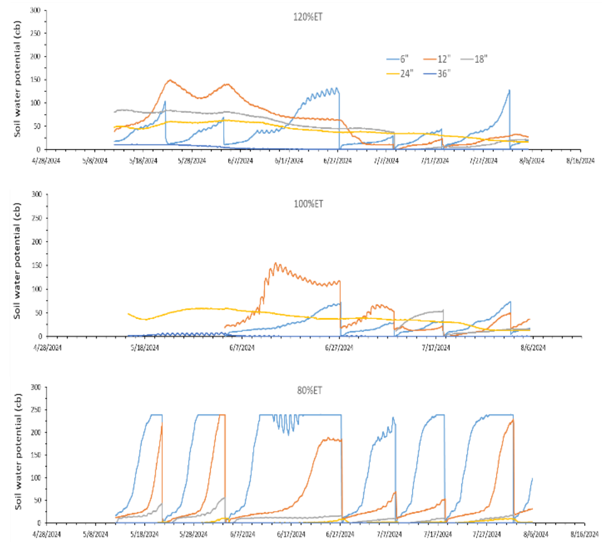

Figure 3: Soil water potentials for the 120 (top), 100 middle), and 80% ET irrigations at 6, 12, 24, & 36" soil depth

Results and discussion

Nitrate-N was detected in tailwaters under all irrigation and fertilizer treatments (Figure 4). There was no significant difference ($p=0.9438$) in the amount of NO3-N in tailwaters between the irrigation treatments (Figure 3), indicating that even a slightly deficient irrigation (80%ET) can carry NO3-N to the tail of an irrigated field. The slightly higher NO3 concentrations under the slightly deficient irrigation level, relative to the optimum and higher irrigation levels (Figure 5) may have been due to a higher dilution factor under higher amounts of irrigation water. Nitrate concentrations in tailwaters were significantly different based on the amount of applied fertilizer inputs ($p<0.0001$) (Figure 6). The 80 lbs N/acre (N2) fertilizer rate had higher nitrate levels than the 50 and 25 lbs/N/acre (Figure 5) in the respective treatment tailwaters. There were no significant differences in tailwater NO3 concentration between the 50 and 25 lbs N/ ac fertilizer applications. All fertilizer treatments, even as low as 25 lbs N / acre, resulted in its NO3-N moving (eroding) into the tailwater, although in smaller amounts than the higher fertilizer applications (Figure 6). The findings suggest

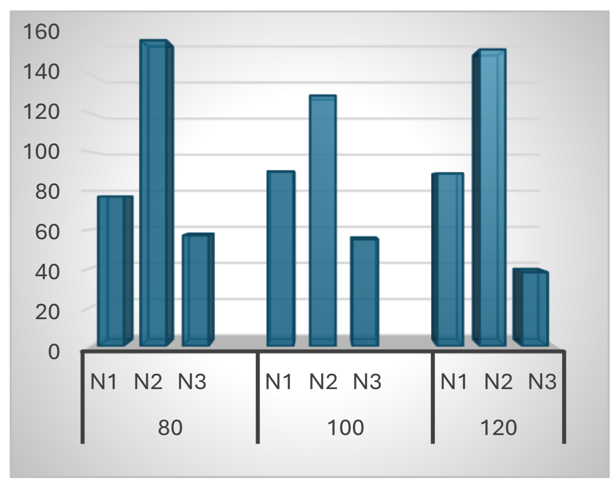

Figure 4: Mean NO3 concentration in tail waters of fields treated with 3 irrigation (80,100 and 120%ET) and 3 fertilizer levels (25, 80 and 25 lbs N/ac)

that higher rates of fertilizer inputs, exceeding 50 lbs N/acre, result in a greater amount of NO3-N that can move to the tailwater and ultimately into the drainage water. There was no interaction between irrigation levels and the amount of fertilizer inputs ($p = 0.7872$) on NO3-N in tailwaters. Researchers suggested that nitrates can accumulate in the soil if addition rates exceed rates of uptake by crops. These researchers observed higher nitrate concentrations under higher nitrogen fertilization rates compared to lower rates of fertilizer. In addition to crop nitrate uptake, tillage methods and rainfall amounts may contribute to differences in nitrate concentrations between fields. Nitrogen accumulation is thought to occur less quickly in strip-tilled fields (Angle et al., 1993). A large amount of rainfall during the crop-growing season decreases soil nitrate concentrations due to enhanced leaching or erosion from the fields.

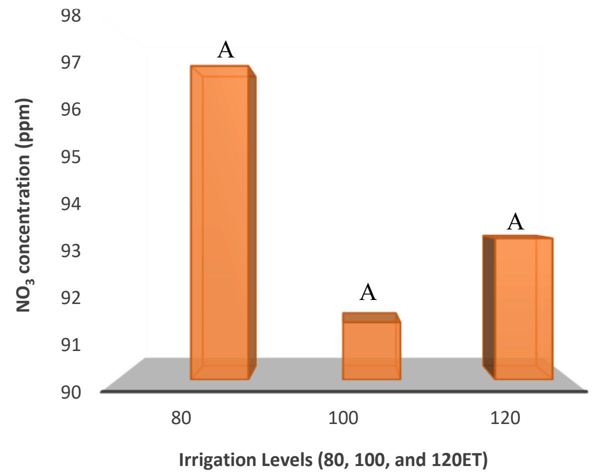

Figure 5: Amount of NO3 detected in tailwater of fields irrigated with 80, 100, and 120%ET, respectively. Bars with the same letter indicate no significant differences (p=0.9438)

Soil and nitrate erosion can also be influenced by factors such as the field's steepness, slope length, vegetation cover, soil aggregate composition, water and soil conservation practices, crop types, and other agricultural management practices. For example, cover crops may improve soil stability by creating stronger soil aggregates, improving infiltration rates, and reducing erosion risks. Because of plant uptake, little nitrate nitrogen (NO_3-N) leaches from soils on which a crop is actively growing. Soils with faster infiltration rates, higher levels of organic matter, and improved soil structure may have a greater resistance to erosion. Accordingly, sandy, sandy loam, and loam textured soils tend to be less erodible than silt, fine sand, and certain clay textured soils. Tillage and cropping practices that lower soil organic matter levels lead to poor soil structure and contribute to increased soil erodibility. Naturally, the steeper the slope of a field, the greater the amount of soil and nitrate loss from erosion.

Although our data do not yield an optimal recommendation for irrigation nitrogen fertilizer input, they do provide information that can be used to inform ecologically sustainable management of farm fields. Our findings suggest that irrigation water, regardless of its amount, can move or erode nitrates towards the irrigation tail. The finding also suggests fertilized agricultural fields, coupled with irrigation water, can move or erode much of the fertilizer nitrates into tailwater. The higher the fertilizer levels, the higher the NO3-N detected in the tailwaters. The higher amount of NO_3-N in tailwater from the higher fertilizer application suggests that excess nitrogen is susceptible to runoff, relative to the amounts applied. The findings, in general, can serve as a guide in providing relevant information to farmers on best management practices to avoid fertilizer and irrigation-based ecosystem pollution and resource loss. Growers must also be aware of the amount of irrigation water and the rate of fertilizer they apply to crop fields. In some cases, split applications of fertilizers can be beneficial over a single application, particularly when excessive fertilization is avoided. The rates of nitrogen used and the timing of application should be adjusted according to soil conditions and crop requirements to minimize losses due to leaching and erosion.

Please note that the NO_3 erodibility data or findings presented here are from a small research plot and may not necessarily be representative of larger commercial and extended Sudan grass production fields. Furthermore, the erodibility data were collected only for one cropping season. For the reliability and confirmation of the findings, repeated season data collection and analysis are important. We intend to collect more data during the upcoming cropping seasons. However, we believe that the finding could be informative of the potential of irrigation and fertilizers in enhancing nutrient leaching or run-off effects.

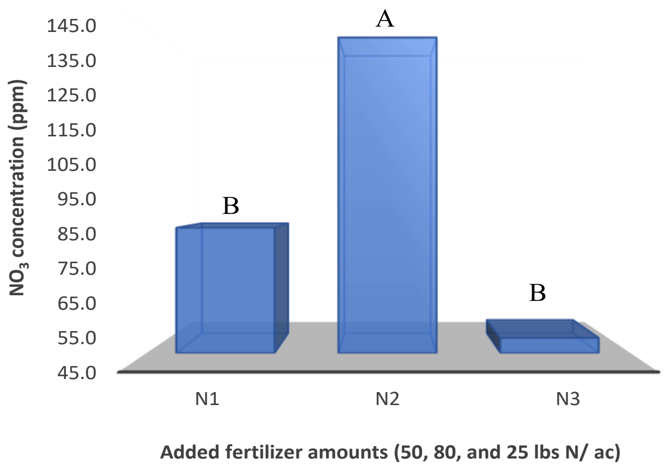

Figure 6: Amount of NO3-N in tailwaters of plots fertilized with 50, 80, and 25 lbs N / ac. Bars with different letters indicate significant differences ($p<0.0001$):

Nitrate concentration in soils, water, or plant sap can be measured quickly using a simple handheld selective electrode meter (e.g., Horiba or other types) (Figure 7). Soil or water samples can provide an estimate of nitrate-nitrogen (NO_3—N) present in the soil or water. Proper fertilization and control of surface runoff and erosion can be achieved through a thorough understanding of crop irrigation and nutrient requirements.

Figure 7. Example of a Horiba selective electrode

Nitrate loss through leaching or erosion can be prevented. The most effective way to avoid the losses from agricultural lands is through effective soil and water management practices. Coupled with the high cost of nitrogen fertilizer, the loss underscores the need for an optimal amount of nitrogen fertilizer to be used in a manner that effectively balances economic benefits and promotes environmental sustainability. Strip or minimum tillage that causes minimum disturbance to the soil surface, changes in the schedule of nitrogen fertilization, and minimum tillage (Wolkowski et al., 2009) or applying fertilizers when efficient crop nutrients occur (Scharf & Lory, 2006) could protect against soil erosion and decrease the amount of nitrogen entering the hydrological system. Applying fertilizers with a split schedule is another way to reduce nitrogen loss (Cassman et al., 2002).

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AREA-WIDE MONITORING OF KEY INSECT PESTS ACROSS THE IMPERIAL VALLEY: JUNE 2025 UPDATES

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This article is intended to provide growers, PCAs, and other stakeholders with information on the adult pest activity of whiteflies, aphid complex, western flower thrips, and flea beetles across the Imperial Valley. The data were collected using a yellow sticky trap network maintained by the UCCE Entomology program. The yellow sticky traps set up in each site consist of a 6 × 12 in (15.2 × 30.5 cm) sticky trap (Olson Products, Medina, OH), shaped into a cylinder, attached to a wooden stake using a binder clip, and positioned about 60 cm above the ground (Fig. 1A and 1B). The traps are distributed throughout the Imperial Valley in major agricultural areas (Fig. 1C). Insects that are attracted to the yellow colors get trapped on the sticky surfaces when they land on the surface during their flight. The traps are replaced weekly. The type and abundance of trapped insect pests are examined in the laboratory using a stereo microscope.

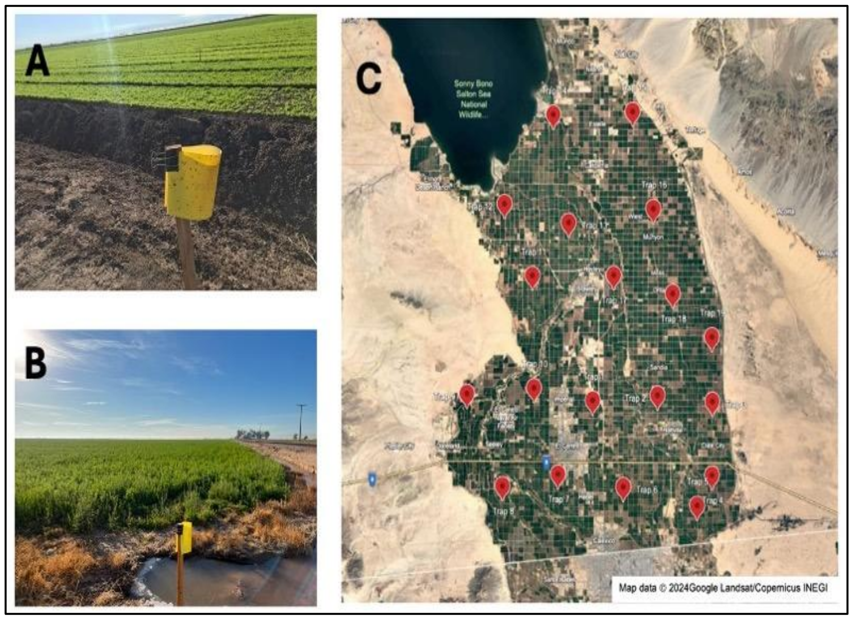

Figure 1 A & B. Yellow sticky traps in various fields, and C) Trap locations across the Imperial Valley

Insect count data from the sticky traps could help forecast the adult insect activity of targeted pests around crop fields. However, since several biological (crop type, crop age, presence of weed hosts, etc.), physical factors (temperature, wind, precipitation, etc.), and farm operations (insecticide sprays, dust from the land preparation, crop harvest, etc.) can influence insect populations development in the field and trap capture efficiency, the insect numbers in sticky traps do not always strongly correlate to the actual infestation levels in the grower's fields. Despite this, the insect pest counts from the sticky traps are a valuable indicator of adult insects' prevalence across a landscape. Collecting data on trapped insects across multiple years may help establish a baseline of pest activity and potential crop infestations throughout the season. Such historical pest data can then be compared with current pest activity in the traps to identify population trends. The sticky traps can also be screened to detect invasive insect pests, such as Asian citrus psyllids, spotted lanternflies, and Mexican fruit flies.

Insect count updates until 25 June 2025

The insect counts from the monitoring trap network are presented below (Figures 2, 3, 4, and 5). Each dot in each of the graphs represents the average insect count from 19 traps placed across the Imperial Valley for that sampling week, with the value expressed as the number of insects per trap per day.

Whiteflies: The whitefly counts (Fig. 2) in the traps consisted mainly of sweetpotato whitefly (*Bemisia tabaci* MEAM1), but also a small fraction (< 5%) of bandedwinged whiteflies, *Trialeurodes abutilonia*, and other minor whitefly species. We have observed an increase in adult whitefly activity over the last couple of weeks, with their numbers steadily rising since mid-May.

Aphids. The trap count data for aphids (Fig. 3) do not focus on any single species but represent the aphid complex in the Valley. The aphid population in the Imperial Valley was relatively active before mid-February but has since declined to near-zero alate aphid activity.

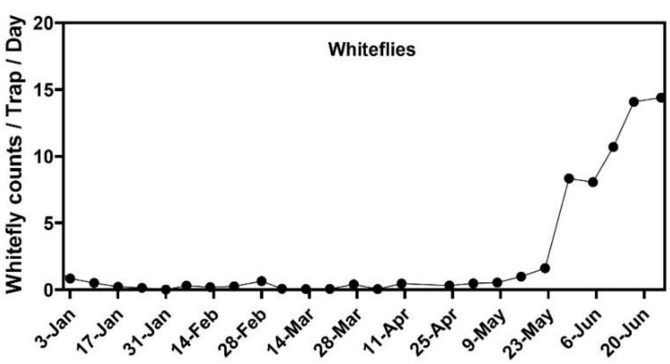

Figure 2. Whitefly counts from the traps

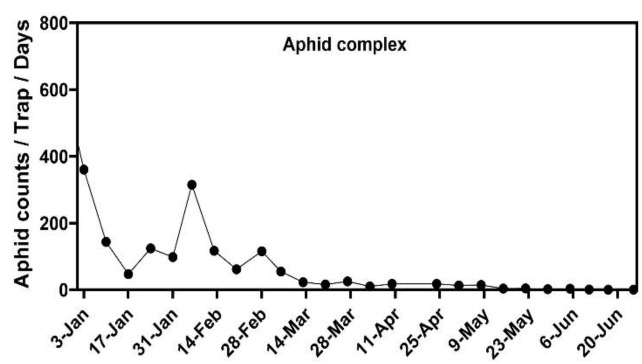

Figure 3. Aphids count from the traps

Flea beetles. The flea beetle counts on the traps (Fig. 4) comprised the pale-striped flea beetle, *Systena blanda*, the desert corn flea beetle, *Chaetocnema ectypa,* and other minor species. Currently, we are observing very high adult activity across the Imperial Valley.

Western flower thrips. Several thrip species were captured in the traps, but only western flower thrips, *Frankliniella occidentalis,* the major thrip species of concern for several crops of the Imperial Valley, were counted. Western flower thrips peaked between the last week of February and late April, but their abundance significantly declined after the last week of May.

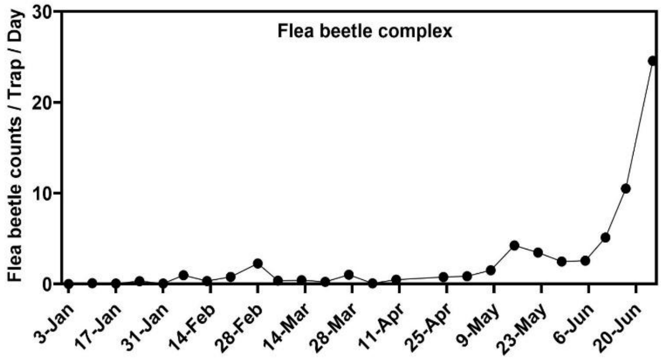

Figure 4. Flea beetle count from the traps

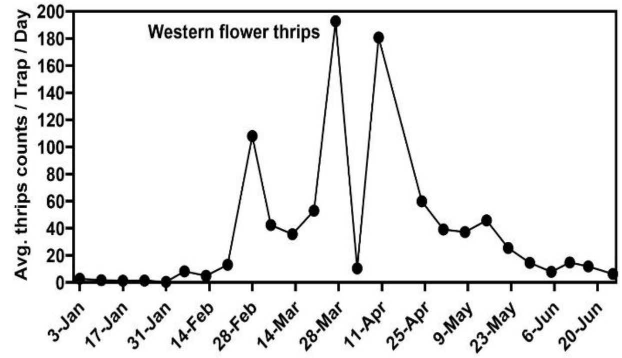

Figure 5. Western flower thrips count from the traps

Additional biweekly updates of trap capture data are available from the UCCE Imperial County Entomology webpage, which can be accessed at https://ucanr.edu/county-office/cooperative-extension-imperial-county/imperial-valley-areawide-pest-monitoring. If you are interested in additional data from this project or have questions or comments, please contact Arun Babu at (442) 265-7700 or arbabu@ucanr.edu.

Acknowledgements

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IMPERIAL VALLEY CIMIS REPORT AND UC WATER MANAGEMENT RESOURCES

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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, including 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 ETo for the period of July 1st to September 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 inches per day

Station	July		August		September	
	1-15	16-31	1-15	16-31	1-15	16-30
Calipatria	0.32	0.31	0.30	0.28	0.26	0.23
El Centro (Seeley)	0.33	0.31	0.30	0.28	0.26	0.25
Holtville (Meloland)	0.32	0.31	0.30	0.28	0.26	0.24

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/.

A NEW RACE OF BREMIA LACTUCAE, BI: 9US, HAS BEEN IDENTIFIED AND NOMINATED IN THE WESTERN US

The International Bremia Evaluation Board – US

Bremia lactucae, the pathogen that causes downy mildew of lettuce, is genetically very variable. Multiple isolates that differ in their ability to overcome resistance genes may be present even within one lettuce production field. Many isolates are of minor importance because they do not persist. Isolates with the same virulence that occur at several geographic locations, persist over multiple years, and have stable virulence are considered for nomination as a race. Eight races (previously known as pathotypes) have been denominated so far in the Western US, describing much but not all of the variation observed to date. The first four races have not been observed for many years and are no longer considered as relevant for describing resistance of cultivars to downy mildew. Full descriptions of isolates historically observed in the Western US can be found at http://bremia.ucdavis.edu/.

The International Bremia Evaluation Board-US, IBEB-US, is comprised of representatives of seed companies and public institutions; its primary function is to collect and characterize field isolates of *Bremia lactucae* and nominate new races. IBEB-US and IBEB-EU are regional associations that are coordinated by the IBEB Global Coordinating Body (IBEB-G). IBEB-US and IBEB-EU use a standard set of differential resistant varieties for characterization of isolates and the same procedure for race denomination. The nomenclature of races has also been standardized. The pathogen populations in the Western US and Europe are different. Therefore, the races in the Western US are postfixed with –US and those from Europe with –EU; races with the same number from the US and EU are not the same. The regional committees are responsible for communication with the growers and for race nomination within their areas.

A group of isolates with a new ability to overcome resistance genes was identified in 2015 and was detected again in 2016 and 2017. It was therefore nominated as Bl: 9US. Formal evaluation was done by IBEB-US, and the group of isolates is now denominated as Bl: 9US, sextet code: 61-25-02 (EU-C).

IBEB-US emphasizes that although breeding companies supply growers with lettuce varieties possessing resistance to the denominated Bl: 5 to 9US races, this resistance is not a full insurance against downy mildew. The declared resistance gives the grower protection against these races. However, downy mildew disease may be caused by rarer isolates with novel virulence characteristics that have yet to be denominated as races. It is also important to consider the industry standard of resistance: The ability of a plant variety to restrict the growth and development of a specified pest or pathogen and/or the damage they cause when compared to susceptible plant varieties under similar environmental conditions and pest or pathogen pressure. Resistant varieties may exhibit some disease symptoms or damage under heavy pest or pathogen pressure. IBEB-US also emphasizes the importance of chemical control and hygiene measures in addition to plant resistance. Fungicide application, especially at a young plant stage, gives additional protection to resistant lettuce crops, which will help prevent the development of new races of *Bremia lactucae*.

For more information: IBEB-US

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Agriculture and Natural Resources | Cooperative Extension

The UCCE Imperial Livestock Program presents

INTERN PRESENTATION DAY 2025

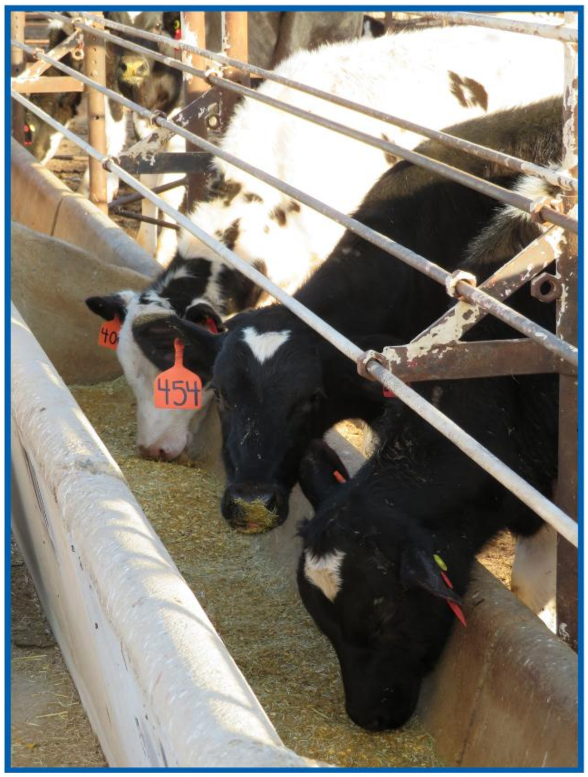
About Our Workshop

The 2025 UCCE Imperial Livestock program summer interns will be presenting about topics related to beef cattle production. This is a largely self-led project that highlights things they have learned throughout the summer. The interns are local students of Holtville High School, Imperial High School, and Southwest High School.

We invite anyone in the agriculture community to come and enjoy the presentations produced by the hard work of this year's interns!

Presentation Topics:

- Feedlot Design
- Global Beef Production
- Perceptions of the cattle industry
- How behavior affects cattle grazing



When

July 23, 2025
10 -11:30 am

Where

UCCE Imperial offices
1050 E Holton Rd
Holtville, CA 92250

Cost

FREE

Please rsvp to Brooke Latack by emailing bclatack@ucanr.edu or call/texting 269-313-2579
Feel free to reach out with any questions