Imperial County Agricultural Briefs

Features — **From your Farm Advisors**

University of California
Agriculture and Natural Resources
UC Cooperative Extension

December, 2013

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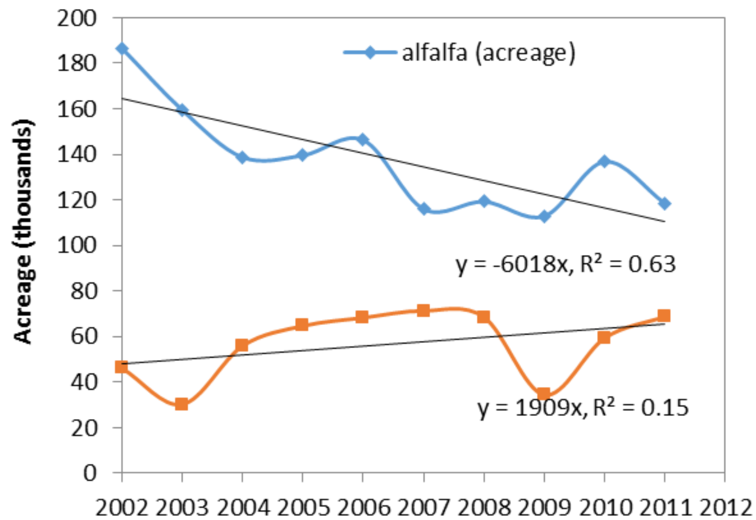
Alfalfa and Sudangrass Acreage and Yield Trends for the Imperial Valley2

Oli Bachie

Alfalfa and Sudangrass are two of the major forage (hay) crops of the Imperial Valley. A wide range of varieties are used for both crops. While CUF 101 has been the most popular alfalfa variety grown in the Imperial Valley, other varieties such as Mecca, Cibola, Highline, Impalo and La Jolla have also become popular. For Sudangrass, Piper is the most common for its high yielding and a quality characteristic desired for the export market. In all cases, crop varieties may be selected for yield, pest resistance and quality. While acreage and yield of any crop may depend on the commodity market, the type of the variety, the environment and crop management conditions, the general trends of alfalfa and sudangrass production in the Imperial Valley is shown in Figures 1 and 2, below.

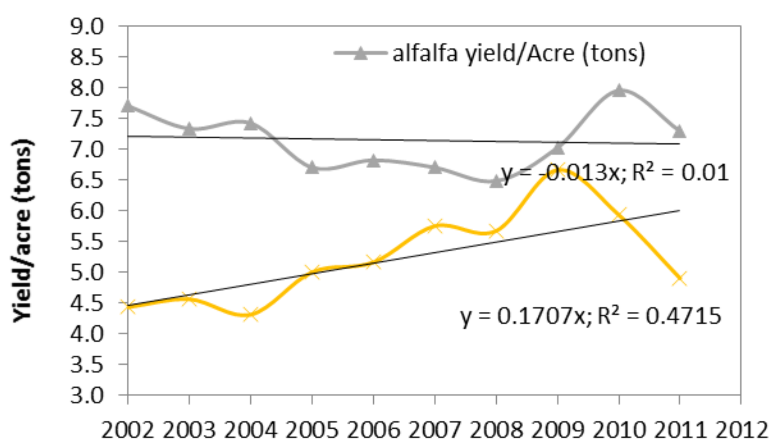
The data indicates that that land area (acreage) planted to alfalfa within the Imperial Valley has declined over the last 10 years at a rate of about 6.000 acres per year. It has declined to about 120,000 in 2011 from what used to about 190,000 acres in 2002. In the meantime, acreage for sudangrass has remained fairly consistent, although there has been a sharp decline between 2008 and 2009. The boom in Sudangrass acreage from 2009 onwards might have been due to an increased hay export to China and Japan. Future trends of alfalfa and sudangrass production is not very clear. However, the continued increase in demand for internal consumption and export may derive an increased land area allotted to these two crops. Furthermore, the continued improvement in genetics and crop production technologies that may involve reduced resource consumption of these crops may attract growers to put increased emphasis on the production of these crops.

On the other hand, yield per acre (tonnage) of alfalfa has remained very consistent over the last 10 years (Figure 2) while that of sudangrass yield/acre has increased tremendously up until



Production

Figure 1: acreage planted to alfalfa and



Production years

Figure 2: yield per acre of alfalfa and

2009. Yield decline in sudangrass since 2009 may be related to poor crop management while attempt to catchup with the export market demand with large acreage allocation that might have created poor management and maintenance of the crop.

3		Summarized from the Field Crops Guidelines, University of California, Agriculture & Natural Resources, Imperial County office

Improving Flood Irrigation Systems Efficiency

Khaled M. Bali

The advantage of flood irrigation system method is that it is inexpensive, both in terms of system costs and energy costs. The disadvantage is that its performance depends strongly on soil properties such as the infiltration rate and soil type. It is the most difficult irrigation method to manage efficiently because of its dependence on soil properties and its performance characteristics, and thus, a trial-and-error approach is normally used in its management.

Border or flood irrigation designs have several common features. They usually have slopes from 0.1% to 0.2% (1 to 2 ft per 1000 ft of run), include small 'border checks' (or small levies) 6-20" high, which confine water to an area from 10 to 200 feet wide so that water moves down the field. Field length in the direction of flow varies, but is usually determined by field constraints and soil characteristics. Sometimes flood systems are combined with 'corrugated' or 'bedded' systems which facilitate water movement and drainage on heavy soil.

Improving Flood Irrigation Systems

Flood irrigation systems can be improved by reducing deep percolation below the root zone and reducing surface runoff. However, measures to improve flood irrigation can be competitive, i.e. measures that reduce deep percolation can increase surface runoff and vise versa. Some measures commonly recommended include the following:

Increasing check flow rate: This commonly recommended measure reduces the advance time to the end of the field, thus decreasing variability in infiltration times along the field length. However, caution should be exercised with this approach such that the increased flow rate does not increase soil erosion.

Reducing field length: This is the most effective measure for improving uniformity and for reducing percolation rate below the root zone. Studies have shown that shortening the field length by one-half can reduce percolation by at least 50 percent. The distribution uniformity (DU) of infiltrated water will be increased by 10 to 15 percentage points compared with the normal field length. The new advance time to the end of the shortened field generally will be 30 to 40 percent of the advance time to the end of the original field length. Thus, the irrigation set time must be reduced to account for the new set time. A major problem with the above measure is the potential for increased surface runoff, which could be 2 to 4 times more runoff for the reduced length compared with the original field length (Hanson, 1989).

Selecting an appropriate irrigation water cutoff time: The amount of surface runoff or tailwater can be greatly reduced by decreasing the cutoff time of the irrigation water. This is the most effective measure for reducing surface runoff. The cutoff time for a given field may need to be determined on a trial-and-error basis. The cutoff time should occur before the water reaches the end of the field except for sandy soils with high infiltration rates. However, the cutoff time should allow sufficient water to infiltrate the end of the field. Some guidelines, however, are to cut off the irrigation water when the water advance is about 60% of the field length for fine-textured soil, 70% to 80% for medium texture soil, and near 100% for coarse textured soil.

Recover surface runoff: Recirculation systems (commonly called tailwater-return systems), or storage-reuse systems, can dramatically improve efficiency of flood irrigation systems. Recirculation systems involve collecting the surface runoff in a small reservoir at the lower end of the field and then recirculation the water back to the “head” of the field during irrigation, using a low lift pump and a buried or portable pipeline. The recirculated water should be used to irrigate an additional area of the field. Simply recirculating the runoff back to the same irrigation set that generated the runoff results only in temporarily storing the water on the field and will result in an increased rate of runoff.

Similarly, a storage/reuse system involves storing all of the surface runoff from a field and then using that water to irrigate another field at the appropriate time. This approach requires a farm with multiple fields, a relatively large reservoir, and distribution systems to convey surface runoff to the storage reservoir and to convey the stored water to the desired fields.

Care should be taken that water quality is not degraded from the storage-reuse systems. Pesticides have been found to infiltrate groundwater on some soil types, primarily from catchment basins, steps to seal basins from subsurface infiltration may be effective at preventing contamination.

Source: Irrigated Alfalfa Management for Mediterranean and Desert Zone. 2008. UCANR. Publication 3512. Chapter 7. Irrigating Alfalfa in Arid Regions.

Efficacy of Selected Insecticide Against Cowpea Aphid and Other Aphids in Imperial Valley, CA Alfalfa in January, 2013

Eric T. Natwick and Martin I. Lopez

Spotted alfalfa Aphid (SAA) *Therioaphis maculate* (Buckton)
Blue alfalfa aphid (BAA), *Acyrthosiphon kondoi* Shinji
Pea aphid (PA), *Acyrosiphon pisum* (Harris)
Cowpea aphid (CPA) *Aphis craccivora* Koch

Cowpea aphid (CPA) is an annual pest of alfalfa in Imperial Valley, CA usually showing up on late-October or November and persisting as the dominate species in alfalfa crops through December and January. The CPA population is often brought under control by the sevenspotted lady beetle *Coccinella septempunctata* or by the common aphid parasites, *Lysiphlebus* sp. and *Diaraetiella* sp., but if the population builds up in the absence of lady beetles and aphid parasites, insecticide treatments may be needed to prevent stunting and contamination by aphid honeydew and sooty mold growth on the honeydew. Both honeydew and sooty mold growth will down grade the quality of the hay resulting in a lower price for the hay. At the time of release of this publication, the insecticides Sivanto 200SL, Transform WG, Beleaf 50 SG, Centric 40 WG and Endigo ZC were not yet registered for use on alfalfa grown for hay or pasture and their use would be in violation of federal and California laws regulating pesticides.

The objective of the study was to evaluate the efficacy of registered and new insecticidal compounds for use against CPA and other aphids (SAA, PA and BAA) on alfalfa grown for hay production, under low desert growing conditions during the spring. A field study was conducted during the spring of 2013 at the UC Desert Research and Extension Center. A stand of alfalfa, VAR. CUF 101, was used for the experiment. The experimental design was RCB using four replicates, with twelve insecticide treatments and an untreated check. Plots measured 13.3 ft by 50 ft. Insecticide treatments are listed in the tables. The foliar insecticide spray treatments were applied on 17 Jan 2013. Broadcast spray applications were made with a Lee Spider Spray Trac, tractor mounted spray boom, operated at 30 psi, delivering 53 gpa through 12 nozzles (TJ-60 11003VS) with a 13.3 ft spray swath. An adjuvant, RNA Activator 85 (Manufactured by: RNA, PO Box 210, San Joaquin, CA 93660), was applied at 0.25% vol/vol in tank mixtures with each insecticide treatment. CPA and other aphids were counted on ten randomly extracted alfalfa stems from each plot on 16 Jan pre-treatment (PT) and on 22, 25, 28 and 31 Jan; 5 after treatment (DAT), 5DAT, 8DAT, 11DAT, 14DAT, respectively. Data sets were analyzed using a 2-way ANOVA and means separated by Fisher protected LSD ($P \leq 0.05$).

There were no differences among the treatments for numbers of CPA, PA, BAA, or SAA for the 1DPT samples (Table 1-4). All insecticide treatments had fewer BAA than the check 8DAT, 11DAT, 14DAT and for the PTA, but not for the 5DAT sample when there were no differences among the treatment means (Table 3). All insecticide treatments had fewer CPA, PA and SAA than the check 5DAT, 8DAT, 11DAT, 14DAT and for the PTA (Tables 1-4). None of the insecticide treatments showed any injury to the alfalfa plants. This research was supported by industry gifts.

Table 1.

		CPA per sweep					
Treatment	oz/acre	1DPT[w]	5DAA[x]	8DAA	11DAA[y]	14DAA[y]	PTA[yz]
Check	--------	34.38 a	60.68 a	48.88 a	74.15 a	81.83 a	66.38 a
Sivanto 200SL	10.5 fl	52.90 a	19.48 bc	10.58 c-e	4.60 d-f	10.75 cd	11.35 cd
Transform WG	1.5 dry	41.98 a	8.80 cd	18.53 b	14.10 bc	24.83 bc	16.56 bc
Dimethoate 2.67EC	16 fl	43.40 a	3.65 d	6.63 de	4.33 cd	4.40 de	4.75 fg
Malathion 8	16 fl	59.53 a	9.63 cd	3.65 de	2.55 d-f	6.00 cd	5.46 fg
Beleaf 50 SG	2.24 dry	39.08 a	17.35 b-d	17.05 bc	28.10 b	31.95 ab	23.61 b
Mustang	4.3 fl	36.95 a	14.60 b-d	6.85 de	4.63 c-e	4.50 d-f	7.64 d-g
Stallion	11.75 fl	49.50 a	28.00 b	6.38 de	1.58 ef	1.05 ef	9.25 d-f
Lorsban Advanced	32 fl	47.05 a	23.25 bc	9.53 c-e	1.88 d-f	0.90 f	8.89 de
Cobalt 2.54 EC	24 fl	38.43 a	11.90 cd	3.53 e	2.00 d-f	0.58 ef	4.50 g
Centric 40 WG	3.5 dry	43.40 a	11.63 cd	10.50 c-e	4.55 c-f	3.15 d-f	7.46 d-g
Warrior II CS	1.92 fl	49.25 a	11.00 cd	7.48 de	1.88 c-f	2.73 d-f	5.77 e-g
Endigo ZC	4.0 fl	43.43 a	23.30 bc	11.48 b-d	1.25 f	1.33 ef	9.34 c-d

Means within columns followed by the same letter are not significantly different, LSD; *P*= 0.05.

[w] Days pre-treatment on 16 January 2013

[x] Days after application.

[y] Log_{10} transformed data used for analysis but actual meats are reported.

[z] PTA is post treatment average.

Table 2.

Treatment	oz/acre	PA per sweep					
		1DPT[w]	5DAA[x]	8DAA	11DAA[y]	14DAA[y]	PTA[yz]
Check	--------	0.33 a	1.33 a	1.33 a	12.88 a	13.83 a	7.34 a
Sivanto 200SL	10.5 fl	0.76 a	0.65 ab	0.05 de	0.38 b-d	1.75 b	0.71 b-d
Transform WG	1.5 dry	0.73 a	0.20 bc	0.30 bc	2.10 bc	4.88 b	1.87 bd
Dimethoate 2.67EC	16 fl	0.50 a	0.45 a-c	0.08 c-e	0.53 b-d	1.85 b	0.73 b-f
Malathion 8	16 fl	0.50 a	0.35 bc	0.23 b-d	0.65 bc	1.03 b	0.56 b-e
Beleaf 50 SG	2.24 dry	0.18 a	0.13 bc	0.50 b	1.25 b	4.03 b	1.48 b
Mustang	4.3 fl	1.05 a	0.18 bc	0.18 b-d	0.40 b-d	0.65 b	0.35 c-f
Stallion	11.75 fl	1.18 a	0.60 ab	0.10 b-e	0.08 d	0.28 b	0.26 c-f
Lorsban Advanced	32 fl	0.78 a	0.25 bc	0.00 e	0.25 cd	0.13 b	0.16 ef
Cobalt 2.54 EC	24 fl	0.23 a	0.10 bc	0.05 de	0.10 d	0.15 b	0.10 f
Centric 40 WG	3.5 dry	0.60 a	0.03 c	0.00 e	0.20 cd	0.28 b	0.13 ef
Warrior II CS	1.92 fl	0.60 a	0.10 bc	0.03 de	0.38 cd	0.45 b	0.28 d-e
Endigo ZC	4.0 fl	0.18 a	0.33 bc	0.05 c-e	0.08 d	0.13 b	0.14 ef

Means within columns followed by the same letter are not significantly different, LSD; *P*= 0.05.

[w] Days pre-treatment on 16 January 2013

[x] Days after application.

[y] Log_{10} transformed data used for analysis but actual meats are reported.

[z] PTA is post treatment average.

Table 3.

Treatment	oz/acre	BAA per sweep					
		1DPT[w]	5DAA[x]	8DAA	11DAA[y]	14DAA[y]	PTA[yz]
Check	--------	0.40 a	0.50 a	1.98 a	11.65 a	14.38 a	7.13 a
Sivanto 200SL	10.5 fl	3.90 a	0.08 a	0.20 c	0.43 cd	0.63 b-d	0.33 b-e
Transform WG	1.5 dry	1.73 a	0.05 a	0.68 b	4.30 bc	1.03 b	1.51 b
Dimethoate 2.67EC	16 fl	7.73 a	0.05 a	0.08 c-e	0.98 b-d	0.43 b-d	0.38 b-e
Malathion 8	16 fl	1.20 a	0.05 a	0.25 cd	0.58 b-d	2.45 bc	0.83 b-d
Beleaf 50 SG	2.24 dry	0.00 a	0.13 a	0.23 cd	1.68 b	0.70 bc	0.68 bc
Mustang	4.3 fl	0.65 a	0.03 a	0.03 de	0.30 d	0.13 cd	0.12 de
Stallion	11.75 fl	3.18 a	0.18 a	0.00 e	0.48 cd	0.15 cd	0.20 de
Lorsban Advanced	32 fl	1.43 a	0.10 a	0.10 c-e	0.18 d	0.15 cd	0.13 de
Cobalt 2.54 EC	24 fl	1.45 a	0.18 a	0.03 de	0.10 d	0.00 d	0.08 e
Centric 40 WG	3.5 dry	0.38 a	0.00 a	0.08 c-e	0.18 d	0.08 cd	0.08 de
Warrior II CS	1.92 fl	0.75 a	0.03 a	0.10 c-e	0.08 d	0.83 bc	0.23 c-e
Endigo ZC	4.0 fl	0.05 a	0.13 a	0.13 c-e	0.08 d	0.05 cd	0.09 de

Means within columns followed by the same letter are not significantly different, LSD; *P*= 0.05.

[w] Days pre-treatment on 16 January 2013

[x] Days after application.

[y] Log_{10} transformed data used for analysis but actual meats are reported.

[z] PTA is post treatment average.

Table 4.

Treatment	oz/acre	SAA per sweep					
		1DPT[w]	5DAA[x]	8DAA	11DAA[y]	14DAA[y]	PTA[yz]
Check	--------	5.43 a	6.03 a	13.65 a	12.50 a	20.83 a	13.25 a
Sivanto 200SL	10.5 fl	2.03 a	1.38 a-c	0.95 c	0.10 cd	0.73 b-d	0.79 cd
Transform WG	1.5 dry	1.98 a	0.65 c-e	0.68 c	0.30 c	1.05 bc	0.67 c-f
Dimethoate 2.67EC	16 fl	2.10 a	0.03 f	0.05 c	0.18 cd	0.08 d	0.08 gh
Malathion 8	16 fl	6.93 a	2.03 b-d	2.10 bc	2.08 b	3.55 b	2.44 bc
Beleaf 50 SG	2.24 dry	4.98 a	3.33 ab	3.43 b	2.35 b	1.33 bc	2.61 b
Mustang	4.3 fl	1.93 a	1.35 b-d	0.88 c	0.20 cd	0.78 cd	0.80 c-e
Stallion	11.75 fl	2.13 a	0.35 c-f	0.10 c	0.15 cd	0.28 cd	0.22 e-h
Lorsban Advanced	32 fl	3.45 a	0.35 c-f	0.05 c	0.03 cd	0.03 d	0.11 gh
Cobalt 2.54 EC	24 fl	2.20 a	0.50 ef	0.00 c	0.03 cd	0.00 d	0.02 h
Centric 40 WG	3.5 dry	4.20 a	1.15 b-d	0.43 c	0.05 cd	0.50 b-d	0.53 d-g
Warrior II CS	1.92 fl	12.05 a	0.53 c-f	0.15 c	0.30 cd	0.05 d	0.19 f-h
Endigo ZC	4.0 fl	2.58 a	0.23 d-f	0.13 c	0.00 d	0.03 d	0.90 gh

Means within columns followed by the same letter are not significantly different, LSD; *P*= 0.05.

[w] Days pre-treatment on 16 January 2013

[x] Days after application.

[y] Log_{10} transformed data used for analysis but actual meats are reported.

[z] PTA is post treatment average.

AGRITOURISM INTENSIVE:

A class for Riverside region farmers and ranchers

offered by UC Cooperative Extension Riverside County, the UC Small Farm Program, Riverside County Farm Bureau, and other local partners




Are you considering agritourism or nature tourism on your farm or ranch? Would you like to build your agritourism or nature tourism business?

This class is for you!

- Local agritourism operators will share their own experiences and will be part of a supportive network of advisors as class participants plan and start new enterprises.
- Participants will learn from experts in business planning, regulatory compliance, risk management, hospitality and cost-effective marketing, including social media.
- The hands-on, interactive activities will guide participants as they assess their own farms or ranches for agritourism potential and start their own business, risk management and marketing plans.
- Each participant will receive a free copy of the extensive handbook, "Agritourism and Nature Tourism in California", which will be used as a text for the class.

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Dates:	**Mondays, December 9, 2013, January 13, 2014 and February 10, 2014**
Times:	9:00 a.m. – 3:00 p.m. each session (lunch provided)
Location:	Western Municipal Water District, 14205 Meridian Parkway, Riverside, CA 92518
Cost:	$40 for 3-session course – Space is limited, please register early
Information:	Penny Leff, UC Small Farm Program, paleff@ucdavis.edu, 530-752-7779

This material is based upon work supported by USDA/NIFA under Award Number 2012-49200-20030.

United States Department of Agriculture

CIMIS REPORT AND UC DROUGHT

MANAGEMENT PUBLICATIONS

Khaled Bali and Sharon Sparks*

California Irrigation Management Information System (CIMIS) is a statewide network operated by California Department of Water Resources. Estimates of the daily reference evapotranspiration (ET_o) for the period of December 1 to February 28 for three locations in the Imperial County are presented in Table 1. ET of a particular crop can be estimated by multiplying ET_o by crop coefficients. For more information about ET and crop coefficients, contact the UC Imperial County Cooperative Extension Office (352-9474) or the IID, Irrigation Management Unit (339-9082). Please feel free to call us if you need additional weather information, or check the latest weather data on the worldwide web (http://wwwcimis.water.ca.gov/cimis/welcome.jsp).

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

Station	December		January		February	
	1-15	16-31	1-15	15-31	1-15	16-28
Calipatria	0.07	0.07	0.08	0.09	0.12	0.14
El Centro (Seeley)	0.06	0.06	0.08	0.09	0.12	0.14
Holtville (Meloland)	0.06	0.06	0.08	0.09	0.12	0.14

*Imperial Irrigation District.

Link to UC Drought Management Publications

http://ucmanagedrought.ucdavis.edu/