Imperial County Agricultural Briefs

Features — From your Farm Advisors

September, 2011

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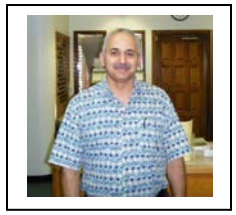
Sample of Fertilizers Used on Major Field Crops in the Imperial Valley



Khaled M. Bali

The amount of fertilizer needed by crops depends on several factors. Most crops require macro (N-P-K) and micro nutrients for optimum production. Table 1. Shows samples of fertilizers commonly used on field crops in the Imperial Valley. Other sources of fertilizers that are applied but not included in the table include organic fertilizers, manure, micro nutrients, and other fertilizers mixed with soil amendment products. Colorado River water contains potassium (K) and other nutrients. The table lists the amount based on standard practices over the last 30 years. The amount of fertilizer needed by a crop depends on several factors such as yield, soil chemical and physical properties, irrigation system, sources of irrigation water, crop type and other factors. For example alfalfa in the Imperial Valley requires frequent application of P (Phosphorus) but hardly any N (nitrogen, fixed from the air). Seventeen elements in varying amount are needed for alfalfa production in the Valley but commonly only P is applied. Carbon, hydrogen, and oxygen come from water and from CO_2 in the air. The other nutrients such as potassium, sulfur, molybdenum, and boron are either found in soil or in irrigation water.

The exact amount and type of fertilizer that needs to be applied could be determined by evaluating the nutritional status of the crop from visual observations, soil testing, or plant tissue testing or a combination of the above mentioned methods for optimal results. Most of the other field crops in the Valley require nitrogen and phosphorus in varying amount. Most of the other nutrients are obtained from soil or irrigation water.

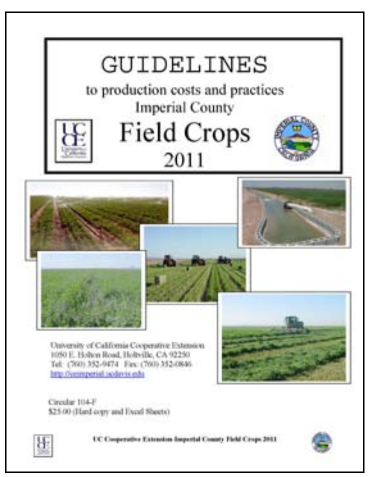
Table 1. Samples of fertilizers commonly used on major field crops in the Imperial County*

Crop	Fertilizer	Amount (lb/ac or gal/ac)	Estimated Fertilizer cost**	Application type	$ Cost /lb or /gal.	Avg. acres 2001-2010	2010 acres
Alfalfa- flat	11-52-0 P_2O_5	300 lb 100 lb	$76.00 $55.00	Land preparation Annual application	0.25 0.55	143,970 (all alfalfa)	136,815 (all alfalfa)
Alfalfa-bed	11-52-0 10-34-0	300 lb 25 gal	$76.00 $63.00	Land preparation Annual application	0.25 2.52	143,970 (all alfalfa)	136,815 (all alfalfa)
Bermudagrass	11-52-0 N (Urea) N Anhydrous	200 lb 400 lb 100 lb	$51.00 $204.00 $46.00	Land preparation Annual application Annual application	0.25 0.51 0.46	52,587	48,726
Bermudagrass Seed	11-52-0 11-52-0 N (Urea)	200 lb 150 lb 100 lb	$51.00 $38.00 $51.00	Land preparation Annual	0.25 0.25 0.51	24,930	19,485

	N (UAN32)	150 lb	$72.00	application Annual application Annual application	0.48		
Cotton	11-52-0 N Anhydrous N (UAN32) N Anhydrous	200 lb 100 lb 100 lb 60 lb	$51.00 $46.00 $48.00 $27.00	Land preparation Land preparation Growing period Growing period	0.25 0.46 0.48 0.46	7,994	4,563
Kleingrass	11-52-0 N (Urea) N Anhydrous	200 lb 300 lb 200 lb	$51.00 $153.00 $91.00	Land preparation Annual application Annual application	0.25 0.51 0.46	13,679	12,528
Sudangrass	N Anhydrous N (UAN32)	100 lb 120 lb	$46.00 $58.00	Land preparation Growing period	0.46 0.48	55,033	59,403
Sugar Beet	11-52-0 N (am- nitrate)	250 lb 160 lb	$64.00 $114.00	Land preparation Growing period	0.25 0.71	24,923	25,188
Wheat Flood irrigated	N (Urea) N (UAN32)	120 lb 240 lb	$61.00 $115.00	Land preparation Growing period	0.51 0.48	60,860 (all wheat)	58,562
Wheat Mulch planted	N (Urea) N (UAN32)	120 lb 240 lb	$61.00 $115.00	Land preparation Growing period	0.51 0.48	60,860 (all wheat)	58,562

* Source: Guidelines to Production Costs and Practices-Imperial County Field Crops. 2011 Circular 104-F. UC Cooperative Extension-Imperial County.

**Cost estimates are based on a survey conducted between December 2010 and February 2011 and are not representative of current costs.


GUIDELINES
to production costs and practices
Imperial County
Field Crops
2011

INSECTICIDE EFFICACY AGAINST WHITEFLY IN BROCCOLI, 2010

Eric T. Natwick

The objective of the study was to evaluate the efficacy of insecticides for control of the sweetpotato whitefly, *Bemisia tabaci* Biotype B, on broccoli under desert growing conditions. Broccoli (Castle Dome) was direct seeded on 3 Sep 2010 at the University of California Desert Research and Extension Center, El Centro, CA into double row beds on 40 inch centers. Stand establishment was achieved using overhead sprinkler irrigation, and irrigated via furrow irrigation thereafter. Plots were four beds 13.3 ft wide by 50 ft long and bordered by one untreated bed. Four replications of each treatment were arranged in a RCB design. Insecticidal compounds, formulations and application rates along with treatment dates are provided the tables. The in-furrow at-planting application of Scorpion 35 SL was injected 2 inches below the seed in 15.6 gpa H_2O on 2 Sep 2010. All other insecticide treatments were foliar sprays applied with a Lee Spider Spray TracTractor 4-row sprayer with three TJ-60 11003VS nozzles per row that delivered a directed spray application at 30 psi and 52.9 gpa on the dates indicated in Table 1. An adjuvant, Dyne-Amic (Helena Chemical Co.) was added at 0.25% to each foliar spray mixture. Numbers of SWF nymphs were counted within a leaf disk of 1.65 cm^2 on a basal leaf from 10 plants per plot in each replicate and data were recorded on the dates listed in Table 2. Plant height was measured in cm on 26 October 2010. Data were analyzed using ANOVA. Differences among means on each sampling date and in each experiment were determined using Least Significant Difference Test (LSD); P=0.05.

The SWF population level was high during this trial, but at the expected level for September planted broccoli in Imperial Valley, CA. None of the treatments had significantly (P=0.05) fewer SWF nymphs than the check until 18 Oct when all insecticide treatments except NNI-0101 at 1.6 fl oz/acre and Scorpion 35 SL at 7.0 fl oz/acre had fewer adults compared to the check (Table 2). All of the insecticide treatments had fewer SWF nymphs compared to the check on 25 Oct. Only the Scorpion 35 SL treatment injected 2 inches below the seed at planting, the NNI-0101 treatment at 2.4 fl oz/acre and the Assail 30 SG treatment at 4.0 dry oz/acre had plant growth greater than the check. NNI-0101 20 SC (Pyrifluqinazon) is an experimental insecticide under development by Nichino Americas and not registered for this use at the time of publication.

Table 1. Insecticide Treatment List for Whitefly Control on Broccoli in 2010

Treatment	oz/acre	Application method	Application date
NNI-0101	1.6	Foliar spray	21 Sep, 5, 21 Oct
NNI-0101	2.4	Foliar spray	21 Sep, 5, 21 Oct
NNI-0101	3.2	Foliar spray	21 Sep, 5, 21 Oct
Assail 30 SG	4.0	Foliar spray	21 Sep, 5, 21 Oct
Movento	5.0	Foliar spray	21 Sep, 5, 21 Oct
Scorpion 35 SL	7.0	Foliar spray	21 Sep, 5, 21 Oct
Scorpion 35 SL	10.5	In-furrow injection	2 Sep
Check	--------	--------------------	--------------------

Table 2. Numbers of Whitefly Nymphs per cm^2 of leaf and Broccoli Plant Height Following Insecticide Treatments in 2010

			SWF nymphs per cm^2			Plant Height in cm
Treatment	oz/acre	20 Sep	27 Sep	18 Oct	25 Oct	26 Oct
NNI-0101	1.6	0.29	12.14	18.4 ab	11.99 bc	9.60 bc
NNI-0101	2.4	0.41	9.62	11.55 bc	18.53 b	10.53 b
NNI-0101	3.2	0.55	6.41	12.67 bc	14.79 bc	8.90 bc
Assail 30 SG	4.0	0.98	5.26	8.27 c	16.74 b	10.98 b
Movento	5.0	0.59	8.97	7.67 bc	5.61 c	9.48 bc
Scorpion 35 SL	7.0	0.58	10.15	17.21 abc	6.65 c	10.13 bc
Scorpion 35 SL	10.5	0.98	10.14	14.26 bc	19.86 b	14.43 a
Check	--------	0.39	12.56	24.68 a	29.61 a	8.15 c

Means within columns followed by the same letter are not significantly different, ANOVA; LSD ($P<0.05$).

An Injected Insecticide versus Foliar Insecticides for Lettuce Worm Control in 2010

Eric T. Natwick

The objective of the study was to evaluate the efficacy of various formulations of chlorantraniliprole (Durivo 2.5 SC as an in-furrow soil injection, Voliam Flexi 40 WG as a foliar spray, and Voliam Xpress 1.25 ZC as a foliar sprays, compared to a standard foliar spray worm control insecticide spinetoram (Radiant) and a non-treated check for early season worm pests on iceberg head lettuce under desert growing conditions. Head lettuce (KEEPER) was direct seeded on 3 Sep 2010 at the University of California Desert Research and Extension Center, El Centro, CA into double row beds on 40 inch centers. Stand establishment was achieved using overhead sprinkler irrigation, and irrigated with furrow irrigation thereafter. Plots were four beds 13.3 ft wide by 40 ft long and bordered by one untreated bed. Five replications of each treatment were arranged in a RCB design. Insecticidal compounds, formulations and application rates along with treatment dates are provided in Table 1. The in-furrow, at-planting application of Durivo was injected 2 inches below the seed in 15.6 gpa of H_2O on 2 Sep 2010. All other insecticide treatments were foliar sprays applied with a Lee Spider Spray TracTractor 4-row sprayer with three TJ-60 11003VS nozzles per row that delivered a broadcast application at 30 psi and 52.8 gpa on the dates indicated in Table 1. An adjuvant, Dyne-Amic (Helena Chemical Co.) was added to each foliar spray mixture at 0.25% vol/vol. Numbers of BAW and CL from 10 plants per plot in each replicate were recorded on each sample date as indicated in Table 2 and 3. Lettuce plant growth measurement of height in cm and diameter in cm were recorded for 5 plants at random in each plot on 27 Oct, Table 4. Data were analyzed using ANOVA. Differences among means on each sampling date and in each experiment were determined using Least Significant Difference Test (P=0.05).

BAW and CL population levels were low during this trial. There were no differences among the treatments on sampling dates 20 Sep and 27 Sep because there were very few BAW larvae and CL larvae present (Table 2 and 3). All of the insecticide treatments significantly (P=0.05) reduced numbers of BAW larvae and CL larvae compared to the untreated check on the 4 Oct and 18 Oct sampling dates. There were no differences among the insecticide treatments either as soil injection of chlorantraniliprole or foliar spray formulations of the same as compared to the standard Radiant foliar spray for worm control. Lettuce plants sampled in all insecticide treated plots were significantly taller than the check plants (Table 4). There were no differences in plant diameter from the check and any of the plants sampled from the insecticide treated plots. No phytotoxicity symptoms were observed following any of the insecticide treatments.

Table 1. Insecticide Treatment List for Worm Pest Control in Lettuce in 2010

Treatment	Oz/acre	Application method	Treatment date
Untreated Check	--------	No application	--------------------
Durivo 2.5 SC	13.0	In-furrow injection	2 Sep
Voliam Flexi 40 WG	7.0	Foliar spray	21 Sep, 5 Oct
Voliam Xpress 1.25 ZC	9.0	Foliar spray	21 Sep, 5 Oct
Radiant	5.0	Foliar spray	21 Sep, 5 Oct

Table 2. Numbers of Beet Armyworm Larvae on Lettuce Following Various Insecticide Treatments in 2010

		BAW per ten plants				
Treatments	oz/acre	20 Sep	27 Sep	4 Oct	18 Oct	Average
Check	------	0.00	0.00	1.00 a	3.80 a	1.20 a
Durivo 2.5 SC	13.0	0.00	0.00	0.00 b	0.00 b	0.00 b
Voliam Flexi 40 WG	7.0	0.00	0.00	0.00 b	0.00 b	0.00 b
Voliam Xpress 1.25 ZC	9.0	1.20	0.00	0.00 b	0.00 b	0.30 b
Radiant	5.0	0.00	0.00	0.00 b	0.00 b	0.00 b

Means within columns followed by the same letter are not significantly different, LSD (P<0.05).

Table 3. Numbers of Cabbage Looper Larvae on lettuce Following Various Insecticide Treatments in 2010

		CL per ten plants				
Treatments	oz/acre	20 Sep	27 Sep	4 Oct	18 Oct	Average
Check	------	0.00	0.00	0.80 a	1.20	0.50 a
Durivo 2.5 SC	13.0	0.00	0.00	0.00 b	0.00 b	0.00 b
Voliam Flexi 40 WG	7.0	0.00	0.00	0.00 b	0.00 b	0.00 b
Voliam Xpress 1.25 ZC	9.0	0.00	0.00	0.00 b	0.00 b	0.00 b
Radiant	5.0	0.00	0.00	0.00 b	0.00 b	0.00 b

Means within columns followed by the same letter are not significantly different, LSD (P<0.05).

Table 4. Lettuce Size Difference Following Insecticide Treatments in 2010

		Plant growth measurements on 27 Oct, in cm	
Treatments	oz/acre	Height	Diameter
Check	------	11.80 b	20.48 b
Durivo 2.5 SC	13.0	14.40 a	24.04 a
Voliam Flexi 40 WG	7.0	13.68 a	23.96 a
Voliam Xpress 1.25 ZC	9.0	13.64 a	23.60 a
Radiant	5.0	13.76 a	22.40 ab

Means within columns followed by the same letter are not significantly different, LSD (P<0.05).

CIMIS REPORT AND UC DROUGHT MANAGEMENT PUBLICATIONS

Khaled Bali and Steve Burch*

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 September 1 to November 30 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	September		October		November	
	1-15	16-30	1-15	15-31	1-15	16-30
Calipatria	0.30	0.27	0.23	0.19	0.14	0.10
El Centro (Seeley)	0.29	0.26	0.23	0.17	0.13	0.09
Holtville (Meloland)	0.30	0.27	0.22	0.18	0.13	0.10

* Ag Water Science Unit, Imperial Irrigation District.

Link to UC Drought Management Publications

http://ucmanagedrought.ucdavis.edu/