Imperial AGRICULTURAL BRIEFS

***January** 2005*

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Winter SugarBeet Fertilization

Herman Meister

The use of "sugarbeet nitrate petiole tests" for measuring the nitrogen levels present in sugarbeet plants is an easy method to monitor nitrogen utilization by the crop during the growing season.

The petiole tests indicate how much nitrate nitrogen is in the plant. Low-test results (<1200 ppm) may be obtained during the colder times of the year, especially in January and February. Does this mean that additional N should be applied for a May or June harvest? Perhaps, or perhaps not, depending on several factors such as soil type, soil temperature, total amount of N applied, and number of irrigations.

Petiole samples for nitrate N in lighter soils may have a much steeper decline due to leaching and may require additional applications of N to reach harvest. Heavier soil types (clays, silty clays, and clay loams) have the capacity to retain more N and resist leaching.

If the petiole nitrate results are low and the total N for the crop has been applied, and soil temperatures have been in the range of 50–55^0 F in a clay soil, a soil test to determine the N available may be appropriate. If soil tests indicate an adequate amount of N is present to finish the crop, then additional applications are not necessary.

Temporary low levels of nitrate N during January and February may be due to plant growth rates that are faster than the rate at which roots can take up and supply N under low soil temperatures. Adding a soluble source of nitrate N may raise the levels of nitrate N, but this additional N could be a major problem at harvest with high brei concentrates. Over fertilization with N can increase the cost of production and affect the beet quality.

Comparison of Fungicides for Control of Powdery Mildew on Muskmelon, 2004.

Thomas Turini, Michael Coffey (UC Riverside) and Jose Aguiar (UCCE, Coachella)

The study was conducted at the University of California Desert Research and Extension Center. On 1 April, 'Golden Beauty' casaba melons seed were sown on a Meloland clay loam and drip irrigated to harvest. Treatments are listed in the table. Each plot consisted of one 80-inch bed 25 feet long. Treated beds were separated by one untreated planted row and by 10 feet between plots within a row. The experimental design was a randomized complete block with five replications. On 28 May, 6 and 16 June, materials were applied in 30 gallons of water per acre with a CO_2 pressurized backpack sprayer at 30 psi. A spray boom with four Teejet 8002 flat fan nozzles spaced 20-inches apart was used for all applications. On 26 June, powdery mildew severity was rated on upper and lower leaf surfaces on a scale of 0 to 5 based on percentage of leaf surface covered with the fungus. A leaf receiving a rating of "0" has no powdery mildew and a leaf rated 5 would be completely covered with the fungus. Arcsine transformed data was subjected to analysis of variance. Student-Newman-Keul's Multiple Range Test on transformed data (P 0.05) was use for mean separation. Non-transformed means are presented as a percentage of the leaf surface covered by the pathogen.

Plants treated with Procure 480SC, at both rates, had the lowest disease severity ratings on the underside of the leaf surface. Quintec at both rates tested, Procure 50WS at both rates tested, Pristine with Latron B1956, dusting sulfur, Rally 40W with Latron B1956, a dusting sulfur/Procure 50WS/Topsin M70W rotation, Endura with Latron B1956, MicroCide, V-10188 at both rates tested, a dusting sulfur/Rally 40W with Latron B1956/Flint rotation, a Procure 50W/Flint rotation, a Flint/Bravo Weather Stick, and Flint were not different from the Procure 480SC treatments.

The treatments that were among those with the lowest disease severity on the lower leaf surface were also among the best performing materials on the upper leaf surface. Although, on the upper leaf surface, the Bravo Weather Stick/Flint rotation was similar to the best performing materials. No phytotoxicity was observed , however plants treated with the Microcide (fish oil with humic acid) had a black residue on leaves and exposed fruit.

Treatments	28 June			
	Upper leaf surface		Lower leaf surface	
Procure 480SC 8 fl oz……...	0.0	f	1.6	h
Procure 480SC 6 fl oz……...	1.2	ef	2.0	h
Quintec 12.0 fl oz……..	1.6	def	4.0	gh
Procure 50WS 8 oz……...	1.6	cdef	4.0	fgh
Procure 50WS 6 oz……...	4.8	cdef	6.0	efgh
Pristine 18.5 oz + Latron B1956 0.06 %.....	4.8	cdef	6.0	defgh
Dusting Sulfur 30 lbs……	2.0	cdef	6.8	cdefgh
Quintec 6.0 fl oz……	3.2	cdef	6.8	efgh
Rally 40W 4.0 oz + Latron B1956 0.06 % [x].....	2.0	cdef	8.0	cdefgh
Dusting S 30lbs (1) /Procure 50WS 8oz (2,4) /Topsin M 70W 8oz (3)[w]...	4.0	cdef	8.4	bcdefgh
Endura 6.5 oz + Latron B1956 0.06%.....	4.0	cdef	9.6	bcdefgh
MicroCide as formulated……..	6.8	cdef	12.0	bcdefgh
V-10118 3.1 fl oz……..	5.6	cdef	12.0	bcdefgh
Dusting S 30 lbs (1)/Rally 40W 4.0 oz + Latron B1956 0.06 % (2,4)/ Flint 50WDG 2.08oz (3)	6.8	cdef	12.4	bcdefgh
V-10118 6.2 fl oz……..	7.6	cdef	13.2	bcdefgh
Procure 50WS 8.0oz (1,3) / Flint 50WDG 2.08oz (2,4)……	14.4	bcdef	14.0	bcdefgh
Flint 50WDG 2.08oz (1,3) /Bravo Weather Stick 3pts (2,4)…….	2.8	cdef	14.8	bcdefgh
Flint 50WDG 2.0 oz……..	10.0	cdef	14.8	bcdefgh
Bravo Weather Stick 3pts (1,3)/Flint 50WDG 2.08oz (2,4)……	2.0	cdef	20.8	bcdefg
Quadris 2.08F 15.4 fl oz + Latron B1956 0.06 %.....	15.2	bcde	22.0	bcdef
Cabrio 1.0 lb + Latron B1956 0.06 %.....	20.4	bc	26.4	bcde
Topsin M 4.5FL 10.0 fl oz……	18.8	bcd	28.0	bcd
Microthiol Special 80W 6 lbs……...	14.0	bcde	30.0	bc
Topsin M 70W 0.5 lbs……..	28.4	b	32.8	b
CONTROL……	48.0	a	52.0	a

[z] All materials were applied in the equivalent of 30 gallons of water per acre with a CO_2-pressurized backpack sprayer at 30 psi. [y] Arcsine transformed data was subjected to analysis of variance. Means followed by the same letter do not differ significantly as determined by Student-Newman-Keul's Multiple Range Test (P 0.05) on transformed data. Non-transformed means are presented.

[x] Materials separated with a "+" were tank mixed.

[w] Materials separated "/" were used in rotation. Numbers in () refer to application dates. 1=28 May, 2=7 June, 3=14 June and 4=25 June.

Neonicotinoid Insecticides and Their Potential Use in Cool Season Vegetable Crops

Eric T. Natwick

Neonicotinoid insecticides are systemic insecticides efficacious against whitefly, aphids and flea beetles. They alleviate many of the application problems associated with control of aphids and whiteflies. The target site for neonicotinoids is the nicotinic acetylcholine receptor in the insect nervous system; therefore, they are neurotoxins. Neonicotinoid insecticides are relatively safe for most beneficial insects, but may be harmful to some insects such as lady beetles. Most neonicotinoid insecticides have activity through soil application and as foliar sprays. Acetamiprid (Assail) has contact and systemic activity against many insects including excellent whitefly control and has some ovicidal activity applied as a foliar spray. Acetamiprid is not readily available to plants in the soil and therefore must be used as a foliar spray. Clothianidin (Belay & Clutch), Dinotefuron (Venom), Imidacloprid (Admire & Provado), Thiacloprid (Calypso), and Thiamethoxam (Actara & Platinum) are systemic as a foliar spray, soil or seed treatment and are also efficacious when applied through drip irrigation. Imidacloprid is relatively immobile in the soil and requires precise placement for root uptake to occur. Thiamethoxam, thiacloprid, dinotefuron and clothiadin move readily through the soil allowing side-dress applications to be pushed into the root zone with furrow irrigation. Performance of each compound varies with the crop and method of application.

Potential Uses of Neonicotinoid Insecticides in Lettuce and Cole Crops.

Active Ingredient	Trade Name	California Label*	Pre-Plant Soil Injection	Drip Irrigation	Side Dress	Foliar Spray
Acetamiprid	Assail	yes	no	no	no	yes
Clothiadin	Belay & Clutch	no no	yes no	yes no	yes no	no yes
Dinotefuron	Venom	no	yes	yes	yes	yes
Imidacloprid	Admire & Provado	yes yes	yes no	yes no	no no	no yes
Thiacloprid	Calypso	no	no	no	no	yes
Thiamethoxam	Actara & Platinum	no no	no yes	no yes	no yes	no yes

* Registration status in insecticides may change. The table includes the registration status for California at the time of publication and does not imply an endorsement or recommendation from the University of California. Always have a current label in hand before making a crop specific recommendation.

Durum Wheat Fertilization

Herman Meister

The minimum standards for durum quality acceptable to the grain trade is 13 % protein and 90 % HVAC (Hard Vitreous Amber Count). Durum below these standards can be blended with high quality grain if available, exported to foreign markets not interested in high quality pasta products, or sold as feed. Production of sub-standard durum is undesirable to the grower who is docked for not delivering a specified quality of grain according to the contract.

Quality Indicators

Grain protein and HVAC are convenient indicators of grain quality and can be measured rapidly by local grain companies. Yellow berry refers to a kernel with a starchy area encompassing a small portion of the kernel or the entire kernel. Yellow berry kernels are non-vitreous, and light does not pass through them. Vitreous kernels are literally glass-like in composition. The starchy areas in yellow berry are low in protein. Low HVAC count is related to low protein in a general way. Some varieties are more susceptible to yellow berry than other varieties even at similar grain protein levels. Also, a variety may form a yellow berry under certain environmental conditions, but not others despite equivalent grain protein content. Kernel protein is related to durum quality but other factors are also important such as color, milling characteristics, and the presence of gluten. The strength of gluten holds the pasta together and allows for thinner pasta products to be cooked quicker than thick-walled products.

Nitrogen

Yellow berry and low protein content are related to many factors such as high yields, irrigation, soil texture, previous crop, weather, and fertilizer practices. Nitrogen supply is the single most important factor in limiting grain protein. Durum wheat requires approximately 35 lbs. /A of actual nitrogen per 1000 lbs. of expected yield. Nitrogen is a component of amino acids, which are building blocks of proteins. Around 300 lbs. of N/A is needed to produce a 3.5-ton high-quality durum wheat crop. Research indicates that split applications of nitrogen are more efficient in producing optimum yields and quality than a single preplant application of the total amount for the crop. A suggested program would be 75-100 lbs. N pre-plant followed by 50 lbs. of N at tillering, jointing, boot,

and flowering. Late applications of nitrogen fertilizer during flowering have been shown to insure adequate protein levels, but not increase yields. Applications of nitrogen between flowering and 14 days later have been shown to increase protein content by about 1 %.

Over irrigation can leach nitrogen or make it unavailable due to lack of oxygen in the soil. Saturated soil conditions can lead of gaseous losses of nitrogen from the soil by the process of denitrification.

Coarse textured soils may produce low protein grain since they are likely to have a higher leaching potential resulting in lower nitrogen availability.

The previous crop can influence durum protein content due the effect on soil nitrogen availability. A legume crop like alfalfa increases soil nitrogen availability for the next crop. Vegetable crops are heavily fertilized and result in high levels of residual nitrogen. Crops such as small grains, corn, and sorghum can immobilize nitrogen during decomposition.

Phosphorus

The only other fertilizer element other than nitrogen that could be needed by wheat would be phosphorus. Fertilizing with phosphorus is not always required since most desert soils contain levels high enough for wheat production. The probability of a response from a phosphorus application is very low if soil test show 13-15 ppm of available phosphorous. If levels are in the 5-7 ppm range, then the addition of 50-100 lbs. of 11-52-0 should be adequate to produce the crop.

Frosted Sudangrass

Juan N. Guerrero

The other day as I was driving around the Imperial Valley, I saw something that caused me great despair; I saw a frosted field of sudangrass that had just been fenced with portable electric wire and apparently was about to be grazed. This is an accident about to happen!

Certain plants, such as sudangrass, under certain stressful growing conditions (such as frost), produce cyanide, which is lethal to livestock. In the rumen, the cyanide becomes hydrocyanic acid (HCN), commonly known as prussic acid. When a steer or lamb consumes enough HCN, it generally dies within 15 to 20 minutes without any apparent symptoms. The animal dies asphyxiated, the HCN preventing the oxygenation of blood. Often unseen, prior to death the animal has an increased respiration and pulse rate, nervousness, blue color in the mouth, muscle spasms, and finally gasps for air, unable to breathe.

What are the conditions that lead to HCN poisoning? One of the factors that results in HCN formation is N fertilization. Since all irrigated desert sudangrass is fertilized with N, the causative factors leading to HCN problems will always be present.

Sudangrass that is less than 18 to 24 inches tall is more prone to HCN problems. A rule of thumb to follow regarding the grazing of sorghums – wait until the plants are at least 36 inches tall before grazing. Cyanide formation is more of a problem in sudangrass during the earlier stages of (re)growth, concentrating in tillers and in upper leaves. For example, young, growing, dark green, 4 to 5 inch tall sudangrass often has 1000 ppm (or more) HCN.

As temperatures cool, remember that ***frosted*** sudangrass is ***extremely dangerous*** until it has completely dried out. In frozen sudangrass leaves, the HCN is released quickly. After a frost on sudangrass, livestock ***MUST BE REMOVED IMMEDIATELY,*** remember that ruminants can die within 15 to 20 minutes on sudangrass with more than 500 ppm of HCN. If freezing temperatures occur during the night and you have cattle or lambs on sudangrass, don't wait until the next morning to move them, pen them up **IMMEDIATELY** at night and then move them the next morning. After a frost, wait for 5 days to one week of frost-free weather before grazing the frosted sudangrass.

REMINDERS

The new Guidelines for 2004-2005 for both
Field Crops and Vegetable Crops
are now on line!
You are welcome to visit our website for the most up to date figures!
Printed copies or CD's are available in our office or
by mail.
http://ceimperial.ucdavis.edu

ANNOUNCEMENTS

California Weed Science Society
www.cwss.org

Register NOW for the 57th Annual Conference of The California Weed Science Society!
"Biotechnology and Weed Science"
January 10-12, 2005
Portola Plaza Hotel
Two Portola Plaza
Monterey, CA 93940

CIMIS REPORT

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 January 1 to March 31 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 (visit http://tmdl.ucdavis.edu and click on the CIMIS link).

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

Station	January		February		March	
	1-15	16-31	1-15	15-28	1-15	16-31
Calipatria	0.08	0.09	0.12	0.15	0.18	0.22
El Centro (Seeley)	0.08	0.09	0.12	0.14	0.16	0.20
Holtville (Meloland)	0.08	0.09	0.12	0.14	0.17	0.21

* Irrigation Management Unit, Imperial Irrigation District.

Eric T. Natwick, County Director