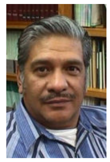
Imperial County Agricultural Briefs

Features

From your Farm Advisors

January, 2009

Supreme vs. Premium Hay



Juan N. Guerrero

In the irrigated Sonoran Desert, alfalfa hay production from March through June (1/3 of the year) represents about 60% of the annual hay yield and about 65% of the year's revenues. During the busy spring hay season, everything has to go right; irrigations, cutting schedules, and weed and insect control, to make a profit for the entire year.

The very highest quality grade of alfalfa is ***Supreme***. This type of hay has NO weeds, and must have <27% ADF. To have such a low ADF test, the hay has to be cut in the bud or pre-bud stage of growth. In the Imperial Valley, during spring, this means swathing at about 21 days after the last cutting. The next lower quality grade is ***Premium***, which has an ADF test of 27-29%. Premium hay may be cut at the 10% flower stage of growth; usually cut at about 28+ days from the last cutting. Supreme hay is higher priced than Premium hay, because it has a higher feeding value. However, cutting the field at 21 rather than 28 days means that hay yields will be reduced from 0.3 to 0.5 t/acre, and if hay is repeatedly cut at a 21 day cutting schedule, stand persistence will diminish.

Let us assume that for the April cutting I want to go after the big bucks and I want to bale Supreme quality hay. I normally bale about 1.8 t/acre of hay at the April cutting. Let us assume that I can sell Supreme hay for $235/t and Premium hay for $220/t. Is it profitable for me to make Supreme hay under these conditions? At the annual 2005 Alfalfa Symposium, Dan Putnam et al. of UD-Davis published a table (Table 1) that will help us out with this determination. We will assume that if I cut at 21 days, the yield reduction will be 0.4 t/acre.

Calculation:
(235 – 220) ÷ 220 = 6.8% difference
Looking at Table 1, under the 0.4 column and the 1.8 row, I must have a 28.6% increase in price to justify this scenario. Obviously, under the given conditions I will continue baling at a 28 day cutting schedule and continue making Premium hay.

Now let us assume all of the above, but Premium hay has decreased in price to $200/t.
Calculation:
(235 – 200) ÷ 200 = 17.5% difference

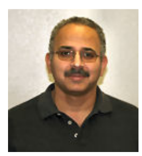
Again Table 1 tells me that $235 Supreme hay is not profitable for me. At $235 Supreme hay, Premium hay would have to drop to $183/t before the 21 day cutting schedule would even be considered. Sometimes the best, highest, greatest or most is not always the most profitable.

Table 1. Minimum percentage price improvement required to justify a yield decline due to cutting schedule on a per-cutting basis

Starting	reduction in yield (per cutting t/ac)									
Yield	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
t/acre	Minimum price improvement required, %									
0.4	33.3	100	300							
0.6	20.0	50.0	100	200	500					
0.8	14.3	33.3	60.0	100	166.7	300				
1	11.1	25.0	42.9	66.7	100	150	233			
1.2	9.1	20.0	33.3	50.0	71.4	100	140	200		
1.4	7.7	16.7	27.3	40.0	55.6	75.0	100	133	180	
1.6	6.7	14.3	23.1	33.3	45.5	60.0	77.8	100	128.6	166.7
1.8	5.9	12.5	20.0	28.6	38.5	50.0	63.6	80.0	100	125
2	5.3	11.1	17.6	25.0	33.3	42.9	53.8	66.7	81.8	100
2.2	4.8	10.0	15.8	22.2	29.4	37.5	46.7	57.1	69.2	83.3
2.4	4.3	9.1	14.3	20.0	26.3	33.3	41.2	50.0	60.0	71.4

Source: Putnam, D. H., S. Orloff and L. R. Teuber. 2005. Strategies for balancing quality and yield using cutting schedules and varieties. Proc. 35th California Alfalfa and Forage Symposium. Visalia, CA. Dec. 12-14. UC Coop. Ext. Davis.

IRRIGATION SCHEDULING - LOW VOLUME IRRIGATION SYSTEMS



Khaled M. Bali

There are several methods to determine when to irrigate and how much water you need to apply. Irrigation scheduling based on CIMIS (California Irrigation Management Information System) information is commonly used to predict the consumptive water use for most crops. Reference Evapotranspiration (real time ET_o or normal ET_o) and crop coefficients (K_c) are needed for irrigation scheduling. The consumptive water use for a particular crop can be estimated from:

$$ET_c=K_c*ET_o*W$$

where W= Correction for wetted volume (0.25-0.70)
W=0 : dry field (no crop)
W=1.0 : when the entire surface of the field is wet (surface irrigation).

To determine irrigation run time (RT) for a surface or subsurface irrigation systems, you need to know the average flow rate per 100 ft of drip tape and tape spacing. Flow rate is volume of water per unit time (gallons/hours, gph or gallons/minute, gpm). Daily run time can be calculated from the following equation:

$$RT= (C*ET_c*S)/(Q*DU)$$

where: RT= Daily run time in hours
C= Conversion factor = 1.0389
ET_c= Daily crop use in inches
S= Tape spacing in ft
Q= flow rate in gpm per 100 ft of tape
DU= Distribution Uniformity (0.85-0.95)

Most low volume irrigation systems are operated on regular intervals during the growing season. Irrigation frequencies vary from 1-4 days between irrigations. If you irrigate on a daily basis, you need to apply enough water to meet crop water use for one day. However, if you irrigate once every 3 days, you need to apply enough water to meet crop water needs for three days.

Conversion factors:
1 acre = 43560 ft^2
1 ft^3 = 7.48 gallons
1 gallon = 3.785 liters
1 cfs = 449 gpm
24 Hour-Run: 1 cfs ::: 2 Ac-ft per 24 hr.
12 Hour-Run: 1 cfs ::: 1 Ac-ft per 12 hr.

Spring Honeydew Melon Whitefly Insecticide Efficacy Trial

Eric T. Natwick

A stand of Honeydew melon was established at UC Desert Research & Extension Center in 19 March 2008. Thirteen insecticide treatments and an untreated control were replicated four times in a randomized complete design experiment. Insecticide treatments, rates as fluid ounces per acre and treatment dates are listed in Table 1. Sweetpotato whitefly biotype B adults were counted on the fifth leaf from cane tip on 10 plants at random in each plot via the leaf turn method and eggs and nymphs were counted on 1.65 cm leaf disks from ten crown leaves extracted from randomly selected melon plants in each plot on 30 April, prior to treatment, and then weekly from 1 May through 3 June. The averages for whitefly adults, eggs and nymphs for each treatment are shown in Tables 2.

All insecticide treatment had means for whitefly adult post-treatment averages that were significantly (≤ 0.05) lower than the mean for the untreated control (Table 2). The treatment with NNI-1010 20SC at 17 fluid ounces per acre had significantly fewer adults than Requiem at 96 fluid ounces per acre and Knack 0.86 EC at 9.84 fluid ounces per acre, but there were no other differences among the insecticide treatments. The mean for whitefly eggs for the untreated control was significantly greater than the means for all insecticide treatments except Requiem at 64 fluid ounces and 96 fluid ounces per acre and Knack 0.86 EC at 9.84 fluid ounces per acre. All insecticide treatments had significantly fewer whitefly nymphs than the untreated control. The treatment with Venom 20 SG at 14.32 fluid ounces per acre had significantly fewer nymphs than Requiem at 96 fluid ounces per acre and Knack 0.86 EC at 9.84 fluid ounces per acre, but there were no other differences among the insecticide treatments.

Table 1. Insecticides and Application Dates In Honeydew Melons, Holtville, CA, 2008.

Treatment	Oz/acre	Application date	Source	Active Ingredient
Untreated	---------	-------------------	--------------------	-----------------
Movento*	3.0	1, 15, 23 May	Bayer CropScience	Spirotetramat
Movento*	5.0	1, 15, 23 May	Bayer CropScience	Spirotetramat
Oberon 2SC	7.0	1, 15, 23 May	Bayer CropScience	Spiromesifen
Oberon 2SC	8.5	1, 15, 23 May	Bayer CropScience	Spiromesifen
Oberon 2SC f/b Requiem*	7.0 f/b 64.0	1 & 23 May 15 May	Bayer CropScience AgraQuest, Inc	Spiromesifen *Chenopodium ambrosioides* extracts
Requiem*	64.0	1, 15, 23 May	AgraQuest, Inc	*Chenopodium ambrosioides* extracts
Requiem*	96.0	1, 15, 23 May	AgraQuest, Inc	*Chenopodium ambrosioides* extracts
Venom 20 SG	14.32	1, 15, 23 May	Valent USA	Dinotefuran
Esteem 0.86 EC*	9.84	1, 15, 23 May	Valent USA	Pyriproxyfen
Knack 0.86 EC	9.84	1, 15, 23 May	Valent USA	Pyriproxyfen
NNI-1010 20SC*	3.2	1, 15, 23 May	Nichino America	Pyrifluqinazon
Hachi 15 EC*	27.0	1, 15, 23 May	Nichino America	Tolfenpyrad
Vetica SC*	17.0	1, 15, 23 May	Nichino America	Flubendiamide mixed with Buprofezin

A non-ionic surfactant @ 0.25 % (37.9 ml/4 gal) was added to all spray mixtures.
*Not registered for this use at time of publication.

Table 2. Post Treatment Averages for Sweetpotato whitefly biotype B Whitefly Adults per Melon Leaf, Eggs and Nymphs per cm^2, Holtville, CA, 2008.

Treatment	Oz/acre	Adults^z	Eggs	Nymphs
Untreated	---------	8.71 a	2.31 a	4.64 a
Movento	3.0	4.47 bc	1.27 d	2.23 cd
Movento	5.0	3.47 bc	1.32 cd	1.97 cd
Oberon 2SC	7.0	3.80 bc	1.65 bcd	2.45 bcd
Oberon 2SC	8.5	3.47 bc	1.19 d	2.14 cd
Oberon 2SC fb Requiem	7.0 fb 64.0	3.89 bc	1.21 d	2.08 cd
Requiem	64.0	4.47 bc	1.70 abcd	2.53 bcd
Requiem	96.0	4.57 b	1.99 ab	3.22 b
Venom 20 SG	14.32	3.80 bc	1.40 bcd	1.89 d
Esteem 0.86 EC	9.84	4.37 bc	1.59 bcd	2.62 bcd
Knack 0.86 EC	9.84	4.57 b	1.95 abc	2.81 bc
NNI-1010 20SC	3.2	2.95 c	1.57 bcd	2.37 bcd
Hachi 15 EC	27.0	4.37 bc	1.47 bcd	2.54 bcd
Vetica SC	17.0	3.55 bc	1.33 cd	2.49 bcd

^{z} Log transformed data used for analysis and reverse transformed means shown. Mean within Columns followed by the same letter are not significantly different via LSD; $P = 0.05$.

Foliar Fungal Diseases of Spinach Observed in Imperial County

Mark A. Trent

Spotting and blighting of foliage due to fungal diseases can result in loss of quality and marketability of leafy vegetable crops. To date, symptoms of anthracnose caused by *Colletotrichum dematium* and Cladosporium leaf spot caused by *Cladosporium variabile* have been observed in spinach fields in the Valley. Fortunately, both of these diseases are regarded as less devastating than downy mildew caused by *Peronospora farinosa* f. sp. *spinaciae*, a foliar disease that has been responsible for severe losses in spinach crops in the past. To our knowledge at the time of this publication downy mildew has not been reported in the Valley this season. However, wet and cool conditions are the recipe for downy mildew outbreaks.

In general, foliar diseases require extended periods of leaf wetness while suitable temperatures for the specific causal organism exist. For downy mildew, the optimum temperature is around 48 degrees F for spore germination and 54 to 60 degrees F for disease development. Considering that natural leaf wetness occurs during dew periods (early morning) or rain events when temperatures are cool and recent daytime temperatures have been in the upper 50's and low 60's, the stage is set for a possible downy mildew outbreak. Initial symptoms of downy mildew consist of bright yellow spots that form on cotyledons and leaves of all ages. With time, these spots can enlarge and become tan and dry. Close inspection of the underside of the leaf often reveals the purple growth of the organism (sporangia and sporangiospores). If disease development is extensive, leaves appear curled and distorted and may take on a blighted effect as a result of numerous infectio n sites.

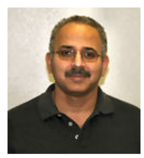
Downy mildew is clearly the most widespread and destructive spinach disease in California. The heavy canopy of densely planted spinach retains moisture and creates ideal conditions for infection and disease development. Spores (called sporangia) are dispersed in the air from plant to plant and field to field by winds and splashing water. *Peronospora farinosa* f. sp. *spinaciae* infects only spinach and a few Chenopodium weed species. The pathogen exists as distinct genetic races.

In the field the pathogen can grow and spread rapidly, resulting in widespread crop damage if environmental conditions are favorable. In addition to loss of quality due to spots, the downy mildew infections can also break down and rot if packed in bags and cartons.

In desert cropping systems, irrigation management can play an important role in foliar disease management. Because natural wetness periods are relatively short in duration, scheduling irrigations so as not to extend a natural wetness period can have a significant effect in reducing spore germination and therefore reducing disease incidence and severity. The use of resistant cultivars is the most effective means of controlling spinach downy mildew. During the past 50 years in California, each outbreak of a new downy mildew race was later matched by the development of resistant spinach lines. Until 1997 only four races were known to exist but in early 1998 race 4-resistant cultivars were infected by races 5 and 6 followed by race 7. After new resistant cultivars were developed, three new races were identified in California and designated as races 8, 9, and 10. In addition, a downy mildew isolate survey collected in California and Arizona between in 2004 and 2006 indicated that the new race 10 predominated in the areas sampled. Researchers and plant breeders are currently developing cultivars resistant to the new races. All foliar fungicide materials are protectants and for best results must be applied before infection occurs and before symptom development.

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 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 (visit http://tmdl.ucdavis.edu and click on the CIMIS link).

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

* Irrigation Management Unit, Imperial Irrigation District.