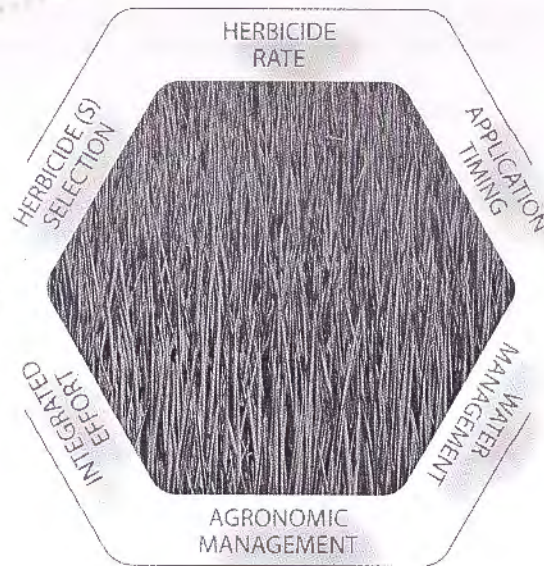


2019

RICE FIELD DAY



PROPANIL + FUNGICIDES

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KASSIM AL-KHATIB

ALEX CESESKI | AARON ALVAREZ

#	HERBICIDE PROGRAM	RATE/ACRE	TIMING	WEED CONTROL										CROP INJURY						PRICE* EXCL FUNGICIDES
				40 DAS					60 DAS					20 DAS			40 DAS			
				WATERGRASSES	SPRANGLETOP	RICEFIELD BURRUSH	SMALLFLOWER	DUCKSALAD	WATERGRASSES	SPRANGLETOP	RICEFIELD BURRUSH	SMALLFLOWER	DUCKSALAD	STAND REDUCTION	BLEACHING	STUNTING	STAND REDUCTION	BLEACHING	STUNTING	
1	Cerano SuperWham + Stratego + COC	12 lb 6 qt + 19 fl oz + 2.5% v/v	DOS Early tiller	100	100	89	98	64	100	100	91	100	80	21	19	14	4	0	0	\$140
2	Cerano Stam + Stratego	12 lb 7.5 lb + 19 fl oz	DOS Early tiller	100	100	76	98	58	100	100	76	100	79	48	35	50	6	0	0	\$159
3	Cerano SuperWham + Quadris + COC	12 lb 6 qt + 15.5 fl oz + 2.5% v/v	DOS Early tiller	100	100	90	98	74	100	100	80	100	80	25	23	25	4	0	0	\$140
4	Cerano Stam + Quadris	12 lb 7.5 lb + 15.5 fl oz	DOS Early tiller	100	100	78	98	76	99	100	83	100	83	16	15	19	5	0	0	\$159
5	Cerano SuperWham + Tilt + COC	12 lb 6 qt + 10 fl oz + 2.5% v/v	DOS Early tiller	100	100	86	98	76	99	100	84	100	84	48	24	30	1	0	0	\$140
6	Cerano Stam + Tilt	12 lb 7.5 lb + 10 fl oz	DOS Early tiller	100	100	70	97	69	100	100	66	100	83	45	19	44	6	0	0	\$159
7	UNTREATED	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8	UNTREATED	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

#	HERBICIDE PROGRAM	RATE/ACRE	TIMING	WEED CONTROL										CROP INJURY						PRICE* EXCL. PYRACLONIL	
				40 DAS					60 DAS					20 DAS			40 DAS				
				WATERGRASSES	SPRANGLETOP	RICEFIELD BULRUSH	SMALLFLOWER	DUCKSALAD	WATERGRASSES	SPRANGLETOP	RICEFIELD BULRUSH	SMALLFLOWER	DUCKSALAD	STAND REDUCTION	BLEACHING	STUNTING	STAND REDUCTION	BLEACHING	STUNTING		
1	UNTREAED	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2	Pyraclonil SuperWham + COC	14.9 lb 6 qt + 2.5% v/v	DOS 5 LSR	91	74	50	55	100	99	79	45	26	100	46	0	55	21	0	4		\$74
3	Pyraclonil Butte SuperWham + COC	14.9 lb 7.5 lb 6 qt + 2.5% v/v	DOS 1 LSR 5 LSR	98	100	94	99	100	96	100	100	83	100	45	0	43	6	0	1		\$168
4	Cerano Pyraclonil SuperWham + COC	6 lb 14.9 lb 6 qt + 2.5% v/v	DOS 1 LSR 5 LSR	99	99	63	55	100	100	100	61	19	100	24	0	30	1	0	1		\$107
5	Pyraclonil Bolero Ultramax SuperWham + COC	14.9 lb 23.3 lb 6 qt + 2.5% v/v	DOS 1.5 LSR 5 LSR	99	100	100	100	100	94	100	96	100	100	73	0	74	26	0	24		\$132
6	Pyraclonil SuperWham + COC Regiment + DyneAmic	14.9 lb 6 qt + 2.5% v/v 0.8 oz + 5 floz	DOS 5 LSR Early tiller	100	94	64	69	78	100	86	66	54	100	36	0	49	8	0	3		\$135
7	Pyraclonil Granite GR SuperWham + COC	14.9 lb 15 lb 6 qt + 2.5% v/v	DOS 2.5 LSR 5 LSR	100	85	99	100	100	75	66	100	96	100	34	0	29	20	0	11		\$148
8	Pyraclonil SuperWham + COC Loyant + MSO	14.9 lb 6 qt + 2.5% v/v 21.9 floz + 0.5 pt	DOS 5 LSR Mid-tiller	97	91	94	94	100	100	89	98	95	100	25	0	34	3	0	1		\$74

#	HERBCIDE PROGRAM	RATE/ACRE	TIMING	WEED CONTROL										CROP INJURY						PRICE
				40 DAS					60 DAS					20 DAS			40 DAS			
				WATERGRASSES	SPRANGLETOP	RICEFIELD BULRUSH	SMALLFLOWER	DUCKSALAD	WATERGRASSES	SPRANGLETOP	RICEFIELD BULRUSH	SMALLFLOWER	DUCKSALAD	STAND REDUCTION	BLEACHING	STUNTING	STAND REDUCTION	BLEACHING	STUNTING	
1	Butte Regiment + DyneAmic	7.5 lb 0.67 oz + 5 floz	1 LSR Mid-tiller	100	93	-	97	97	100	65	-	88	100	27	0	0	12	0	0	\$145
2	Butte Granite GR	7.5 lb 13 lb	1 LSR 3.5 LSR	100	97	-	98	100	100	70	-	97	100	13	0	0	25	0	0	\$158
3	Butte Granite SC + COC	7.5 lb 2.8 floz + 2.5% v/v	1 LSR Mid-tiller	100	100	-	97	100	100	97	-	92	100	22	0	0	13	0	0	\$154
4	Butte Grandstand CA + NIS	7.5 lb 1 pt + 0.25% v/v	1 LSR Full tiller	100	97	-	90	97	100	98	-	85	100	15	0	0	5	0	0	\$118
5	UNTREATED	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6	UNTREATED	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

#	HERBICIDE PROGRAM	RATE/ACRE	TIMING	WEED CONTROL										CROP INJURY						PRICE* EXCL. LOYANT
				40 DAS					60 DAS					20 DAS			40 DAS			
				WATERGRASSES	SPRANGLETOP	RICEFIELD BULRUSH	SMALLFLOWER	DUCKSALAD	WATERGRASSES	SPRANGLETOP	RICEFIELD BULRUSH	SMALLFLOWER	DUCKSALAD	STAND REDUCTION	BLEACHING	STUNTING	STAND REDUCTION	BLEACHING	STUNTING	
1	Clincher + Granite SC + COC Loyant + MSO	15 floz + 2.5 floz + 2.5% v/v 1.33 pt + 0.5 pt	4LS WG 1-Til WG	100	99	100	93	100	100	96	100	95	100	10	0	3	13	0	8	\$123
2	RebelEx Loyant + MSO	20 floz 1.33 pt + 0.5 pt	4LS WG 1-Til WG	100	100	95	83	100	100	98	99	88	100	13	0	3	17	0	7	-
3	Cerano Loyant + Granite SC + MSO	12 lb 1.33 pt + 2.5 oz + 0.5 pt	DOS 1-Til WG	100	100	88	60	100	100	100	96	68	100	20	3	0	12	0	10	\$120
4	Bolero Loyant + Granite SC + MSO	23.3 lb 1.33 pt + 2.5 oz + 0.5 pt	2 LSR 1-Til WG	100	100	98	93	100	100	100	99	98	100	20	0	0	3	0	3	\$112
5	Butte Loyant + Granite SC + MSO	7.5 lb 1.33 pt + 2.5 oz + 0.5 pt	DOS 1-Til WG	100	100	100	97	100	100	100	100	98	100	92	0	23	55	0	23	\$148
6	Cerano Loyant + Regiment + MSO	12 lb 1.33 pt + 0.67 oz + 0.5 pt	DOS 1-Til WG	100	67	63	47	66	100	67	64	48	67	17	3	7	10	0	7	\$117
7	Butte Granite GR	7.5 lb 15 lb	DOS 3 LSR	100	100	100	100	100	100	100	100	100	100	83	3	23	53	0	30	\$168
8	Butte Granite SC	7.5 lb 2.8 floz	DOS 1-Til Rice	100	99	100	100	100	100	100	100	100	100	85	3	20	47	0	27	\$148
9	UNTREATED																			\$0.0
10	UNTREATED																			\$0.0

#	HERBICIDE PROGRAM	RATE/ACRE	TIMING	WEED CONTROL										CROP INJURY						PRICE
				40 DAS					60 DAS					20 DAS			40 DAS			
				WATERGRASSES	SPRANGLETOP	RICEFIELD BULRUSH	SMALLFLOWER	DUCKSALAD	WATERGRASSES	SPRANGLETOP	RICEFIELD BULRUSH	SMALLFLOWER	DUCKSALAD	STAND REDUCTION	BLEACHING	STUNTING	STAND REDUCTION	BLEACHING	STUNTING	
1	Cerano Granite GR SuperWham + Grandstand + COC	8 lb 13 lb 4 qt + 1 pt + % v/v	DOS 5 LSR Full-Tiller	75	100	90	76	100	100	100	98	96	100	8	9	10	13	0	8	\$181
2	Cerano Granite GR SuperWham + Grandstand + COC	10b 13 lb 4 qt + 1 pt + % v/v	DOS 5 LSR Full-Tiller	50	100	90	63	99	100	100	96	88	100	15	6	10	13	0	3	\$192
3	Cerano Granite GR SuperWham + Grandstand + COC	12 lb 13 lb 4 qt + 1 pt + % v/v	DOS 5 LSR Full-Tiller	75	100	75	64	100	100	100	98	90	100	10	34	23	16	0	6	\$203
4	UNTREATED	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5	Cerano Granite GR SuperWham + Grandstand + COC	8 lb 13 lb 4 qt + 1 pt + % v/v	7 DAS 5 LSR Full-Tiller	0	100	95	80	100	100	100	94	85	96	53	0	25	16	0	10	\$181
6	Cerano Granite GR SuperWham + Grandstand + COC	10b 13 lb 4 qt + 1 pt + % v/v	7 DAS 5 LSR Full-Tiller	0	100	94	80	100	100	100	94	84	97	45	0	13	21	0	20	\$192
7	Cerano Granite GR SuperWham + Grandstand + COC	12 lb 13 lb 4 qt + 1 pt + % v/v	7 DAS 5 LSR Full-Tiller	0	100	94	64	100	100	100	73	54	90	80	33	43	48	0	10	\$203
8	UNTREATED	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

#	HERBICIDE PROGRAM	RATE/ ACRE	TIMING
1	Roundup WeatherMax + AMS Regiment + DyneAmic Clincher + COC	22 floz + 2% v/v 0.8 oz + 10 floz 15 floz + 2.5 % v/v	Spiking 3 LSR 3.5 LSR
2	Roundup WeatherMax + AMS Regiment + Prowl + DyneAmic Clincher + COC	22 floz + 2% v/v 0.8 oz + 2 pt + 10 floz 15 floz + 2.5 % v/v	Spiking 3 LSR 3.5 LSR
3	Roundup WeatherMax + AMS Regiment + Command + DyneAmic Clincher + COC	22 floz + 2% v/v 0.8 oz + 21 floz + 10 floz 15 floz + 2.5 % v/v	Spiking 3 LSR 3.5 LSR
4	UNTREATED	-	-

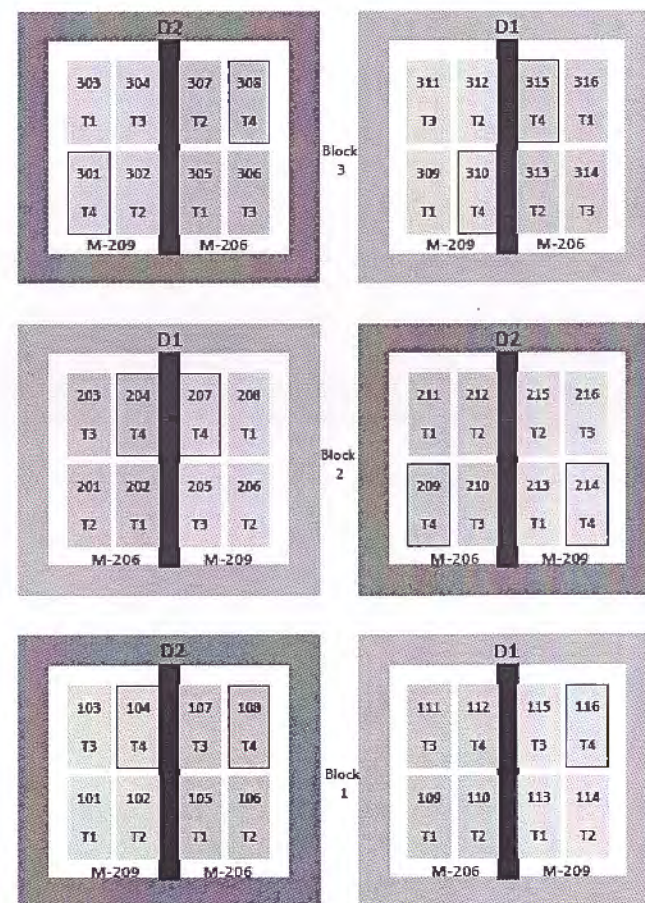
HERBICIDE PRICES

Herbicide	Unit	Unit Price
BOLERO ULTRAMAX	LB	\$2.50
BUTTE	LB	\$12.49
CERANO 5MEG	LB	\$5.50
CLINCHER CA	FLOZ	\$4.61
GRANDSTAND CA	FLOZ	\$1.51
GRANITE GR	LB	\$4.91
GRANITE SC	FLOZ	\$21.43
PROWL H2O	PT	\$6.00
REGIMENT CA	OZ	\$76.60
STAM 80 EDF	LB	\$12.34
SUPERWHAM	QT	\$12.31

EXAMPLE PER ACRE COST

	RATE	PRICE
23 LB		\$58.25
7.5 LB		\$93.68
8 LB		\$44.00
13 FLOZ		\$59.93
6 FLOZ		\$9.06
15 LB		\$73.65
2.5 FLOZ		\$53.58
2 PT		\$12.00
0.7 OZ		\$51.32
5 LB		\$61.70
4 QT		\$49.24

2019 Drillseed field layout



Hamilton Rd

ACKNOWLEDGMENTS

The generous support of the Rice Field Day and Rice Research Programs by the following organizations and individuals made this field day possible. We appreciate their cooperation and support.

FINANCIAL SUPPORT

Albaugh LLC
Zenith Agribusiness
Solutions
Farmer's Rice Cooperative
California Rice Commission
BUCRA
California Agricultural
Aircraft Association
R. Gorrill Ranch
Enterprises
Lundberg Family Farms
Tamaki Rice Corporation
Rue & Forsman Ranch
Partnership
USA Rice Federation
American Commodity
Company, LLC
Bayer Crop Science
Far West Rice, Inc.
Colusa County Farm
Supply, Inc.
GrowWest

Koda Farms Milling, Inc.

Brandt Consolidated, Inc.

SunFoods

TRUCKS

Wilbur Ellis Company

BUCRA

Delta Industries

Helena Chemical Company

PRODUCT/SUPPLIES

Biggs Farming Group

(Straw Bales)

Butte County Mosquito &

Vector Control District

Albaugh LLC (ALB 2023)

UPI (Super Wham®)

Wilbur-Ellis (Cerano®)

Far West Rice (sushi rice)

EQUIPMENT DISPLAY

Valley Truck and Tractor

Holt Ag Solutions

N&S Tractor

Peterson Cat

RICE FIELD DAY

Wednesday, August 28, 2019



*California Cooperative Rice Research Foundation, Inc.
University of California
United States Department of Agriculture
Cooperating*

Rice Experiment Station
P.O. Box 306, Biggs, CA 95917-0306

short grain and 13 compound grain types. All released varieties of the RES are included in the training population, thus capturing all genetic diversity of the RES breeding program.

Weed Control in CA Rice: Evaluation of New Weed Control Products and Methodologies

(K. Al-Khatib, A. Cseski, L.B. Galvin and A. Becerra-Alvarez, UCD)

The UC Rice Weed Research Program at the Rice Experiment Station, Biggs, CA seeks to assist California rice growers in achieving their weed control and herbicide resistant management goals. This year's program focuses on the performance evaluation of new herbicides (including those under development) in mixtures and/or sequential combinations with existing herbicides primarily for continuously-flooded rice growing system but also include applications for drill-seeded rice. Highlights of this year's program include new techniques for reducing weed pressures as well as a demonstration of new modes of action incorporated into existing weed control programs.

Continuously flooded systems have historically been the most common rice production method in California due to the suppression of most competitive rice weeds including barnyardgrass, watergrass, and sprangletop. In this system, a water depth of 4 inches is maintained throughout the season after seeding rice into a flooded field. When late post-emergence foliar applications are needed, water depth is lowered to expose about two-thirds of weed foliage to the herbicide spray, but fields are never completely drained. Contrary to these traditional strategies, two techniques, a leather's method and a drill-seeded plot, will be demonstrated this year to determine whether these alternatives to continuous flooding have similar weed control.

This year the predominant weed species were late watergrass, duckweed, ricefield bulrush, smallflower umbrella sedge, followed by barnyardgrass, monochoria, waterhyssop, redstem and sprangletop. All weeds evaluated in our program are susceptible to herbicides registered for California rice. Weed control efficacy of herbicide programs presented here primarily reflect the visual ratings (average of three or four replicates) 40 and/or 60 days after seeding (DAS). Rice injury (stand reduction, stunting, chlorosis, etc.) after herbicide application have also been noted wherever relevant.

Butte-Based Programs

This is the second year that Butte® has been available to California rice growers. Butte® is a granular mixture of benzobicyclon and halosulfuron active ingredients developed by Gowan Company. The benzobicyclon component of Butte® adds a new mode of action (HPPD-inhibitor) to the herbicide portfolio for water-seeded rice in California and is meant to provide control for broadleaf weeds, grasses and sedges. Previous studies suggest that Butte® provides good broad spectrum weed control, however, there is great need to consider using Butte in combination with other herbicide such as Clincher, Cerano, Granite, propanil, and Regiment to specifically improve grass weed control. This year weed control efficacy of Butte was tested in programs followed by Regiment, Granite GR, Granite SC, and SuperWham mixed with Grandstand CA. The combination of Butte® followed by other herbicides has provided good weed control results this field season.

Pyraclonil Herbicide Programs

Pyraclonil, a PPO-inhibitor, is a granular formulation currently under development for weed control in CA rice by Nichino America, Inc. PPO-inhibitors are a new mode of action available for CA rice growers, and pyraclonil should provide good control for broadleaf weeds, grasses and sedges. Previous studies demonstrated that pyraclonil would be best used as part of a comprehensive weed control program, but demonstrations include this herbicide as a stand-alone product. This year pyraclonil was applied as a part of programs which included Butte, Cerano, Bolero, Regiment, Granite GR, and Loyant. Results showed outstanding weed control including smallflower umbrella sedge and broadleaf weeds. Additionally, rice did not show signs of injury from pyraclonil.

Loyant Incorporated Programs

Loyant (florpyrauxifen-benzyl) is being developed by Corteva Agriscience and is a post-emergence herbicide in liquid formulation meant to control broadleaf weeds, grasses and sedges. Loyant is an auxin type herbicide, representing a mode of action that currently does not have any known resistant weeds in CA rice. This year Loyant was used in programs with Clincher, Granite, RebelEX, Cerano, Bolero, and Butte. When applied alone, this herbicide provides good weed control outcomes, but seems to be the most effective as an addition to existing programs. For example, applications with Loyant plus Granite provided near complete weed control.

Combined Fungicide and Herbicide Applications

Many growers use propanil (SuperWham, Stam) as a post emergent herbicide to reduce weed pressures in their fields. Propanil is a photosystem II inhibitor that will control grasses and sedges after the crop has been established. Around the time of propanil application, many growers are also applying fungicides such as Stratego (propiconazole, trifloxystrobin), Quadris (azoxystrobin), and Tilt (propiconazole), all of which are liquid, broad-spectrum disease control chemistries. However, there is uncertainty as to whether or not propanil application combined with these fungicides can cause crop injury. Previous studies demonstrated that carbamate insecticide application tanked mixed with propanil can cause crop injury, so there has been speculation regarding fungicide-propanil effect on rice. The objective of this study is to determine if crop injury is occurring with combined application of fungicides and propanil formulations. Results showed that all tank mixed fungicides with propanil was safe on rice.

Timing of Weed Control after Leather's Method

Leather's method is used in water-seeded systems by draining the field within the first few days after seeding and reflooding→ once the crop has established shallow roots, roughly 1 week after seeding. This allows for good crop establishment and rooting, but also allows weeds the opportunity to become highly competitive with adequate moisture for germination and low water depths for emergence and rapid development. Many growers use Cerano (clomazone), a micro encapsulated granule, to control sprangletop, barnyardgrass by way of carotenoid biosynthesis which causes bleaching symptoms. Cerano has a day of seeding application timing with a 14-day water holding period once applied to a field. However, if growers are using a Leather's method, it is not possible to use Cerano because of the labeled water holding requirements. In this study Cerano was applied at the day of seeding and well as after a Leather's method, ~7DAS, to determine if there was adequate weed control as well as any crop damage. In general, Cerano applied after leathering accentuated injury on rice.

Rating Drill-Seeded Program for Weed Control Efficacy

This season saw continued field validation of weed control options and crop response when rice is drill-seeded to a 1" or greater depth. The strategy behind deep drilling is to place the rice seed below the zone of weed germination and emergence. This technique should delay stand emergence and allows for a burndown application of an economical broad-spectrum herbicide, such as glyphosate, to control the majority of grasses and sedges. The use of glyphosate can also aid in

management of weeds that are resistant to common rice herbicides. This program relies on flush irrigation for the first few weeks, which inhibits broadleaf weeds and may also provide some water savings. In addition, foliar herbicide efficacy should be increased under early season flushing, as more of the weed leaf surface is exposed.

The current study uses M-206 and M-209 planted at 1" and 2" depths. Herbicide programs include a post plant, pre-emergence glyphosate burndown, followed by Regiment and either Prowl or Command (the liquid formulation of clomazone) for late season weed inhibition, and an application of Clincher for sprangletop. Results show excellent weed control for all treatments in 2018 and 2019. Yields for both cultivars were similar to local averages in 2018 with no depth dependent difference in yields; stand measurements for 2019 suggest similar results for the current field season.

Managing Nitrogen Fertilizer

Bruce Linquist, J. Ray Stogsdill, Peter Geoghan, and Telha Rehman, UCCE & UC

Assessing mid-season plant N needs

We generally recommend applying all the N fertility requirements for an average yielding year at the start of the season. This N is applied as either aqua-ammonia or as part of a starter fertilizer blend (the starter blend can be applied up to 4 weeks after planting if algae/scum is a problem). At panicle initiation (PI - about 45-55 days after planting), the crop should be assessed to determine if a top-dress of nitrogen fertilizer is necessary. A good assessment is important because not applying N when needed can lead to a reduction in yield; however applying N fertilizer when it is not needed can lead to lodging, delayed maturity, increased incidence of disease and reduced yields. There are several tools available to do this. The Leaf Color Chart was developed to help with this assessment and is still a valid tool to use. Its limitations are that it is time consuming and limited to a relatively small area.

The Green Seeker handheld crop sensor is a new tool that we have been testing for this purpose. It measures the NDVI (Normalized Difference Vegetation Index) of the canopy. Based on preliminary data, we have developed a response index to help growers decide when a top-dress N application is necessary. We have found that an index of 1.1 or greater indicates the need for top-dress N application. The response index is the NDVI reading of an enriched N strip (representing a crop with unlimited N) divided by the NDVI reading from the field test area. The