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To: County Extension Directors or Agriculture/Natural Resource Agents.

Re: Soil and Crops Extension Newsletter "From the Ground Up"

I am writing to you regarding the use of this newsletter and upcoming editions. It is being sent to all County and Area offices.

The newsletter is sent to you to be a source of research based information on topics related to cropping systems, soils, and agronomy for teaching and extension outreach. Please feel free to use any item contained in the newsletters for your Extension programs. You may use each article in its whole or in part so long as the informational content is not substantially altered.

Consider including a link to this newsletter on your county website and in newsletters. You are also encouraged to "cut and paste" articles from the newsletter for your own media outreach and programming efforts.

Our goal is to provide you with current updates on new research or on topics that are currently causing interest by the people of Colorado.

I encourage you to contact me or any of the newsletter writers with suggestions for future articles for upcoming newsletters. We are planning on publishing this newsletter quarterly on or around the beginning of the third month of each quarter (March, June, September, December).

The Soil and Crop Sciences Extension Team are looking forward to hearing from you.

Sincerely,

Bruce Bosley

from the ground up Agronomy News

Using Residual Herbicides with Roundup Ready Crops

Alan Helm, Golden Plains Area Extension

Roundup Ready crops are an effective tool for the management of weeds that emerge after the crop. However there is some debate among producers as to whether residual herbicides are needed as well. Residual herbicides are a good weed management tool to protect crops during the Critical Weed Free Period (CWFP). The CWFP varies from crop to crop, however it is the time required to allow crops to become competitive with undesirable plant species. Protecting Crops during the CWFP will also protect potential yield as well. One study on Express Tolerant sunflowers done in North Dakota showed that the use of residual herbicides produced 3 times more than the treatments that did not include residual herbicides. A Study done in Texas in 1996 and 1997 showed that johnsongrass control was increased from 78% to 90% with the use of residual herbicides. In limited irrigation settings weed management will become more of an issue due to lack of water availability to crops. Research being conducted on limited irrigation in Colorado has shown that the use of residual herbicides has consistently eliminated at least one application of glyphosate during the growing season.

There are several choices of residual herbicides to use in Roundup Ready crops. Choosing the correct herbicide can make a difference in crop competitiveness and yield. Making the right decision depends on the knowledge of particular weed species, their growth habit, and germination conditions, as well as keeping in mind that herbicide selection can have impacts on crop rotations. For instance, when using any residual herbicide containing atrazine in corn there is an 18 month rotation restriction back to sunflower. The label on each herbicide will list any rotational restrictions by crop.

Another consideration to keep in mind when choosing Roundup Ready crops is the management of volunteer plants the next cropping season such as Roundup Ready corn in your Roundup Ready soybean. Yes I realize that glyphosate is relatively inexpensive, however, rotating to other non-herbicide or other herbicide tolerant crops such as Imidazolinone tolerant varieties will allow for the management of those volunteer plants with glyphosate. This last point also brings up the fact that more and more weed species are becoming tolerant to glyphosate every year. The more we rely on a single management practice the less effective it will become over time. Rotating herbicide modes of action could allow for the extension of tolerance development in this region.

Keeping these ideas in mind can make your crop management less stressful and improve your profitability.

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Rocky Mountain Compost School

Colorado State University is pleased to announce that it is sponsoring the second Rocky Mountain Compost School for large-scale composters from March 31- April 3, 2008 at the Agricultural Research and Development Center (ARDEC), Fort Collins, CO. This school will be useful to anyone who is involved in producing farm-scale or commercial scale compost, who is considering entering the composting business, such as dairy and feed lot personnel, who uses or promotes the use of large amounts of compost in landscaping or farming operations, or who regulate or permit compost facilities. We encourage livestock producers considering composting or who currently compost to attend. Topics to be covered include the microbiology of composting, evaluation of feedstocks for composting and creating successful feedstock mixes, hands-on compost making and monitoring, troubleshooting problems, monitoring and sampling compost, developments in testing compost, compost utilization, marketing, regulations, composting equipment, and other selected topics.

The course also includes a daylong field trip to visit several local compost facilities. The information presented in this short course is designed to support the growing compost industry in Colorado and the Rocky Mountain West. To register or for more information, please visit our web site at http://www.rockymountaincompostschool.info or call Kierra Jewell at 970-491-6201.

From the Ground Up: Agronomy News is a quarterly publication of Extension, Department of Soil & Crop Sciences, Colorado State University, Fort Collins, Colorado.

Web Site: http://www.extsoilcrop.colostate.edu/Newsletters

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Nitrogen Management for Irrigated Sunflowers

Joel Schneekloth and Troy Bauder

Irrigated sunflower fertility research in Colorado is limited. Most of the research has been done for dryland production or in regions with higher precipitation. In that research, only low nitrogen (N) fertilizer rates are required to maximize yields. However, the yield potential of irrigated sunflowers is much higher than dryland sunflowers. Sunflower has shown promise for an irrigated crop with limited amounts of water. Due to its aggressive root system, it can utilize deep moisture unavailable to other crops. When "mining" this deep moisture, sunflowers may also utilize any residual deep soil N. We conducted research near Burlington, Colorado in 2006 and 2007 to better understand the optimum N fertility needs of full and partially irrigated sunflowers.

Methods:
Oilseed sunflowers were grown in a corn-sunflower-soybean-winter wheat rotation utilizing no-till (2006) and strip tillage (2007) management. The plant population was 22 – 24 thousand plants per acre. We applied N fertilizer rates at pre-plant of 0, 75, 150 and 225 lbs N per acre. Additionally, two strategies that utilize the potential for fertigation were investigated. One of the fertigation treatments had 75 lbs per acre of pre-plant N applied, while the other treatment had no N applied pre-plant. Both received 75 lbs per acre applied prior to bloom (R3 growth stage). Irrigation management strategies included full irrigation supplementing precipitation so no water stress was observed, and an allocated management applying no more than 5 inches of irrigation during the growing season. This water was applied during the reproductive growth stage of sunflowers.

Soil samples were taken to the three-foot soil depth spring and fall for allocated irrigation sunflowers and analyzed for residual NO_3-N. Spring soil samples for full irrigation were taken but fall samples are not available at this time. They will be sampled in the spring of 2008. The soil texture is a silt loam with 1.6 to 1.8 % organic matter content.

Results:
Growing season precipitation at Burlington was near average in 2006 and below average in 2007, 12.8 and 7.1 inches respectively. Good growing conditions resulted in better than average yields in 2006 and lower yields in 2007. Maximum grain yields were greater than 3000 lbs per acre for both allocation and full irrigation when fertilized with at least 150 lbs. N per acre. The highest yield was obtained in 2006 with 150 lbs of N split applied in the allocation treatment. When averaged across years, the full 150 lbs split applied fully irrigated treatment had the highest yield. Grain yields increased with increasing N to 150 lbs per acre (Table 1) applied pre-plant for both allocated and full irrigation sunflowers.
Grain yields increased approximately 400 and 500 lbs per acre from 0 to 150 lbs of N for allocated and full irrigation respectively. Seventy five lbs of N increased yields more in the allocated irrigation treatment (200 lbs grain per acre) than with full irrigation (70 lbs grain per acre). Applications of N above 150 lbs per acres resulted in similar or lower yields for both allocated and full irrigation. Grain yields for 0 and 75 lbs N were greater for allocated irrigation as compared to full irrigation sunflowers in 2006 and greater for full irrigation than allocated irrigation in 2007.

Splitting N applications or applying N during the early reproductive growth stages slightly increased grain yields. For full irrigation, splitting 150 lbs of N between pre-plant and post resulted in similar yields as compared to applying the entire N pre-plant. However, fertigating 75 lbs N in allocated irrigation resulted in similar yields as compare to 150 lbs of N pre-plant. Fertigating only 75 lbs N in the full irrigation regime did not maximize grain yields when averaged across both years, but improved grain yields over applying 75 lbs N pre-plant in 2006 and showed similar yields in 2007.

Residual Soil N:
Residual soil N by depth is shown in Figure 1. Applications of 75 lbs per acre N or less resulted in reduced N amounts in each of the three sample depths to three feet. Applications of 150 lbs N per acre resulted in increased residual soil N in the top depth (0-6 inches), but reduced soil N in the 6 to 24 and 24 to 36 inch soil depths. Applications of 225 lbs N per acre increased residual N in the 0 to 24 inch soil depths reinforcing the yield results that 150 lbs. of N per acre was sufficient for the potential yield in this irrigation regime. Splitting the N into 75 lbs applied pre-plant and 75 lbs applied during reproductive growth did not result in lower residual soil N as compared to 150 lbs applied pre-plant. All application rates resulted in reduced N in the 24 to 36 inch soil depth as compared to spring levels. Applied N appeared to not leach past the 24 inch sample depth due to irrigation management.

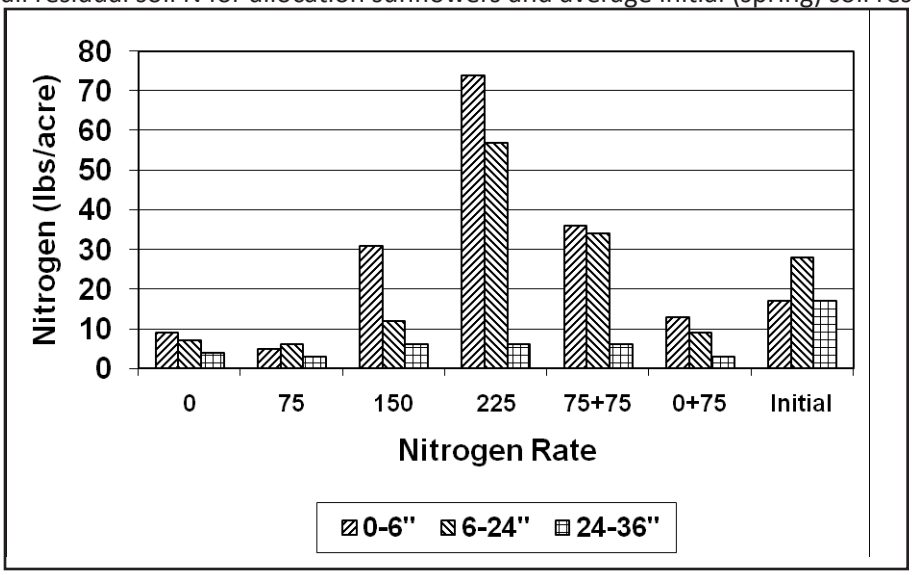
Conclusions:
Grain yields for sunflowers increased with increasing N rates up to 150 lbs N/acre. However, this rate of N may not be the highest economical yield given today's price of N. With limited irrigation, late season applications of N appear to have added benefits to yield as compared to pre-season applications. Water management practices appear to impact the

economic application of N. When irrigation is limited in the vegetative growth stage, application of N greater than 75 lbs per acre did not increase grain yield. However, when full irrigation practices are used, applications of 150 lbs per acre generated the greatest yield response. This study will be continued for at least another growing season.

Table 1. Grain yields for N rates for allocation and full irrigation sunflowers.

	Allocation Irrigation			Full Irrigation		
N Rate	2006	2007	Average	2006	2007	Average
lbs/acre	---------- lbs/acre ----------			---------- lbs/acre ----------		
0	2784	2335	2560	2597	2472	2534
75	2804	2779	2792	2670	2532	2601
150	3085	2736	2911	3073	2941	3007
225	3037	2726	2881	2274	2785	2529
75+75	3180	2848	3014	3035	3045	3040
0+75	3099	2694	2897	2823	2513	2668

Figure 1. Fall residual soil N for allocation sunflowers and average initial (spring) soil residual.



Links and Resources:

Golden Plains Area Extension: http://goldenplains.colostate.edu

Rocky Mountain Compost School: http://www.rockymountaincompostschool.info

CSU Crops Testing Programs: http://www.csucrops.com

Colorado Seed Programs: http://www.seeds.colostate.edu