CERTIFIED CROP ADVISER

CCA ADVANTAGE

The Voice of the Certified Crop Adviser Program
www.agronomy.org/cca

CCAs Implement New Security Measures

A survey taken last month by the Certified Crop Adviser (CCA) program and *AgProfessional* magazine reports 68 percent of the crop input retailers have implemented employee security training measures in the wake of 9/11 and other terrorist threats.

The 285 CCAs participating in the nationwide survey reported they have upgraded their locations' physical facility and personnel training, implemented new federal and state government regulations and taken other measures.

Along with security training CCAs reported that 56 percent have upgraded facilities with items such as fencing, better lighting and more secure locks. Thirty-one percent of the respondents have participated in the Security Vulnerability Assessment (SVA) program (see below). About one-third of the CCAs polled have instituted more thorough background checks on new employees. Nearly a quarter of those taking the survey said they have stopped selling certain products that could be a high risk if they fell into the wrong hands. Only 15 percent of those polled indicated they have not implemented new security precautions.

More than half of those polled (58 percent) reported that their organizations have written security policies that outline restricted areas and security procedures. Included in these policies were 85 percent reporting that counter people have been trained to recognize regular customers. Seventy-six percent were concerned or somewhat concerned about product theft at their facility. Sixty-four percent registered high concern about their facility's vulnerability to terrorism.

Limited access to locked crop protection products has been implemented by nearly all of the respondents. Just a little more than half are conducting security training for employees. When asked if facilities were fenced and lighted, the numbers fell off a bit and only 46 percent reported a completely locked and lighted facility.

Table 1

Percent of CCAs reporting their organizations have taken the following security precautions:

Provided employees with security training	68%*
Upgraded facilities (fencing, lighting, locks, etc.)	56
Participated in the Security Vulnerability Assessment (SVA) program	36
Implemented more thorough background checks on new employees	31
No longer sell certain products	23
No changes implemented	15

**totals more than 100% due to multiple actions being taken*

Table 2

Percent of CCAs reporting their organizations have a written security policy that outlines restricted areas and security procedures

Yes	58%
Currently in development	19
No	23

Table 3

Level of concern about the following security risks:

	Very Concerned	Somewhat Concerned	Concerned	Not
Product theft	46%	30%	19%	5%
Complying with new state and federal security regulations	35	43	16	6
Vulnerability of your facilities to terrorism	22	42	28	
Vulnerability of crops in the field to terrorism	6	17	32	45

Table 4

Security practices currently implemented at facility(ies)

	Percent of CCAs
Pesticide storage is locked	96%
Limited access to storage areas	83%
Counter people trained to know your customers	85
Security training classes for employees	53
Facility(ies) are fenced and lighted	46

Security Tool Endorsed by Major Associations

The Security Vulnerability Assessment (SVA) program utilized by a little more than one-third of poll respondents was developed by Asmark, Inc., and meets the Center for Chemical Process Safety security vulnerability assessment design criteria. As a result, retailers who use this program to assess facility security can do so with confidence that their assessment is based on sound risk assessment principles.

Additionally, the SVA tool allows retailers to satisfy one part of the Department of Transportation's (DOT) new rule requiring shippers of hazardous materials to complete vulnerability assessments and transportation security plans.

The SVA is available through state fertilizer, agricultural chemical or agribusiness associations as well as the Agricultural Retailers Association, CropLife America and The Fertilizer Institute.

Nitrogen Availability in Wet Soils

By Jeff Polenske, CCA
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How much nitrogen is available for a crop when the fields are cold and saturated with 15 to 22 inches of rain in one month?

Last spring, with funding provided by the Wisconsin Corn Growers Association, CCAs **Paul Knutzen**, New London, WI, and **Bruce Ludolph**, Sauk City, WI; **Tom Novak**, of the Wisconsin Association of Professional Agricultural Consultants; and I set out to discover the answer. We took 53 pre-sidedress nitrogen test samples from fields in eight central and eastern Wisconsin counties. The samples were sent to a University of Wisconsin lab for testing.

The results of the testing showed that in most cases very little nitrogen was left in the soil, so we advised our customers to sidedress additional nitrogen. The corn greened up and we were all pleased with the results.

Later, when soils were warmer, a round of follow-up tests suggested that a second nitrogen application of 40 to 50 pounds per acre was needed. At harvest time, the higher yields on the applied versus the non-applied fields confirmed the appropriateness of the second application.

Several Basel stalk nitrogen tests were also done to check for over-application of nitrogen. In about 90 percent of the cases the nitrogen content was fine, but a few tests did show that an over-application was done. These fields will be followed up in 2005 to recover any nitrogen remaining from the 2004 applications.

SIDEDRESS AT ONE FOOT OF GROWTH

Our tests show that the best time to sidedress corn is just as it reaches one foot, but nitrogen application will be effective in increasing yields all the way up to tasseling. We are getting better at tracking nitrogen in the soil and its use in growing corn. Our plans are to continue to write good Nutrient Management Plans with follow-up such as this example where nitrogen is applied responsibly both for the producer's bottom line and for the environment.

With a Wisconsin regulation stating that, beginning the first of the year, Nutrient Management Plans are required for all nutrient applications to fields located in watersheds draining to outstanding or exceptional resource waters or impaired waters, tracking nitrogen becomes an even more critical issue.

Editor's note: *This is just one example of the type of service that CCAs provide to their customers. If you have conducted research projects with crops in your area and would like to share that information with other CCAs, e-mail Betsy Ahner at the International Certified Crop Advisers headquarters in Madison, WI, bahner@agronomy.org.*

Indiana CCA Conference

By Dr. Kim Polizotto, CCA, Chief Agronomist, PostashCorp/PCS Sales

The Indiana CCAs wrapped up their sixth successful Crop Adviser Conference last December in Indianapolis with 487 people registered. In 1999 the conference started out as a one-day meeting and offered six to seven CEUs to the 220 advisers attending. In 2003, after teaming up with Purdue University Extension, the conference evolved into a two-day program, with four concurrent sessions.

The concurrent sessions are broken out by the four major competency areas, and morning presentations are repeated in the afternoon to make sure people can hear most of the talks they want to. The Indiana Conference now offers 16 CEUs with the opportunity for four additional self-study units. The program proceedings are given to the attendees on a CD and the four self-study units are part of the CD.

I was conference co-chair and believe the meeting has been successful for two major reasons. First is that we have always brought in top speakers on the key subjects. Most speakers are from other states and are experts our members probably wouldn't get a chance to hear if we didn't sponsor this program. The other major reason for success is that several CEUs can be earned in each of the competency areas, making it easier for our members to meet their requirements.

Incoming Indiana CCA Board Chairman Jeff Nagel addresses the convention's crowd while Outgoing Chairman Lance Murrell looks on.

I would encourage any state to try to sponsor a special conference for CCAs. We are continually looking for ways to add value to the CCA program, and this really is well attended by our members.

I would also acknowledge the support from Purdue University Extension. Without their help in program planning, developing self-study materials and production of the proceedings CD, we couldn't pull this off. It has truly been a win-win program for the Indiana CCA and Purdue.

Chairman's Corner

Ethics — Doing the Right Thing

By Steve Dlugosz, CCA
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Being chair of the Certified Crop Adviser (CCA) Program has its challenges. Facing concerns over ethics violations is one of those. Fortunately, the number of reported incidents is quite low for a program with a membership so large. Several years ago I wrote an article on ethics and our crop advising profession. I received a number of positive responses to it, so I decided to rewrite it for this month's Chairman's Corner.

All of us signed a Code of Ethics when we became CCAs. Our Code of Ethics contains five specific articles, which relate to different segments of our profession. Most of these articles are relatively clear-cut and can be easily applied to obvious lapses in ethical behavior. Cheating a client, stealing from an employer and intentionally making a recommendation that harms persons or property are obvious examples of unethical behavior.

LETTER OF CONCERN

Situations that might seem less offensive but are still considered a breach of ethics would include signing your buddy's name and number on a CEU sign-in sheet, making off-label pesticide recommendations and promoting agronomic programs that provide little or no benefit to the grower. I've heard from individuals who are frustrated that a few CCAs are doing things like this and are still in the program. Unfortunately, the CCA program was never intended to clean up all the improprieties that exist in the business of crop production.

However, it's also important to understand that Article V of the Code of Ethics states, "A Registrant having positive knowledge of deviation from this Code by another Registrant shall bring such deviation to the attention of the Board." Most of us are probably hesitant to pursue such action, but do recognize that a well-defined and structured inquiry begins with a letter of concern to the local Board.

SOUND FAMILIAR?

What about the more mundane or common situations that arise each day? Could some of these be considered unethical or a breach in the code of ethics? See if any of the following situations (and accompanying justifications) sound familiar:

- Providing a misleading in-field diagnosis to protect your company or product.
  "This could cost us a lot."
- Manipulating test plot results to improve your product's performance.
  "That's how everybody does it."
- Misrepresenting facts to help a customer qualify for a manufacturer's re-spray program.
  "They're a big chemical company — they can afford it."
- Fudging expense reports.
  "The company owes me."
- Discussing confidential information with other clients and co-workers.
  "Everybody already knows about that situation."
- Giving products or services away against company policy.
  "They'll never know."
- Tweaking sales figures to meet goals.
  "But I'm so close."
- Treating clients and coworkers with a lack of respect.
  "That guy deserves it — he's an idiot."
- Leaving a conference early.
  "That speaker is really boring and I already signed the sheet."

Are all of these situations a breach in ethics? Probably not. Are some of these examples of unprofessional behavior? Yes. The point here is the difference between unprofessional and unethical behavior is not always clear. It's not unusual for people to work under different value systems and thus interpret certain situations differently. So what do you do?

At the risk of sounding like a preacher or your mother, I offer this suggestion: Simply do what's right. That's what ethics is all about. None of us can control how others think or act. All we can do is concentrate on our own behavior, and hopefully be a good example to others of what it means to be a professional CCA.

Influence of Early-Season Nitrogen and Weed Management on Glyphosate-Resistant and Susceptible Soybeans

By Larry G. Heatherly, Stan R. Spurlock, and Krishna N. Reddy

EARN ONE CEU!
All CCAs may earn up to 20 Continuing Education Units (CEUs) per two-year cycle as board-approved self-study articles which will include CCA Advantage articles. The CCA CEU logo (above) marks all pre-approved material, with the CEU value indicated by the number in the middle. To receive one CEU in nutrient management, read this article, fill out the attached exam and mail the tear-out form, along with $10, to the American Society of Agronomy.

During the past decade, advances in biotechnology coupled with plant breeding have resulted in development of glyphosate-resistant (GR) soybean cultivars for use in soybean production systems. A 1996 study concluded that, except for tolerance to glyphosate, GR genotypes are substantially equivalent to parental lines and other soybean cultivars not tolerant to glyphosate. Glyphosate is a nonselective herbicide that kills most annual and perennial grass and broadleaf weeds. Weeds of the same species that differ in size can be controlled simply by increasing the rate of glyphosate, so herbicide application timing for adequate weed control is of less concern than when using nonglyphosate herbicides. Because glyphosate has no carryover or soil persistence, producers can use a glyphosate-only weed management program with no concern for choice of rotational or following crops.

Glyphosate-resistant cultivars offer producers the flexibility to control a broad spectrum of weeds in soybeans with no concern for crop safety. Cost of weed control using a postemergence management program for GR cultivars should be less, even with the greater cost for seed of most GR cultivars. This could translate to increased profits if yields from GR cultivars are equal or nearly equal to those from non-GR cultivars. Use of GR cultivars should preempt the use of tillage and pre-emergent herbicides for weed management. The flexibility of using either nonglyphosate herbicides or glyphosate on GR cultivars increases management options for weed control when GR cultivars are used. Nonglyphosate herbicides applied to GR soybeans in monocrop or corn–soybean rotation systems do not adversely affect GR soybeans.

Glyphosate inhibits 5-enolpyruvylshikimate-3-phosphate synthase (EPSPS) and thus blocks aromatic amino acid synthesis. While GR soybean cultivars contain resistant EPSPS, the principal N-fixing bacterium for soybeans does not contain a resistant enzyme. Thus, glyphosate applied to GR soybeans may interfere with the symbiotic relationship. Conditions and treatments (like glyphosate) that adversely affect the symbiotic relationship may influence the sensitivity of N_2 fixation to water deficits.

Soybeans grown on most soils do not respond to preplant N fertilization. In most cases, N fertilization of soybeans is an unnecessary expenditure. Also, concentrations of N surrounding soybean roots can delay or impede nodulation and thus reduce N fixation.

Soybeans, especially when not irrigated, provide relatively low gross return with a small margin for profit in the mid-Southern U.S. This small profit margin dictates that all inputs associated with production must be evaluated with respect to their likelihood of increasing profitability and that yield losses due to controllable pests such as weeds must be prevented within economic constraints. Weed management expenditures are almost always made before the onset of drought and without knowledge of ensuing moisture status for subsequent crop and weed development. This presents a challenge.

Measuring the effect of glyphosate on GR cultivars involves use of nonglyphosate pre-emergent and postemergent herbicides on both non-GR and GR cultivars and glyphosate on GR cultivars. It also involves the application of early-season N to both non-GR and GR cultivars that are grown under the same weed management system (WMS). The treatments used in this study address these criteria. This research was designed to determine if the perceived effect of glyphosate on the symbiotic relationship between N-fixing nodulating bacteria and GR soybean cultivars can be overcome with, or compensated for by, the addition of N soon after planting in the field. The objective was to compare the yield and economic return from GR and non-GR soybean cultivars where early-season N was applied before application of postemergent nonglyphosate and glyphosate herbicides in non-irrigated (low-yielding) and irrigated (high-yielding) environments in the mid-Southern U.S. Economic analysis of results was conducted to assess the profitability of two WMSs and added N. Seed yields and estimated costs and returns were used to generate budgets for the economic comparisons.

MATERIALS AND METHODS

Field studies were conducted from 1999 through 2001 at the Delta Research and Extension Center at Stoneville, MS, on Sharkey clay soil. Sharkey is the dominant soil series in the

lower Mississippi River Valley alluvial flood plain. The pH at the study site ranged from 6.8 to 7.3, and P and K levels were in the high category. Separate non-irrigated and irrigated experiments were conducted. Treatments were randomly assigned to plots at the beginning of the study and remained in the same location thereafter to determine effects where the same WMS and N level were used continuously. Plots were 4 m wide (8 rows) and 22 m (irrigated) or 20.5 m (non-irrigated) long.

All experiments were seeded into a stale seedbed that had been tilled the preceding fall. Fall tillage consisted of chisel plowing 45 cm deep followed by shallow tillage with a disk harrow and spring-tooth cultivator in 1998 and 1999 and shallow tillage with a disk harrow and spring-tooth cultivator in 2000. Glyphosate at 840 g a.i. ha^{-1} in 94 L ha^{-1} water was applied preplant to each site each year to kill existing weed vegetation.

Non-GR and GR cultivars were used each year. Cultivars were chosen based on regional variety trial results, use patterns by producers and recency of release. Planting dates were May 17, 1999; April 28, 2000; and April 2, 2001. Seed were treated with mefenoxam fungicide at 0.11 g a.i. kg^{-1} seed before seeding each year.

Levels of N were 0 and 35 kg ha^{-1} surface-applied as granular ammonium nitrate on June 7, 1999; May 15, 2000; and April 11, 2001. These applications were made within 14 days after emergence and before stage V2 and preceded all postemergent herbicide applications. Rainfall of >2 cm occurred 19, 5 and 1 day after N application in 1999, 2000 and 2001, respectively. Costs for the N and its application were \$38.20 ha^{-1}, \$41.40 h^{-1} and \$48.96 ha^{-1} in 1999, 2000 and 2001, respectively.

Weed management systems each year were (1) pre-emergent broadleaf followed by postemergent broadleaf and grass weed management using nonglyphosate herbicides applied to both GR and non-GR cultivars (PRE + POST) and (2) postemergent broadleaf and grass weed management using glyphosate on GR cultivars and nonglyphosate herbicides on non-GR cultivars (POST). Within each WMS, use of herbicides and their combinations was dictated by expected weed populations (PRE) or actual populations (POST). Expert opinion during the growing season was used to determine when weed populations within each WMS were sufficient to justify application of postemergent herbicides and what herbicides to use. The PRE + POST WMS for GR cultivars received nonglyphosate herbicides applied postemergence to determine the effect of N application on GR cultivars that had no glyphosate applied to them. Two applications of glyphosate applied sequentially to GR cultivars in the POST treatment is supported by results from previous research. The objective in each WMS was to use the rates of glyphosate or nonglyphosate herbicides most likely to minimize weed competition within the constraints of each individual WMS each year. Herbicides were broadcast-applied each year at labeled rates with recommended adjuvants and in recommended tank mixes.

In the irrigated experiments, water was applied by the furrow method through gated pipe whenever soil water potential at the 30-cm depth, as measured by tensiometers, decreased to between -50 and -70 kPa. The effect of irrigation on yield of soybeans in the mid-Southern U.S. is well documented, but irrigation environment can also affect infestation levels of some weed species.

Weed control was determined after soybean leaf senescence to measure the season-long effect of WMSs that were intended to give complete weed control. Control of individual weed species was visually estimated based on weed density.

A field combine modified for small plots was used to harvest the four center rows of each plot on Sept. 10 (nonirrigated) and 23 (irrigated), 1999; Sept. 15 (nonirrigated) and 19 (irrigated), 2000; and Sept. 10 (irrigated), 2001. The nonirrigated study was not harvested in 2001 due to extreme weed reinfestation resulting from incomplete soybean canopy closure and above-normal rainfall.

Estimates of total expenses and returns were developed for each annual cycle of each experimental unit. Total specified expenses were calculated using actual inputs for each treatment in each year of the experiment and included all operating expenses and machinery ownership costs but excluded charges for land, management and general farm overhead. Costs for machinery and operating expenses were based on prices paid by Mississippi farmers each year. Operating expenses included those for herbicides and adjuvants; seed; rollout vinyl pipe used in irrigation; labor; fuel, repair and maintenance of machinery and irrigation systems; hauling harvested seed; and interest on operating capital. The price of seed for GR cultivars was \$0.46 kg^{-1} more than that for non-GR cultivars in 1999 and \$0.42 kg^{-1} more in 2000 and 2001; this extra cost was added to the weed management expense for GR cultivars. Weed management expenses after planting were calculated for each treatment and included charges for herbicides, surfactants and application. Irrigation expenses were based on a 65-ha furrow irrigation setup and included an annualized cost for the engine, well, pump, gearhead, generator, fuel tank and lines, and land leveling. The USDA loan rate of \$0.196 kg^{-1} soybean for Mississippi was used to calculate income from each experimental unit each year. Net return above total specified expenses was determined.

RESULTS AND DISCUSSION

Weather and Soybean Development. All years experienced undesirable weather at some time. In 1999, average monthly maximum temperatures during April through June were near normal. High temperatures in conjunction with little rainfall in July and August resulted in severe stress for all cultivars in the nonirrigated environment. This stress was exacerbated by the relatively late planting date of May 17 in 1999 and the beginning bloom through full seed period occurring from late June through late August. In 2000, average monthly maximum temperatures from April through June were near normal while July and August temperatures were above normal. Rainfall in July and August of 2000 was only 16 mm. The beginning bloom through full seed period occurred from early June through mid-August. These conditions resulted in severe stress for cultivars in the non-irrigated environment. In 2001, average monthly maximum temperatures were near normal in all months of the growing season. August 2001 rainfall was above normal and a record for the month. The beginning bloom through full seed period occurred from early May through late July. Low rainfall amounts in July and August of 1999 and

2000 resulted in greater irrigation amounts in those years than in 2001.

Weed Management Expense and Weed Control. Weed management costs for GR cultivars were always less with POST (only glyphosate used) than with PRE + POST (nonglyphosate herbicides used). For non-GR cultivars, PRE + POST was cheaper than POST in 1999 and 2001 while costs of the two were similar in 2000. Costs for PRE + POST applied to GR cultivars were greater than for PRE + POST applied to non-GR cultivars because of the greater cost for seed of GR cultivars. Costs for POST applied to GR cultivars were less than for POST applied to non-GR cultivars. This cheaper weed management with postemergent glyphosate compared with non-glyphosate postemergent herbicides over the course of this study agrees with results of several other studies. Over the three years of this study, POST for GR cultivars cost the least, and PRE + POST for GR cultivars cost the most.

All WMSs provided excellent weed control at the end of the weed control period (immediately before irrigation initiation). In the non-irrigated environment, control of predominant weed species at harvest ranged from 93% to 100% in 1999 and 2000, with no significant differences between years. Control of these species averaged across years was ≥94% regardless of cultivar, WMS and N level, with one exception: Small but significant differences in johnsongrass control among cultivars occurred, but control was at least 89% in all cultivars. The POST WMS was as effective in controlling weeds as the PRE + POST WMS. Application of early-season N (35 kg ha^{-1}) had no effect on weed control in the nonirrigated environment.

In the irrigated environment, use of both PRE + POST and POST WMSs in both non-GR and GR cultivars provided effective control of weeds. Control of the predominant weed species at harvest ranged from 92% to 100% among years, with one exception: In 2001, browntop millet control was 82%, and pitted morningglory control was 81%. This reduced control was attributed to the earlier-opening canopy resulting from the early-April planting date in 2001 in conjunction with the August weather that provided a favorable environment for weed emergence and establishment. Among cultivars, WMSs and N levels, differences in control of predominant weed species were not significant, with two exceptions: Small differences in control of browntop millet among cultivars and between WMSs were significant. The difference among cultivars was not associated with any measured trait or observed occurrence. Average control in the PRE + POST WMS (89%) was less than the 95% control in the POST WMS.

SOYBEAN SEED YIELD AND NET RETURN

Non-irrigated. All yields were extremely low as a result of drought stress each year, and all net returns were negative. Soybean seed yield was not significantly affected by N level or WMS. Use of 35 kg N ha^{-1} resulted in negative net returns as a result of the additional cost with no concomitant increase in yield.

Irrigated. Soybean seed yield was not significantly affected by N level in any year. Use of 35 kg N ha^{-1} resulted in smaller average net returns in all years as a result of the additional cost, with no significant yield increase sufficient to offset cost of N.

SUMMARY AND CONCLUSIONS

Application of early-season N to soybeans resulted in more expense, no increase in yield and smaller net returns for both GR and non-GR cultivars grown in non-irrigated and irrigated environments regardless of whether nonglyphosate or glyphosate herbicides were used. Application of early-season N had no effect on weed control in either non-irrigated or irrigated environments. The POST weed management program was as effective in controlling weeds as PRE + POST in both non-GR and GR cultivars. Other researchers have reported that pre-emergent herbicides were not necessary to supplement POST weed management programs in GR soybean for control of common weeds. In the non-irrigated environment, GR cultivars produced slightly greater yields than non-GR cultivars, but the opposite was true in the irrigated environment.

In the non-irrigated environment, all net returns were negative because of extremely low yields resulting from extreme drought stress, and use of early-season N reduced net return even more. In the irrigated environment, non-GR cultivars generally produced greater yield and net return than GR cultivars. Net returns from non-GR cultivars were greater with PRE + POST than with POST WMS in 2 of the 3 years while net returns from GR cultivars were greater with POST than with PRE + POST in all years. Neither glyphosate nor early-season N significantly affected yield of GR cultivars in the POST WMS that received glyphosate compared with nonglyphosate postemergent herbicides in both irrigated and non-irrigated environments. This contrasts with results from a 1-year field study in which the researcher inferred that glyphosate tends to decrease seed yields of GR cultivars grown with limited soil water.

In the present study, early-season N application to soybeans did not benefit yield of either GR or non-GR cultivars and resulted in smaller net returns. These results also indicate that using PRE + POST compared to POST-only weed management with GR cultivars will result in smaller net returns because of the increased cost incurred from using pre-emergent herbicides in conjunction with greater cost for seed of GR cultivars.

Editor's note: *Content was adapted from the paper "Influence of Early-Season Nitrogen and Weed Management on Irrigated and Nonirrigated Glyphosate-Resistant and Susceptible Soybean," which was published in Agronomy Journal, Vol. 95, March-April 2003, and is courtesy of the authors Larry G. Heatherly, Stan R. Spurlock and Krishna N. Reddy.*

Get a CEU!
This exam is worth 1 CEU in **Nutrient Management**. An exam score of 70% or higher will earn CEU credit. The International CCA program has approved self-study CEUs for 20 of the 40 CEUs required in the two-year cycle.

DIRECTIONS
1. Read the self-study article on pages 18-20 carefully.
2. Answer the questions by clearly marking an "X" in the box next to the best answer for each question.
3. Complete the self-study exam registration form on the back of this page.
4. Clip out this self-study examination page, fold and place in envelope.
5. Enclose a check for $10.00 made payable to the American Society of Agronomy, for processing fees. Payment in U.S. funds only.
6. **Mail your self-study exam and fee to:** ASA c/o CCA Self-Study Exam, 677 S. Segoe Road, Madison, WI 53711. *Please allow 60 days for processing.*
7. An electronic version of this test is also available at *www.AgProfessional.com*. Go to the Certified Crop Advisers section (lefthand column) and access the "CCA Advantage" link.

Influence of Early-Season Nitrogen and Weed Management on Glyphosate-Resistant and Susceptible Soybeans

February Self-Study Examination

DETACH HERE

1. Glyphosate is a nonselective herbicide that kills:
[ ] a. selective annual grasses.
[ ] b. selective perennial grasses.
[ ] c. selective broadleaf weeds.
[ ] d. most annual and perennial grasses and broadleaf weeds.

2. Herbicide application timing for adequate weed control:
[ ] a. is of less concern when using glyphosate herbicide.
[ ] b. is of less concern when using non-glyphosate herbicides.
[ ] c. is of more concern when using glyphosate herbicides because of the carryover in the soil.
[ ] d. is of less concern when using nonglyphosate herbicides because of the carryover in the soil.

3. Glyphosate applied to GR soybeans:
[ ] a. enhances nitrogen fixation.
[ ] b. promotes nitrogen fixation.
[ ] c. may interfere with nitrogen fixing bacterium.
[ ] d. shows no effect on nitrogen fixing bacterium.

4. Soybeans grown in most soils:
[ ] a. do not respond to preplant N fertilization.
[ ] b. respond well to preplant N fertilization.
[ ] c. require N fertilization as a necessary expenditure.
[ ] d. respond well to concentrations of N surrounding soybean roots.

5. Field studies were conducted on Sharky:
[ ] a. loam soil.
[ ] b. sandy soil.
[ ] c. clay soil.
[ ] d. silt loam soil.

6. Levels of surface-applied granular ammonium nitrate were:
[ ] a. 0 and 15 kg ha^{-1}.
[ ] b. 0 and 25 kg ha^{-1}.
[ ] c. 0 and 35 kg ha^{-1}.
[ ] d. 0 and 45 kg ha^{-1}.

7. Weed management costs for GR cultivars were:
[ ] a. always more with POST (only glyphosate used) than with PRE + POST (nonglyphosate herbicides used).
[ ] b. always less with POST (only glyphosate used) than with PRE + POST (nonglyphosate herbicides used).
[ ] c. equal when comparing POST (only glyphosate used) and PRE + POST (nonglyphosate herbicides used).
[ ] d. too difficult to determine.

8. In the non-irrigated environment, regardless of cultivar, WMS and N level, control of predominant weed species averaged across years was at least:
[ ] a. 89%.
[ ] b. 91%.
[ ] c. 93%.
[ ] d. 95%.

Over

9. In the irrigated environment, control of the predominant weed species at harvest ranged from:

[ ] a. 89 to 98% with a few exceptions.
[ ] b. 92 to 100% with a few exceptions.
[ ] c. 94 to 100% with a few exceptions.
[ ] d. 96 to 100% with a few exceptions.

10. For both GR and non-GR cultivars grown in non-irrigated and irrigated environments regardless of whether non-glyphosate or glyphosate herbicides were used, application of early-season N to soybeans resulted in:

[ ] a. more expense, increased yields and increased net returns.
[ ] b. less expense, increased yields and increased net returns.
[ ] c. less expense, decreased yields and decreased net returns.
[ ] d. more expense, no increase in yields and smaller net returns.

CCA 1 CEU

SELF-STUDY EXAM REGISTRATION FORM

Name: _____

Address: _____

City: _____ State/Province: _____ Zip: _____

CCA Certification #: _____

Credit Card #: _____ Type of Card: Visa ❑ Mastercard ❑ Discovery ❑ Am Express ❑

Expiration Date _____ Name on Card: _____

Enclose a $10 check payable to American Society of Agronomy.

X _____

Signature of Registrant as it appears on Code of Ethics

I certify that I alone completed this self-study course and recognize that an ethics violation may revoke my CCA status.

This exam issued February 2005 expires February 2008.

DETACH HERE

SELF-STUDY EXAM EVALUATION FORM

Rating Scale: 1=Poor 5=Excellent

Information presented will be useful in my daily crop advising activities: 1 2 3 4 5

Information was organized and logical: 1 2 3 4 5

Graphics/tables were appropriate and enhanced my learning: 1 2 3 4 5

I was stimulated to think how to use and apply the information presented: 1 2 3 4 5

This article addressed the stated competency area and performance objective(s): 1 2 3 4 5

Briefly explain any "1" ratings: _____

Topics you would like to see addressed in future self-study materials: _____