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## Predicting Wheat Straw Yields in Northern Illinois

*Jim Morrison, Extension Educator, Crop Systems, Rockford Extension Center, University of Illinois Extension, 815-397-7714, [morrison@uiuc.edu](mailto:morrison@uiuc.edu)*

A study was conducted in 2004 and 2005 at the Northern Illinois Agronomy Research Center, Shabbona to document straw yields from commonly grown soft red winter wheat varieties and to determine if straw yield from winter wheat in northern Illinois can be predicted.

We measured straw yield of six soft red winter wheat varieties (Cardinal, Growmark FS 634, Kaskaskia, Madison, Pioneer 25R47, and Roane) grown at the Center as part of the University of Illinois wheat grain variety trial.

The previous crop was soybean. The seeding rate was 36 seeds per square foot in 7.5-inch rows. Approximately 40 pounds of nitrogen per acre were applied in the fall and 35 pounds per acre in the spring. Averaged across both years, the seeding and harvest (grain and straw) dates were September 23 and July 11, respectively. A four-inch stubble remained after grain harvest. Straw was hand harvested and weighed immediately after grain harvest.

Results are shown in the following tables and figure.

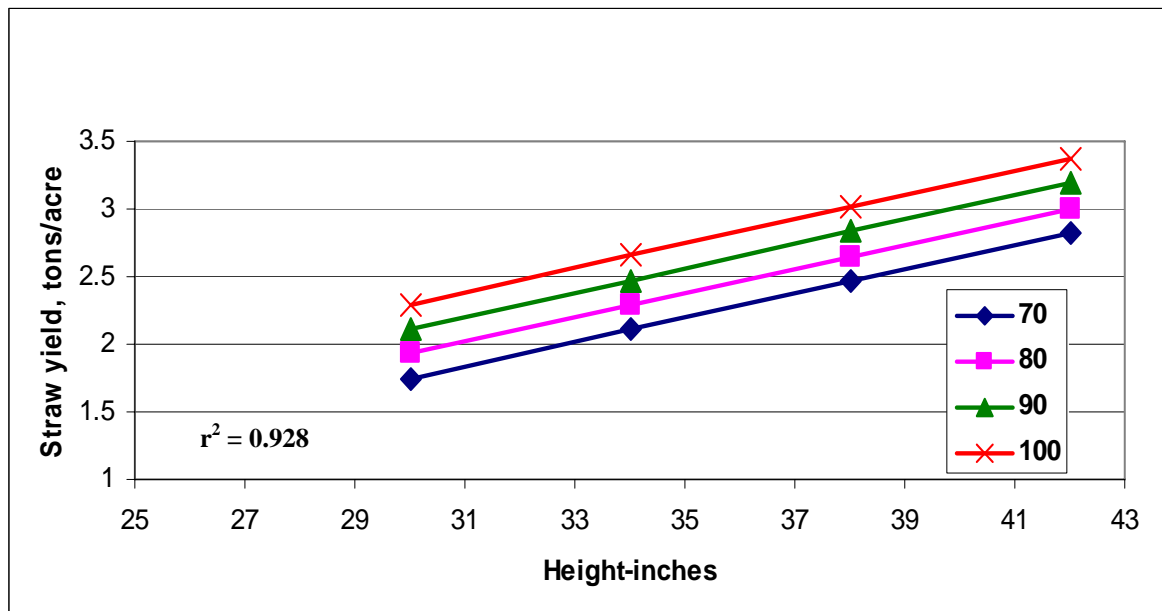
**Table 1.** Straw and grain data from 2004 and 2005.

Variety	Grain, bpa (13.5% moisture)	Straw, t/a (100% DM)	Lb. Straw per Lb. Grain	Plant Height (inches)
Pioneer 25R47	95.8	2.47	0.87	33.7
Cardinal	76.0	2.71	1.20	39.8
Growmark FS634	84.2	2.72	1.08	38.5
Kaskaskia	87.5	3.15	1.21	40.9
Madison	70.1	2.34	1.12	37.2
Roane	80.5	2.28	0.95	32.5
<b>Average</b>	<b>82.4</b>	<b>2.61</b>	<b>1.07</b>	<b>37.1</b>
LSD, 10%	6.4	0.31	0.13	1.5

**Table 2.** Correlations of variables.

Variables	Correlation (r value)
Plant height and grain yield	-0.226
Grain yield and straw yield	0.302
Straw yield and straw:grain	0.659
Plant height and straw yield	0.822
Plant height and straw:grain	0.934

**Figure 1.** Straw yield as a function of grain yield and plant height.



In summary, significant differences existed between varieties in grain and straw yield, and plant height. A negative correlation ( $r = -0.23$ ) existed between plant height and grain yield. A positive correlation ( $r = +0.30$ ) was found between grain yield and straw yield. A high, positive correlation ( $r = +0.82$ ) existed between plant height and straw yield. Straw yield was described by the equation of  $-2.223 + 0.09 \cdot \text{height (inches)} + 0.018 \cdot \text{grain yield (bushels per acre)}$ ;  $r^2 = 0.928$ .

The best way to predict straw yields, at least for high-yielding soft red winter wheat in northern Illinois, was a combination of grain yield and plant height. Collaborators in the study were: Dr. Emerson Nafziger, Extension specialist, and Lyle Paul, agronomist at the Northern Illinois Agronomy Research Center.

## eXtension Provides Solutions to Wildlife Damage

Dan Moser, University of Nebraska, [dmoser3@unl.edu](mailto:dmoser3@unl.edu), (402) 472-3007

Whether it's moles in the lawn, squirrels in the attic, or coyotes terrorizing a neighborhood, consumers now have instant access to research-based solutions for helping humans and wildlife coexist—managing problems caused by wildlife through an online resource dedicated to linking people who need information with the experts who have this information.

The eXtension Wildlife Damage Management Web site puts a wealth of information directly on consumers' computer screens. It's a useful resource for anyone needing information about managing wildlife problems. To take full advantage of the site, register at <http://www.extension.org> and choose "Wildlife Damage Management."

"People need to understand how to resolve or manage problems caused by wildlife with solutions that are humane, ecologically sensitive and responsible, and economically viable. This site is developed to do just that," said Robert Schmidt, associate professor and certified wildlife biologist at Utah State University.

The eXtension Wildlife Damage Management Web site has been developed through the collaboration of nationally recognized wildlife biologists, nuisance wildlife control operators, educators and people interested in the field of human-wildlife relations.

- "The backbone of our site is a series of illustrated pages on 65 wildlife species that cause damage or nuisance problems in North America. We included everything from alligators to polar bears. For each species, you can easily navigate

through life histories, behavior, damage identification, economics, legal issues, and a complete list of methods for managing wildlife damage," said Scott Hygnstrom, professor and extension wildlife damage specialist at the University of Nebraska-Lincoln.

The eXtension Wildlife Damage Management Web site also features the following:

- ◇ Frequently Asked Questions allows users to submit queries about wildlife management.
- ◇ Ask the Expert provides an answer to questions not already available in the Frequently Asked Questions section with a usual response within 24 hours.
- ◇ News and Upcoming Events keeps the news and calendar of events current at the local, state and national levels.
- ◇ Glossary and Diseases list terms and illnesses that are commonly found in wildlife damage management.

"While many sites say this or that technique works, eXtension provides what actually works and it does all this for free. With the public's growing environmental awareness, the need for quality information is more important than ever. Thankfully, eXtension accomplishes this by providing its information 24/7/365," said Stephen Vantassel, nationally certified wildlife control operator and project coordinator at the University of Nebraska-Lincoln.

eXtension is an educational partnership of more than 70 land-grant universities helping Americans improve their lives with access to timely, objective, research-based information and educational opportunities. eXtension's interactive Web site, <http://www.extension.org> is customized with links to local Cooperative Extension Web sites. Land-grant universities were founded on the ideals that higher education should be accessible to all, that the university should teach liberal and practical subjects and share the university's knowledge with people throughout their states.

# Research

## Nitrate and Chloride in the Illinois River Basin

Walt Kelly, Groundwater Geochemist, Center for Groundwater Science

A two-year investigation was conducted to investigate the sources and fate of nitrate (NO<sub>3</sub><sup>-</sup>) and chloride (Cl<sup>-</sup>) in the Illinois River Basin. Water samples were collected on 13 occasions from 14 locations, 9 in the Illinois River, 2 in the Des Plaines River, and 1 each in the Sanitary & Ship Canal, Fox River, and Sangamon River. Samples of potential sources, including treated wastewater (TWW), road salt runoff, precipitation, and tile drain water, were also collected.

Waterways in the Chicago area (i.e., the Des Plaines River and the Sanitary & Ship Canal) had relatively high concentrations of nitrogen species and NO<sub>3</sub>-isotopic data indicative of TWW. Downstream of Chicago, the isotopic signature shifted as increasing amounts of agriculturally derived nitrogen entered the river. The TWW signature was evident downstream at least as far as Pekin during most of the year and to the Mississippi River during low flow. There is isotopic evidence that denitrification is occurring in Peoria Lake during periods of low flow, with about half of the NO<sub>3</sub>-N load lost in August 2005.

Discharge of TWW and road salt runoff in the Chicago area have led to increased levels of Cl<sup>-</sup> in the river. Chloride concentrations in the Illinois River ranged from 40 to 488 mg/L; river water unaffected by human activities would be expected to have concentrations ≤ 15 mg/L. Chloride concentrations in river water spiked during the late winter and early spring as a result of road salt runoff, primarily in the Chicago region. A large component of Cl<sup>-</sup> in the Illinois River throughout the year was attributed to TWW from the Chicago area. Agricultural activities which dominate land use in the watershed downstream from Chicago appear to be primarily causing dilution of road salt and TWW.

Chloride concentrations in the Illinois River at Peoria have been increasing with time; the annual median increased from about 20 mg/L in 1946 to near 100 mg/L in 2005. While median Cl<sup>-</sup> concentrations are well below the secondary drinking water standard (250 mg/L), periodic spikes (maximum measured in 2003 was 904 mg/L) may be harmful to freshwater biota.

## Plant-herbivore Interactions and the Omics-es: The Future of Hyphenated Research?

May Berenbaum, Ph.D., Professor and Head of the Department of Entomology, University of Illinois

Appearances notwithstanding, insects actually do have a few things in common with humans; among these is an appetite for, and dependence upon, plants as food. The ways in which insects and humans go about the business of eating plants, however, differ dramatically.

Humans are spectacularly broad with respect to their intake of plant food; in a single day, a person can consume representatives of dozens of plant families. In contrast, insects are staggeringly narrow in their food plant choices; over 90% of all herbivorous insects feed on 3 or fewer plant families and in many species larval development is completed on a single species. Insects do share with humans an ability to metabolize plant toxins via cytochrome P450 monooxygenases, heme-based enzymes that are responsible for a broad range of oxidative reactions.

The dietary challenges imposed on insect P450s are fundamentally different from the dietary challenges imposed on human and other vertebrate P450s. Genome sequencing has provided an embarrassment of riches with respect to P450 inventories of both insects and plants; elucidating function, while presenting daunting operational challenges, promises to provide new insights into the process by which plant-feeding insects have come to be the most abundant multicellular organisms in terrestrial ecosystems

# Resources

## Publications Plus –University of Illinois Agricultural and Horticultural Publications

Call 1-800-345-6087 or order on the web

[www.PublicationsPlus.uiuc.edu](http://www.PublicationsPlus.uiuc.edu) It's a one-stop shop for a current catalog of research-based information (Mastercard and VISA accepted)

- Creating Habitats and Homes for Illinois Wildlife, DNR01, \$25.
- Planning a Construction Project, U3051b, \$3.60.

## Preserving Old Barns

*John Porter, Univ. New Hampshire, Cooperative Extension dairy specialist, and Francis Gilman, retired agricultural engineer specialist, UNH Coop Extension*  
<http://extension.unh.edu/Pubs/Pubs.htm>

A unique resource on preserving old barns is now available in an illustrated book featuring many of New Hampshire's historic and scenic barns. It deals with structural renovation of deteriorating farm buildings. This book will help barn owners assess the structural integrity of old farm buildings, as well as provide instructions for some basic repairs. To order please call University of New Hampshire Publications office, Holly Young at (603) 862-1564

# Internet Resources

## Optimum Crop Productivity Ratings for Illinois Soils Bulletin 811

[www.nres.uiuc.edu/soilproductivity](http://www.nres.uiuc.edu/soilproductivity).

This important bulletin listing the Crop Productivity ratings for soils of Illinois has recently been updated.

## Environmental Credit Trading: Can Farming Benefit?

<http://www.ers.usda.gov/AmberWaves/May07SpecialIssue/Features/Environmental.htm>

Environmental credit trading is a market-based approach to complying with regulations with the potential to achieve pollution abatement goals at least cost to society. Agriculture can contribute to credit trading programs by generating pollution-reduction credits through the adoption of environmentally preferred practices and selling the credits to regulated firms.

Rural Route 2  
is Available at  
1-800-468-1834

<http://www.extension.uiuc.edu/ruralroute/>



The Rural Route 2 service is designed to help farm families get through tough times. This **confidential service** provides referrals for farm business and family financial advice; helps manage economic as well as personal situations; helps locate local support; and identifies assistance through the Illinois Farm Development Authority.

## Education Opportunities

### University of Illinois Agriculture Events

New programs are being confirmed every day. Keep in touch with your Extension Office for programs addressing the topics that interest you and are offered in your County. To find your counties website go to:

<http://web.extension.uiuc.edu/state/findoffice.html>

### Statewide University of Illinois Extension Calendar Website

<http://web.extension.uiuc.edu/state/calendar.cfm>

To search for programs throughout the state, check out Extension's searchable calendar. Search by location, topic or date to find a program of your interest.

## **Ethanol Reshapes the Corn Market**

<http://www.ers.usda.gov/AmberWaves/May07SpecialIssue/Features/Ethanol.htm>

This article examines the possible market impacts of the ongoing expansion of the U.S. ethanol sector. To meet the sector's growing demand for corn, some U.S. corn is likely to be diverted from exports and feed. In the future, corn may cease to be the main feedstock for U.S. ethanol production if cellulosic biomass is successfully developed as an alternative.

## **Farmer's Guide to Agriculture and Water Quality Web Site**

<http://www.cals.ncsu.edu/wq/wqp>

Many agricultural producers may not appreciate how their actions affect water quality, nor are they fully aware of what environmental requirements apply to them, what actions they can take to meet those requirements, and what incentive programs are available to them. North Carolina State University, in partnership with NC A&T State University, Cornell University, California Polytechnic University, Purdue University, University of North Carolina at Chapel Hill, US EPA, USDA-CSREES, and Ice. Nine Environmental Consulting, has developed an educational resource for agricultural producers and agricultural service professionals to help them:

This resource is presented in the form of a web site containing extensive information, as well as links to additional detailed information. Printable fact sheets that summarize major points are available for use in other settings. The website material is national in scope. Much of the content is available in Spanish, as well as English.

There are five major water quality focus areas:

- Erosion and sediment control;
- Nutrient management;
- Pesticides;
- Pathogens; and
- Wetlands and riparian area protection.

## **The Earth Portal**

[http://www.earthportal.org/?page\\_id=2](http://www.earthportal.org/?page_id=2)

The Earth Portal is a comprehensive resource for timely, objective, science-based information about the environment. It is a means for the global scientific community to come together to produce the first free, expert-driven, massively scaleable information resource on the environment, and to engage civil society in a public dialogue on the role of environmental issues in human affairs. It contains no commercial advertising and reaches a large global audience.

## **About the Ag Update Newsletter**

The Ag Update Newsletter is a bi-monthly newsletter providing education and research support to the agricultural industry. Current and past issues may be found at the following website  
<http://www.urbanext.uiuc.edu/agupdate/index.html>

Contact your county Extension office and request to be put on their agricultural mailing list to receive the local agricultural newsletter and notices about upcoming agricultural events near you. To find your counties location, phone and website go to <http://web.aces.uiuc.edu/ve/>

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