6-1983

Agricultural Experiment Station News June 1983

THE AGRICULTURAL EXPERIMENT STATION
INSTITUTE OF AGRICULTURE
AND NATURAL RESOURCES
UNIVERSITY OF NEBRASKA-LINCOLN 68583-0704

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June 1983 VOL 16 NO 9

PROJECT ACCOMPLISHMENTS

David T. Lewis, Professor of Agronomy. Project: **Soil Minerals, Chemical and Physical Properties as Related to Genesis, Classification and Mapping.** Completed work shows differences in potential fertility and water holding capacity of soils formed under prairie grasses and those formed under forests, and how salts got into some salty soils in the Platte River Valley. Differences in moisture relationships within map units of certain soils suggest a more precise sampling method to determine soil moisture and to predict where areas of shortage will be most likely to develop. Potential water loss under center pivot on clayey sloping soils has been measured in order to predict how well these kinds of soil will respond to sprinkler irrigation. A technique to control wind erosion on sandy range land map units, and one to determine amount of soil that has moved from the land and entered stream systems as non point pollution has been developed.

J. David Aiken, Water Law Specialist and Associate Professor of Agricultural Economics. Project: **Legal-Institutional Arrangements Affecting Water Development, Use, and Management.** *Ground Water Depletion:* Nebraska ground water law does not require ground water regulation when ground water supplies are being depleted. State policy amounts to a tacit policy of condoning unplanned ground water depletion. State policy should be changed to require mandatory regulations where depletion is occurring.

Ground Water Recharge: Surface and ground water law must be modified (1) to give rechargers legal authority to control withdrawals of recharged ground water, (2) to allow existing surface water appropriations to be modified to reflect the occurrence of recharge, and (3) to authorize recharge surface water appropriations.

Riparian Rights: Court decisions indicate that riparian rights will be favored only in limited circumstances. If legislation integrating riparian rights is desired, it should follow (not precede) legislation (1) establishing instream flow appropriations, (2) clarifying the legal status of instream stockwatering, and (3) resolving surface-ground water conflicts.

Surface-Ground Water Conflicts: The Nebraska Supreme Court or Legislature should acknowledge that surface and ground water supplies often are physically interrelated by adopting the subflow and tributary ground water doctrines.

Earl W. Gleaves, Professor and Extension Agriculturalist in Animal Science. Project: **Food Intake Regulators and Nutrient Requirements of Laying Hens.** Losses due to cracked and broken egg shells ($10,000,000 annually) stimulated further study of calcium needs and utilization in the laying hen. Results of this research work revealed that with properly balanced rations, as much as 7-8% calcium can be fed to layers without affecting egg production. Even though this much calcium improved egg shell quality only slightly, it is clear that the traditional 3.5% is not enough calcium and that 4.5% is more nearly correct. Several experiments showed that low levels of dietary lactose (1%) improved calcium utilization and egg shell quality.

John Schmidt, Professor of Agronomy. Project: **Genetics, Breeding and Evaluation of Common Wheats, Durums, and Triticales for Nebraska.** Winter wheat variety development has been a prime objective of this project. Since 1978, five varieties have been developed and released—Centurk 78, Bennett, Brule, Centura and Colt. Populations of winter durum and winter triticales were developed which may provide lines for future on-farm production. Two studies on the role and interaction of yield components in wheat were completed and one on hybrid wheat started. Other studies are providing information on the inheritance and potential of increased grain protein content in wheat; inheritance of resistance to Septoria glume blotch; seed size in determining rates of seeding for optimum yield.

C. Dean Yonts, Instructor, Ag Engineering. Project: **Design and Use of Irrigation Systems.** Effects of silt laden water on performance of the canal systems in the North Platte Valley. Artificially induced sediment laden water in the Interstate canal system reduced seepage substantially in one out of the four years tested. Data from the other years indicated a smaller reduction in losses usually occur. Silt laden water was effective in increasing the advance times in furrow irrigation, improving irrigation efficiency.

ASSOCIATE DIRECTOR POSITION

The Search Committee for the Associate Director has conducted initial screening of applications. Application folders for those in the top group are being completed. Committee plans to meet later in June and hopes to complete the review by early July.

UNIVERSITY OF NEBRASKA FOUNDATION GRANT REQUESTS

Grant requests are due at Regents Hall in late August for review by the Foundation Committee in early September. In anticipation of a call from UNL for proposals to be submitted earlier in August you may want to consider a response which may have a short time frame when guidelines are issued.

ADVISORY COUNCIL ELECTION RESULTS

As a result of the elections within each of the districts, the following persons were elected to serve on the Advisory Council effective July 1, 1983:

District 3	Agronomy	**Gary A. Peterson**
District 4	CAMaC, Entomology, Environmental Programs, Horticulture	**Blaine L. Blad**
District 7	Ag. Biochemistry, Plant Pathology	**James R. Steadman**
District 8	Ag. Communications, Ag. Education, Education & Family Resources, Human Development & the Family, Human Nutrition & Food Service Management, and Textiles, Clothing and Design	**Patricia K. Knaub**
District 9	North Platte Station, Panhandle Station	**Robert G. Wilson, Jr.**

Dale G. Anderson is the current Chairman of the Advisory Council. Faculty are encouraged to visit with their representative regarding issues of importance to the Agricultural Experiment Station. The Council normally meets at least quarterly unless a special meeting is called by the Council Chairman, the Experiment Station Director, or the majority of the Council members.

Other members on the AES Advisory Council for 1983-84 include: **Dale Anderson** (Ag Econ.); **Khem Shahani** (Food Science and Technology); **James Gilley** (Ag. Engineering); **Austin Lewis** (Animal Science) and **Marvin Rhodes** (Veterinary Science).

AES BUDGET REDUCTIONS

Unfortunately, the 2% budget reduction levied by the Legislature last November becomes permanent on July 1, 1983 without any offsetting increases in State appropriations for 1983-84 agricultural research. This reduction, in addition to our beginning 1982-83 with a $266,119 over-budget, forced us to freeze or eliminate several positions to partially accommodate this reduction at the Division level. However, the remainder of the reductions had to come out of budgets from individual administrative units on a priority basis. Unit administrators were given as much flexibility as possible in making their reductions in an effort to minimize the adverse impact on their research programs.

Maintaining our quality research programs depends on each of us more aggressively seeking outside support for our programs and our reallocation of the limited resources available to the highest priority programs. We hope that 1984-85 will mark the beginning for program rebuilding.

TWELVE HIGHEST AGRICULTURAL RESEARCH PRIORITIES FOR SPECIAL, ADDED EMPHASIS IN THE NORTH CENTRAL REGION - 1983

Here are the highest priority research program needs based on surveys submitted by each of the North Central States. Compiled by **Keith Huston,** Director-at-Large.

1. Maintain capacity of state and federal research organizations to respond to newly emerging and changing research needs of agriculture, as appropriate to the mission of the organization.
2. Soil-conserving crop production systems that are economically attractive and water and energy conserving.
3. Genetic manipulation and germplasm resource enhancement to improve productivity of plants, including classical cultivar and varietal development, recombinant DNA, genetic engineering, and biotechnology.
4. Genetic manipulation and biotechnology to improve animal productivity.
5. Improving foreign trade opportunities for U. S. agricultural products in a changing world economy.
6. Upgrading and modernization of laboratory equipment.
7. More efficient management of surface and ground waters, including irrigation, drainage, and quality; regional modeling, water control, and allocation.
8. Improving human health and well being through improved nutrition and family resource management.
9. Controlling livestock diseases with particular emphasis on stress, respiratory, and enteric diseases.
10. New technologies to improve quality, safety, and nutritional value of foods, especially animal products.
11. IPM and biological control of pests and diseases including (a) resistant varieties, (b) lessened energy and chemical inputs, and (c) improved management systems.
12. IRM and reproductive physiology, particularly for beef cattle and swine.

DEPARTMENT HEADS APPOINTED

Elton D. Aberle will become Head of the Animal Science Department on August 1, 1983. Dr. Aberle is currently a Professor of Animal Science at Purdue University.

Lowell D. Satterlee will become Head of the Food Science and Technology Department on July 1, 1983. Dr. Satterlee is currently Interim Head and Professor of Food Science at UNL.

R. Gene White will serve as Interim Head of the Department of Veterinary Science effective July 1, 1983, in addition to his present position as Program Coordinator for the Regional College of Veterinary Medicine Program.

CONGRESSIONAL AGRICULTURAL RESEARCH FAIR

The Nebraska Agricultural Experiment Station was one of 18 Stations participating in a Congressional Agricultural Research Fair, May 4 on Capitol Hill, under sponsorship of the House Agriculture Committee. In addition to the 18 state station exhibits there were three by the USDA and one by the 1890 Land Grant Universities. The Nebraska exhibit featuring "Conservation Tillage" was developed by **Elbert Dickey** and **Bart Stewart** and their good work did us great credit in being identified in the top five. The target audience was House and Senate members and their staffs.

GRANTS AND CONTRACTS

Anderson, B. E. (Agronomy) - Anna H. Elliott Fund - UN Foundation	7,600
Ball, E. M. (Plant Pathology) - Idaho Crop Improvement Association, Inc.	280
Ball, E. M. (Plant Pathology) - California Food & Agriculture	50
Ball, H. (Entomology) - Ciba Geigy Corporation	500
Burnside, O. C. (Agronomy) - Monsanto Corporation	5,000
Burnside, O. C. (Agronomy) - BASF Wyandotte Corporation	1,000
Burnside, O. C. (Agronomy) - E. I. DuPont deNemours & Company	1,800
Burnside, O. C. (Agronomy) - Chevron Chemical Company	1,500
Burnside, O. C. (Agronomy) - Stauffer Chemical Company	1,750
Burnside, O. C. (Agronomy) - Shell Development Company	1,000
Campbell, J. B. (North Platte Station) - University of Missouri	22,100
Campbell, J. B. (North Platte Station) - Shell Development Company	500
Chollet, R. (Ag Biochemistry) - U. S. Department of Energy	53,949
Deutscher, G. H. (North Platte Station) - The Upjohn Company	2,500
Dickason, E. A. (Entomology) - Chevron Chemical Company	1,000
Flowerday, A. D. (Agronomy) - BASF Wyandotte Corporation	500
Gardner, C. O. (Agronomy) - The Popcorn Institute	17,000
Gold, R. E. (Environmental Programs) - USDA/SEA	14,787
Gold, R. E. (Environmental Programs) - BFC Chemicals, Inc.	500
Grabouski, P. (North Platte Station) - Dow Chemical Company	1,500
Holtzer, T. O. (Entomology) - Chevron Chemical Company	500
Mandigo, R. W. (Animal Science) - Nebraska Pork Producers Association	4,950
Maranville, J. W. (Agronomy) - INTSORMIL	586
Martin, A. R. (Agronomy) - BASF Wyandotte Corporation	700
Martin, A. R. (Agronomy) - E. I. DuPont deNemours & Company	750
Martin, A. R. (Agronomy) - Stauffer Chemical Company	1,500
Martin A. R. (Agronomy) - Shell Development Company	500
Mayo, Z. B. (Entomology) - BASF Wyandotte Corporation	750
Mayo, Z. B. (Entomology) - California Nematode Lab	1,200
Moomaw, R. (Northeast Station) - Chevron Chemical Company	800
Moomaw, R. (Northeast Station) - Shell Development Company	2,500
Moomaw, R. (Northeast Station) - Eli Lilly and Company	1,500
Moomaw, R. (Northeast Station) - BASF Wyandotte Corporation	700
Moomaw, R. (Northeast Station) - Velsicol Chemical Company	500
Nelson, L. A. (Panhandle Station) - Shell Development Company	1,000
Olson, R. A. (Agronomy) - Phillips Chemical Company	6,000
Omtvedt, I. T. (Dean & Directors Office) - USDA/CSRS	10,607
Omtvedt, I. T. (Dean & Directors Office) - USDA/SEA/CR	66,347
Partridge, J. E. (Plant Pathology) - Stauffer Chemical Company	15,000
Roeth, F. W. (South Central Station) - Monsanto Corporation	2,000
Roeth, F. W. (South Central Station) - Velsicol Chemical Corporation	500
Roeth, F. W. (South Central Station) - BASF Wyandotte Corporation	3,200
Roeth, F. W. (South Central Station) - Chevron Chemical Company	1,000
Roeth, F. W. (South Central Station) - Stauffer Chemical	1,750
Roeth, F. W. (South Central Station) - Shell Development Company	500
Roeth, F. W. (South Central Station) - E. I. DuPont deNemours & Company	1,400
Sander, D. H. (Agronomy) - Potash and Phosphate Institute	8,500
Shea, P. J. (Agronomy) - Monsanto Corporation	900
Shea, P. J. (Agronomy) - Nelson Research	500
Shea, P. J. (Agronomy) - E. I. DuPont deNemours & Company	1,700
Shearman, R. C. (Horticulture) - Eli Lilly Company	1,500
Shearman, R. C. (Horticulture) - Diamond Shamrock	2,100
Shearman, R. C. (Horticulture) - Monsanto	4,000
Shearman, R. C. (Horticulture) - UN Foundation	4,000
Steadman, J. R. (Plant Pathology) - Diamond Shamrock	2,000
Stubbendieck, James (Agronomy) - Eli Lilly and Company	1,000
Swisher, B. A. (Agronomy) - Monsanto Corporation	1,000
Swisher, B. A. (Agronomy) - E. I. DuPont deNemours & Company	1,700
Vidaver, A. K. (Plant Pathology) - Potash & Phosphate Institute	2,000
Watkins, J. E. (Plant Pathology) - Diamond Shamrock	750
Wicks, G. A. (North Platte Station) - BASF Wyandotte Corporation	500
Wicks, G. A. (North Platte Station) - Ciba-Geigy	1,000
Wicks, G. A. (North Platte Station) - Diamond Shamrock	2,000
Wicks, G. A. (North Platte Station) - Velsicol Chemical	1,000
Wicks, G. A. (North Platte Station) - Stauffer Chemical	750
Wicks, G. A. (North Platte Station) - Shell Development Company	2,500
Wicks, G. A. (North Platte Station) - Chevron Chemical Company	2,000
Wilson, R. G. (Panhandle Station) - Velsicol Chemical Company	3,500
Wilson, R. G. (Panhandle Station) - Nor-Am Agri Products	500
Wilson, R. G. (Panhandle Station) - Shell Development Company	1,000
Wilson, R. G. (Panhandle Station) - BASF Wyandotte Corporation	700
Wilson, R. G. (Panhandle Station) - Chevron Chemical Company	1,000
Wilson, R. G. (Panhandle Station) - Shell Development Company	1,000
Wilson, R. G. (Panhandle Station) - Stauffer Chemical Company	2,900
Witkowski, J. F. (Northeast Station) - Shell Development Company	1,200
Yonts, C. D. (Panhandle Station) - Anna H. Elliott Fund	6,100
	320,856

RESEARCH "ALIVE AND WELL" AT GUDMUNDSEN CENTER

Great strides have been made in the development of the Gudmundsen Sandhills Research Center north of Whitman this past year, and physical changes have enhanced significantly several important research projects.

Under the coordination of **Donald C. Clanton** of the North Platte Station, the team of researchers from North Platte, the Panhandle Station and the UNL East Campus was instrumental in the installation of additional water systems, road improvement and the construction of miles of fencing. This permitted the carrying out of various experiments relating to range and livestock production, management, economics and animal health.

The largest project among those being conducted by Experiment Station staff is a breeding study involving more than 400 cows. This and other studies have been aided by the completion of a cattle handling facility, the first significant new construction at the Center.

Other projects in progress include a series of range management studies, control of internal and external parasites of beef cattle, winter supplement trials, feeding of ear corn, a herd health surveillance program and an economic, long-range study of breeding systems and range cattle production.

A proposed long range plan for the Center, which came under IANR management in 1981, has been developed by Institute staff and submitted to Vice Chancellor Arnold, in line with the objective of developing "a center of excellence for research and education in the fields of range and cattle management" under Sandhills conditions.

EXPERIMENT STATION PROJECT ACCOMPLISHMENTS

A brief summary of project accomplishments is to accompany requests for peer reviews for projects scheduled for revision, or to replace projects that are ending. These summaries will be used by the Department of Ag Communications for news releases and serve as background information for the review panel. To avoid delays in scheduling reviews, project leaders should provide their unit administrators with these summaries at the same time project outlines are submitted.