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Agricultural Experiment Station News October 1982

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

Agricultural Experiment Station News

October 1982 VOL 16 NO 3

FROM THE DIRECTOR'S DESK

Grants, Contracts and Cooperative Agreements - FY 1982

The initiatives and effectiveness of AES scientists in the procurement of outside support for their research program have been very impressive. Such support is increasingly important to our programs. The amount of grant and contract activity has increased greatly in recent years for all UNL. The IANR component has kept pace as a major component as illustrated by the following data for FY 1982.

	UNL Total	IANR Component	IANR %
Instruction	$ 2,210,322	not separable	
Student aid	5,368,681	not separable	
Public service	5,956,808	$3,198,943	53.7%
Research:			
Competitive	15,639,681	8,462,925	54.1%
Industry	853,108	747,198	87.5%
Foundation	592,024	126,291	21.3%
Other	970,719	631,824	65.1%
Research totals	$18,055,532	$9,968,238	55.2%
Number of awards	1,054	581	55.1%

New AES Leadership

The Nebraska Agricultural Experiment Station has many good things going for it as it continues its long record of service to the state and nation: a particularly capable and committed staff, outstanding support of clientele, effective departmental administrators, excellent collaborative relationship with teaching and extension, the IANR organizational structure, the district stations, and effective cooperation with the USDA. Our good fortune continues with Dr. Irv Omtvedt taking over as Dean and Director. We could not be more pleased with this outcome of the search and screening process and subsequent administrative actions. We pledge our enthusiastic support and cooperation.

A wide array of factors impinging upon the how and what of agricultural research is continuing at an accelerating rate. This is caused substantially by our own accomplishments, but it dictates a need for dynamic adjustments in our programming. Dr. Omtvedt has a proven record of ability to provide leadership to this process. Congratulations to both Dr. Omtvedt and to the AES on this match-up of ability with need and opportunity.

R. W. Kleis
Associate Director

SAHS SEZ

The Field Laboratory has contracted with the Nebraska Penal Complex for eight trustees to work at the Field Laboratory. We are pleased that they are productive workers and are busy on demolition, painting and general clean-up projects. This reflects the need to furnish employment to confined individuals, as recently featured in Time magazine.

Warren W. Sahs
Assistant Director

EXPERIMENT STATION SEMINAR

The Experiment Station Advisory Council has arranged a special seminar featuring Dr. Nelson R. Otto, President of Anticipatory Sciences, Inc., Minneapolis, Minnesota. The topic of the seminar will be "Impact of Future Agricultural Technologies on Rural Lifestyles". The seminar will be held on November 11th at 4:00 p.m. in the East Union. All IANR staff are invited.

Dale Anderson, Chairman
Ag. Experiment Station Advisory Council

INSTRUMENT REPAIR SERVICE

Lab Research Products has expanded its services available to the university to include interfacing of computers and scientific instrumentation and the design and fabrication of scientific apparatus for use in laboratory investigations which is not normally available from a commercial source. In addition to repairing normal laboratory equipment, we service microscopes and lab balances, including electronic units. Our repair shop, located on the east side of Ag. Biochemistry, 123 ABH, is open from 8:00 to 5:00, Monday through Friday. The phone number at the shop is 472-6866. If there is no answer, please call 472-9020 to leave a message with our

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answering service.

Larry R. Prather

NEW AND REVISED PROJECTS

NEB 10-071 - Effect of Changes in Transportation on Performance of the U.S. Agricultural Transportation System

This is a revised Hatch project that contributes to regional project NC-137 with an effective date of October 1, 1982. The principal investigator is D. G. Anderson of the Agricultural Economics Department. The objectives of this research are to (a) evaluate the major determinants of transportation rates for agriculture, including the effects of carrier costs, competition among and within modes, and changes in regulatory status; (b) evaluate the effects of changes in rate determinants on the performance of the transportation system and users of agricultural transportation services; and (c) evaluate the distribution of benefits and costs of alternative transportation policies, including user charges, taxation and subsidy, investment/disinvestment in transportation, and public and private ownership.

NEB 12-049 - Quantitative Genetic Investigations in Plants

This is a revised Hatch project with an effective date of July 26, 1982. C. O. Gardner and M. Thomas-Compton of the Agronomy Department are the principal investigators. The objectives of the research are 1) to utilize genetic modeling, computer simulation, theoretical mathematical and statistical approaches, and field, greenhouse, growth chamber, and laboratory experiments to obtain information on gene effects controlling quantitative traits; 2) to use allozymes as marker genes to determine genetic variability, level of inbreeding and mating system in populations, particularly in recurrent selection programs and in germplasm pools; 3) to examine allozyme patterns in relation to morphological, physiological and biochemical quantitative traits; 4) to study exotic germplasm utilization in relation to population improvement, rate of gains, and selection limits; and, 5) to study population improvement systems using different selection criteria and different systems of breeding.

NEB 12-070 - Seed Production of Breeding Lines of Insect-Pollinated Legumes

This is a revised Hatch project with an effective date of October 1, 1982 that contributes to regional project NC-83. W. R. Kehr of the Agronomy Department is the project leader. The objectives of the research are to evaluate seed production of parental materials and populations and select for seed yield within populations; produce seed of experimental combinations and use for forage yield and other cooperative tests; produce seed of recurrent selection populations for use in cooperative regional research projects and produce seed of gene pools to preserve germplasm.

NEB 12-128 - Relating Soil Wetness to Selected Soil and Landscape Features and to Land Use Decisions

This is a new Hatch project with an effective date of October 1, 1982 that contributes to NC-109. David T. Lewis of the Agronomy Department is the principal investigator. The objectives of the research are to establish criteria that more accurately predict presence and duration of saturation in soils of the North Central Region and to use the developed criteria to more precisely classify the soils and more accurately predict hazards of various land uses.

NEB 12-129 - Physical Factors Controlling Microbial Aspects of Movement and Transformation of Solutes in Soils

This is a new Hatch project with an effective date of July 27, 1982. Joseph Skopp of the Agronomy Department is the project leader. The objectives of the research are to a) describe the movment of gases within an aggregated soil containing actively respiring microorganisms; b) determine the physical conditions (temperature, compaction, water content, aggregation, hydraulic conductivity) under which oxygen becomes limiting; c) describe the simultaneous movement of solutes within a soil profile and the uptake of nutrients by microorganisms; d) evaluate the importance of passive microbial movement on patterns of microbial growth, activity and competition and e) apply the concepts developed above to examine the interaction of physical and microbial processes in controlling nitrogen levels in field soils.

NEB 13-041R - Improving Dairy Cattle Through Breeding, with Special Emphasis on Selection

This is a revised Hatch project with an effective date of October 1, 1982 that contributes to regional project NC-2. The project leader is Franklin Eldridge of the Animal Science Department. The objectives of the study are to investigate the inheritance of physical and psychological abnormalities in livestock, the cytological basis of these abnormalities, and how these abnormalities may influence selection decisions.

NEB 13-064 - Pork Carcass Evaluation

This is a new Hatch project with an effective date of July 1, 1982. The project investigators are W. T. Ahlschwede, R. K. Johnson and R. Mandigo of the Animal Science Department. The objectives of the study are to a) develop improved carcass lean estimation procedures based on carcass measurements which would protect carcass integrity and enhance accuracy of prediction; b) determine if genetic groups (biological types) of market hogs differ in yield and study the relationship of yield with other carcass attributes; and c) determine if genetic groups of pigs which are different in backfat thickness and length vary in distribution of fat and lean in the carcass.

NEB 13-065 - Factors Affecting Acidosis in Ruminants

This is a new Hatch project with an effective date of July 1, 1982. R. Britton, D. Brink and T. Klopfenstein of the Animal Science Department are the project leaders. The objectives of the research are to a) measure the factors affecting microbial production and metabolism of lactate and other organic acids and subsequent absorption and metabolism by the host animal; and b) to find methods of enhancing microbial adaptation to high grain diets.

NEB 14-009 - Prevention and Control of Enteric Diseases of Swine

This is a revised Hatch project with an effective date of October 1, 1982 that contributes to NC-62. The principal investigators are N. R. Underdahl, A. Torres-Medina and E. O. Dickinson of the Veterinary Science Department. The objectives of the research are as follows: *Transmissible gastroenteritis* 1b. Develop more rapid, sensitive and accurate diagnostic procedures. *Rotavirus diarrhea* 2a. Define role of rotavirus in the diarrhea syndrome; and study pathogenesis in conventional and gnotobiotic pigs. 2b) Characterize and determine the serologic, biologic and pathogenic differences among porcine rotaviral isolates from swine in the North Central region. 2c) Improve diagnostic procedures. *Newly recognized enteric diseases of swine.* 3a) Determine the incidence of naturally occurring infections by newly recognized enteropathogens.

NEB 15-022 - Cellular Photosynthetic Processes and the Regulation of Photosynthesis

This is a revised Hatch project that contributes to regional project NC-142 with an effective date of October 1, 1982. The principal investigator is R. Chollet of the Agricultural Biochemistry Department. The objectives of this study are to determine the regulation of photosynthetic CO_2 fixation, the metabolic flow of carbon, and influence of photorespiration on the cellular carbon economy of agronomic plants and to determine the genetic control of photosynthesis and photorespiration in C_3, C_4, and intermediate C_3-C_4 species.

NEB 21-003 - Detection and Control of Virus Diseases in Nebraska

This is a revised Hatch project with an effective date of July 8, 1982. L. C. Lane of the Plant Pathology Department is the project leader. The objectives of the research are to improve biophysical diagnostic procedures so they can identify low concentration viruses; determine factors which affect the physical stability of maize chlorotic mottle virus; determine the biological significance of the different protein forms of wheat streak mosaic virus and improve methods for producing highly infectious inoculum of maize dwarf mosaic virus.

NEB 21-033 - Identification of Genes Controlling Reaction of Sorghum to MDMV

This is a new State project effective July 1, 1982. S. G. Jensen of the Plant Pathology Department is the principal investigator. The objectives of the research are to describe the host genotypes that control the reaction of sorghum and millet to the major strains of sorghum viruses; identify the different genes and the potential breeding lines that can be used to impart resistance to the major strains of sorghum viruses and determine genetic linkages between genes for resistance to these sorghum viruses.

NEB 44-027 - Cultural and Nutrient Investigation for Crops of Western Nebraska

This is a new Hatch project with an effective date of August 5, 1982. Frank N. Anderson of the Panhandle Station is the project leader. The objectives of the research are to a) determine N, P, K and Trace element needs for crops grown in western Nebraska, b) test soil management for production increase with: crop residues, cover crops, crust inhibitors and methods to be developed, c) evaluate various cultural practices and d) study management of newly irrigated soils.

GRANTS AND CONTRACTS

Ball, H. J. (Entomology) - Mobay Chemical Corporation	1,000
Ball, H. J. (Entomology) - Stauffer Chemical Company	750
Blad, B. L. (Ag Meteorology & Climatology) and Norman, J. M. (Agronomy) - NASA-Johnson Space Center	90,000
Burnside, O. C. (Agronomy) - Stauffer Chemical Company	2,800
Burnside, O. C. (Agronomy) - American Cyanamid	400
Burnside, O. C. (Agronomy) - Donation/Gift - Stauffer Chemical Company	10,928
Campbell, J. B. (North Platte Station) - USDA/ARS	39,800
Coyne, D. P. (Horticulture) - Michigan State University	125,699
Daly, J. M. (Ag Biochemistry) - USDA/SEA	92,000
Danielson, D. M. (North Platte Station) - Western Alfalfa Corporation	3,600
Dickason, E. A. (Entomology) - BFC Chemicals, Inc.	500
Dickason, E. A. (Entomology) - Union Carbide	1,300
Dickason, E. A. (Entomology) - Rhone-Poulenc	1,000
Eldridge, F. (Animal Science) - Jennifer L. Sweebe	80
Fischbach, P. E. (Ag Engineering) - Stauffer Chemical-UN Foundation	500
Grabouski, P. H. (North Platte Station) - The Dow Chemical Company	500
Johnson, R. K. (Animal Science) - Union Pacific	4,000
Kelling, C. L. (Vet Science) - Union Pacific Foundation	7,988
Klock, N. L. (North Platte Station) - Stauffer Chemical Company	1,000
Klopfenstein, T. (Animal Science) - Eli Lilly and Company	18,000
Klopfenstein, T. (Animal Science) - Hoffmann-La Roche	13,000
Mandigo, R. W. (Animal Science) - Layman Fund	5,000
Martin, A. (Agronomy) - Stauffer Chemical Company	1,500
Martin, A. (Agronomy) - American Cyanamid Company	400
Mattern, P. J. (Agronomy) - Anna H. Elliott Fund	5,000
Mayo, Z. B. (Entomology) - Stauffer Chemical Company	1,500
Mayo, Z. B. (Entomology) - American Cyanamid Company	1,000
Moomaw, R. (Northeast Station) - American Cyanamid Company	400
Nichols, J. T. (North Platte Station) - Donation/Gift - Allied Chemical	2,078
Nordquist, P. T. (North Platte Station) - Miscellaneous Donors	420
Norman, J. M. (Agronomy) - National Aeronautics & Space Administration	34,947
O'Keefe, R. B. (Panhandle Station) - Anna H. Elliott Fund	6,500
Owen, F. G. (Animal Science) - Pioneer HiBred International, Inc.	6,900
Peters, L. L. (South Central Station) - Stauffer Chemical Company	300
Rhodes, M. B. (Vet Science) - USDA/SEA	67,900
Roeth, F. W. (South Central Station) - Rohm and Haas Company	750
Roeth, F. W. (South Central Station) - American Cyanamid Company	400
Roeth, F. W. (South Central Station) - Stauffer Chemical Company	2,000
Satterlee, L. D. (Food Science & Technology) - UN Foundation-Abel Fund	10,000
Shearman, R. C. (Horticulture) - Mobay Chemical Corporation	750
Shearman, R. C. (Horticulture) - Layman Fund - UN Foundation	33,300
Smith, J., Yonts, C. D., Wilson, R. J. (Panhandle Station) - G. W. Joint Research Committee	13,250
Splinter, W. E. (Ag Engineering) - University Foundation	1,500
Steadman, J. R. (Plant Pathology) - E. I. DuPont DeNemours & Company	1,400
Stetson, L. E. (Ag Engineering) - Nebraska Inter-Industry Electric Council	1,000
Stubbendieck, J. (Agronomy) - UN Foundation - Anna Elliott Fund	9,275
Van Etten, J. L. (Plant Pathology) - Department of Energy	53,000
Watkins, J. E. (Plant Pathology) - Mobay Chemical Corporation	500
Wicks, G. A. (North Platte Station) - Stauffer Chemical Company	700
Wicks, G. A. (North Platte Station) - ICI Americas Inc.	1,500
Wicks, G. A. (North Platte Station) - American Hoechst Corporation	1,000
Wilson, R. G. (Panhandle Station) - Stauffer Chemical Company	1,800
Witkowski, J. F. (Northeast Station) - Mobay Chemical Company	600
	681,415

CALENDAR OF EVENTS

Friday, October 22nd	Nebraska Hall of Agricultural Achievement Dinner at 6:30 p.m. at the Nebraska Center
Tuesday - Thursday November 2 - 4th	International Symposium on Meat Science and Technology at the Nebraska Center

New Experiment Station Personnel

Irvin T. Omtvedt, Dean and Director of the Agricultural Experiment Station. Dr. Omtvedt is a native of Wisconsin and earned his B.S. degree in Agriculture from the University of Wisconsin-Madison in 1957 and his M.S. and Ph.D. degrees in Genetics and Animal Breeding from Okalahoma State University in 1959 and 1961, respectively. After a tour of duty in the U.S. Army, he served as Extension Swine Specialist at the University of Minnesota from 1962-64 until he assumed a research and teaching position in Animal Science at Oklahoma State University. From 1973-75 he served as Associate Director of the Alabama Agricultural Experiment Station and Assistant Dean of Agriculture at Auburn University. Dr. Omtvedt came to the University of Nebraska as Head of the Animal Science Department in February, 1975. He assumed his new responsibilities on October 1, 1982.

John P. Markwell, Assistant Professor, Department of Agricultural Biochemistry. Dr. Markwell received B.A. degrees in Biology and Chemistry from North Park College in Chicago in 1970 and a Ph.D. in Biochemistry in 1976 from Michigan State University. Before his arrival at Nebraska he did post-doctoral research in the departments of Bacteriology and Biology at the University of California in Los Angeles. Dr. Markwell was also selected as a visiting scientist by the United Kingdom Agricultural Research Council and spent several months at Imperial College in London. He is a member of the American Chemical Society and the American Society of Plant Physiologists. His primary research interest is the structure and function of the photosynthetic membrane and he has authored or co-authored 20 publications.

Derrel L. Martin, Instructor, Agricultural Engineering Department. Derrel received his B.S. in 1975 and M.S. in 1979 from the University of Nebraska, and is currently completing a Ph.D. from Colorado State University. Some of his past experience includes working as an agricultural consultant scheduling irrigation and as a research associate studying improved irrigation management. His research interests currently are in irrigation management with limited water resources, and in reduction of nitrate loading of groundwater through improved irrigation and fertility management. He will also be teaching agricultural engineering and mechanized agriculture classes. He joined the University of Nebraska in August, 1982.

Rick A. Stock, Extension Beef Specialist, Animal Science. Dr. Stock is a native of Oklahoma and received his B.S. in 1977 from Oklahoma State University and his M.S. and Ph.D. from the University of Nebraska in 1979 and 1982, respectively. Stock was a recipient of the Widamon Trust Award from the University of Nebraska, and is a member of the American Society of Animal Science and Gamma Sigma Delta. Dr. Stock will be assuming statewide leadership for the feedlot Extension programs in Animal Science, and he will be conducting research in the beef finishing area.

NEBRASKA AGRICULTURAL EXPERIMENT STATION PUBLICATIONS - September 1982

Journal Articles - Submitted for Publication (contact authors for more information)

6978. Nitrate/Nitrite: Knowledge, Attitudes and Practices of Rural Nebraskans. K. Anderson and C. Kies. Nutrition Research.

6979. Influence of Planting Dates and Seeding Rates on Yield and Other Agronomic Traits of Proso Millet (*Panicum miliaceum* L.). L. A. Nelson. Agronomy Journal.

6980. The Primary Structure of HC-Toxin. M. R. Pope, L. M. Ciuffetti, H. W. Knoche, D. McCrery, J. M. Daly and L. D. Dunkle. Bioorganic Chemistry.

6981. Peptidohydrolases of Soybean Root Nodules: II. Proteolytic Activity in Bacteroid Extracts. Cecilia Torres, Nancy E. Pfeiffer and Fred W. Wagner. Plant Physiology.

6982. Proteolytic Activity in Soybean Root Nodules: III. Activity in Host Cell Cytosol and Bacteroids Throughout Physiological Development and Senescence. Nancy E. Pfeiffer, Nasir S. A. Malik and Fred W. Wagner. Plant Physiology.

6983. The Water Activity Lowering Properties of Selected Humectants in Eggs. Yun-Chan Lo, G. W. Froning and R. G. Arnold. Poultry Science Journal.

6984. Effect of Dietary Vitamin E, Egg Storage and Age of the Bird on Yolk Membrane Stength. G. W. Froning, Bridget Sackett, F. John Struwe and Steve Lowry. Poultry Science Journal.

6985. An Evaluation of Bias in Estimated Breeding Values for Weaning Weight in Angus Beef Cattle Field Records. I. Estimates of Within Herd Genetic Trend. W. A. Zollinger and M. K. Nielsen. Journal of Animal Science.

6986. An Evaluation of Bias in Estimated Breeding Values for Weaning Weight in Angus Beef Cattle Field Records. II. Estimates of Bias Due to Genetic Trend. W. A. Zollinger and M. K. Nielsen. Journal of Animal Science.

6987. An Evaluation of Bias in Estimated Breeding Values for Weaning Weight in Angus Beef Cattle Field Records. III. Estimates of Bias Due to Non-random Mating. W. A. Zollinger and M. K. Nielsen. Journal of Animal Science.

6988. Nitrate and Nitrite Excretion of Humans as Influenced by Addition of Spinach to Free-Choice Diets. K. Anderson, G. Valceschini and C. Kies. Nutrition Reports International.

6989. Winter and Spring Distribution and Density of Banks Grass Mite (Acarina: Tetranychidae) in Adjacent Wheat and Corn. Thomas O. Holtzer, Thomas M. Perring and Marshall W. Johnson. Journal of Kansas Entomological Society.

6990. Correlated Responses of Carcass and Reproductive Traits to Lean Growth Selection in Swine. Erik R. Cleveland, R. K. Johnson and P. J. Cunningham. Journal of Animal Science.

6991. Growth Analysis Based on Degree Days. M. P. Russelle, W. W. Wilhelm and R. A. Olson. Crop Science.

6992. Narrow Row Soybean Production in Untilled Oat Stubble. O. C. Burnside and R. S. Moomaw. Agronomy Journal.

6993. Irrigation Scheduling Utilizing an Automated Weather Station. Albert Weiss and W. E. Smith. Agricultural Water Management.

6994. Nutrient Digestibility and Gastrointestinal Electrolyte Flux in the Elephant and Rhinoceros. E. T. Clemens and G. M. O. Maloiy. Comparative Biochemistry and Physiology.

6995. Analysis of Catalytic Subunit Microheterogeneity in RuBP Carboxylase/Oxygenase for *Nicotiana tabacum*. Sarjit Johal and Raymond Chollet. Archives of Biochemistry & Biophysics.

6996. The Energy Costs of Protein and Fat Deposition in Pigs Fed Ad Libitum. M. W. Tess, G. E. Dickerson, J. A. Nienaber, J. T. Yen and C. L. Ferrell. Journal of Animal Science.

6997. Use of Agricultural BMPS to Control Ground-Water Nitrogen. J. S. Schepers. Proc. The Sixth Nat'l Ground Water Quality Symposium.

6998. Potentials and Challenges of Interdisciplincy Research in Agriculture. C. A. Francis, R. G. Arnold, J. A. Deshazer, D. G. Hanway and I. T. Omtvedt. Minnesota Agr. Exp. Sta. Misc. Publ.

6999. Tissue Analysis and Hemolymph Translocation of ^{14}C-Chlorpyrifos Sorbed from Treated Surfaces by American Cockroaches. Timothy P. Miller, Roger E. Gold and Harold J. Ball. Pesticide Biochemistry & Physiology.

7000. Zinc Status of Adolescents as Affected by Zinc/Fat Intakes. L. S. Boeckner, S. Balters and C. Kies. Nutrition Research.

7001. Individual Differences in LH and FSH Responses to Orchidectomy and Testosterone Replacement Therapy in Rams. M. J. D'Occhio, B. D. Schanbacher and J. E. Kinder. Journal of Andrology.

7002. Luteinizing Hormone Secretion Following Withdrawal of Exogenous Progestin in Heifers Fed Three Levels of Dietary Energy. K. Imakawa, R. J. Kittok and J. E. Kinder. Journal of Animal Science.

7003. Genotype x Environment Interaction in Grain Sorghum (*Sorghum bicolor* (L.) Moench). II. Effects of Genotype Maturity. Mahammad Saeed, C. A. Francis and J. F. Rajewski. Crop Science.

<u>Abstracts - Submitted for Publication</u> (contact authors for more information)

82-1800. Influence of Glyphosate on Common Milkweed (*Asclepias syriaca* L.) Populations in Continuous Winter Wheat. Kenneth L. Carlson, Douglas D. Buhler and Orvin C. Burnside. Proc. WSSA.

82-1801. Soil Activity of Fluazifop, Sethoxydim, and Dowco 453 (methyl 2-(4-((3-chloro-5-(triflouromethyl)-2-pyridinyl) oxy(phenoxy)propanoate). Douglas D. Buhler and Orvin C. Burnside. Proc. WSSA.

82-1802. Competition and Allelopathy of Soybean (*Glycine max* (L.) Merr.) Cultivars to Weeds. Steven J. Rose, Orvin C. Burnside, James E. Specht, James H. Williams and Beth A. Swisher. Proc. WSSA.

82-1803. Effect of Total Weed Control on Demise of Weedseeds in Soil Over Years Across Nebraska. Kevin K. Watteyne, Orvin C. Burnside, Gail A. Wicks, Russell S. Moomaw, Robert G. Wilson and Fred W. Roeth. Proc. WSSA.

82-1804. Coating Native Grass Seed to Facilitate Aerial Seeding (Nebraska). J. Stubbendieck and Eric Kocher. Management and Resteration Notes.

82-1805. Wild Proso Millet (Panicum miliaceum) Control in Corn. Robert G. Wilson. Weed Science Society of America.

82-1806. Optimum Period for Weed Control in Soybeans in Eastern Nebraska. Paul W. Horn and Orvin C. Burnside. Proc. WSSA.

82-1807. Blowout Penstemon (*P. haydeni* S. Wats.): A Rare Sandhills Endemic. Ronald R. Weedon, Donna J. Norton and J. Stubbendieck. Management and Resteration Notes.

82-1808. Narrow Row Soybean Production in Untilled Oat Stubble. Orvin C. Burnside and Russell S. Moomaw. Proc. WSSA.

82-1809. Translocation and Metabolism of Chlorsulfuron in Canada Thistle (*Cirsium arvense* (L.) Scop.). Phil J. Petersen, Beth A. Swisher and Robert G. Wilson. WSSA Abstract.

82-1810. Reversing Divalent Cation - Induced Reductions in Glyphosate Activity with Chelating Agents. P. J. Shea and D. R. Tupy. WSSA Abstracts.

82-1811. Herbicide Placement by Subsurface Injection. Orvin C. Burnside, John B. Solie and Howard D. Wittmuss. Proc. NCWCC.

82-1812. Competitive Ability of Winter Wheat (*Triticum aestivum* L.) Cultivars to Cheat (*Bromus secalinus* L.). Challaiah, Orvin C. Burnside, Gail A. Wicks, Virgil A. Johnson and Beth A. Swisher. Proc. WSSA.

82-1813. Growth Characteristics of Dense and Normal Pubescent Isogenic Strain of Two Soybean Cultivars. K. L. Clawson, J. E. Specht and B. L. Blad. Agronomy Abstracts.

82-1814. Effect of Moisture Stress on Corn Canopy Reflectance in the Thematic Mapper Wavebands. B. R. Gardner, B. L. Blad and D. L. Thompson. Agronomy Abstracts.

82-1815. Influence of Soybean Pubescence Type on Radiation Balance and Leaf Photosynthesis. David C. Nielsen, Blaine L. Blad and Shashi B. Verma. Agronomy Abstracts.

82-1816. University of Nebraska Automated Weather Data Collection Network. N. J. Rosenberg, K. G. Hubbard and D. C. Nielsen. Agronomy Abstracts.

82-1817. Pea Aphid Control on Alfalfa, 1982. G. R. Manglitz, M. Rethwisch and W. H. Kehr. Insecticide and Acaricide Tests.

82-1818. Greenbug (biotype E) Control on Grain Sorghum, 1982. S. Dean Kindler and Steven M. Spomer. Insecticide and Acaricide Tests.

82-1819. Effect of Combined Rotavirus and *E coli* Infections in Newborn Gnotobiotic Calves. Alfonso Torres-Medina. Proceedings 63rd Conference of Research Workers in Animal Diseases.

82-1820. Human Rotavirus Infection in Gnotobiotic Piglets: Effects of Environmental and Dietary Factors. Alfonso Torres-Medina. Proceedings 63rd Conference of Research Workers in Animal Diseases.