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THE AGRICULTURAL EXPERIMENT STATION
INSTITUTE OF AGRICULTURE
AND NATURAL RESOURCES
UNIVERSITY OF NEBRASKA-LINCOLN
H. W. OTTOSON, DIRECTOR

Agricultural Experiment Station



Vol. 9, No. 2, August 1976

FROM THE DIRECTOR'S DESK

Energy Impacts on Agriculture; 1976-2000

These comments are some summary excerpts from a 25 page task force report which I prepared for the Great Plains Agricultural Council. The report is to be published in the near future.

Whether petroleum reserves are projected to last 25 years or 75 years is only a matter of degree in describing the absolute necessity and dealing with economic, social, and political stresses of a major transition in energy-usage patterns. In this highly stressed transition process, the agricultural sector will be concurrently called upon to provide for much increased world food needs and to accommodate environmental protection and natural resource management concerns. Internationally, United States agriculture is central to the balance of payments, diets and power. All these reflect favorably on the future of our agriculturally potent state.

Only about one percent of the United States energy inputs is used directly on farms and ranches. An additional 1.9% goes into agricultural production in the form of chemicals, fertilizers, facilities, machinery, transportation, etc. This fact, combined with the essential domestic and international role of the United States food production system, suggests that agriculture should not be regarded as a major source of energy consumption relief. Indeed, it should be regarded as the energy synthesizer that it is. However, this perspective does not exempt agriculture from the energy transition agenda which will call for (1) conservation and use reduction of petroleum fuels, (2) conversion to usage of less critical coal and nuclear fission, and (3) development of sustainable energy sources and usage such as solar, wind, waste materials, nuclear fusion, and breeder reactors.

Economics will dominate the implementation of energy usage adjustments, particularly in the food production system. Reliability of supply of certain fuels will have impacts, but as an economic dimension. Regulation, almost certain to become a major instrument of national energy policy, will accommodate the national interest in food production. Evaluation of agricultural practices must evolve to routinely include the energy usage parameter.

In agriculture the heavy energy inputs of fertilizer, tillage, irrigation and crop drying will be subject to particular stress. But conversion to less critical energy sources and/or elimination of some energy intense operations (minimum tillage and field crop drying) are readily conceivable, given transition time and economic inducement. Transportation of people and products presents a more complex energy problem, but not one unique to agriculture in calling for new transport technology.

The next quarter century will present agriculture with a series of short-term challenges for technological and economic adjustments to the "transition" of the energy base. But, "transition" implies movement toward some new state. In this case the new state must include a sustainable energy base for food production. Thus, in addition to providing for the short-term adjustments, all agencies serving agriculture must engage the longer term challenge of an agricultural production system independent of diminishing residual fuel sources.

R. W. Kleis

PERSONNEL ACTIONS

Dawes, A. Neil - Extension Agriculturist - Retirement
 Gilbertson, Osmund S. - Professor & Chairman, Ag. Education - New appointment
 Huff, Edward R. - Associate Professor, Ag. Engineering - Special appointment
 Kelling, Clayton - Assistant Professor, Veterinary Virologist - New appointment
 McClure, Victor B. - Extension Agriculturist - Retirement
 Miller, Gary - Assistant Professor, Food & Nutrition - Resignation
 Mohler, Jerry L. - District Ext. Forester, Assistant Professor Forestry - Resignation
 Pierson, Emil - Instructor, Horticulture - New appointment
 Waldren, Richard P. - Instructor, Agronomy - Special appointment
 Wallace, Mike W. - Instructor, Forestry - New appointment

GRANTS AND CONTRACTS

Anderson, F. N. - Agronomy (PH Sta) - Fisons Corporation	\$ 500
Ball, H. J. - Entomology - FMC Corporation	500
Bashford, L. L. - Ag. Engr. - Neb. Dept. Revenue, State Energy Office	125,000
Burnside, O. C. - Agronomy - Miscellaneous Donors	1,000
Campbell, J. B. - Entomology (NP Sta) - Shell Development Company	5,000
Campbell, J. B. - Entomology (NP Sta) - ICI United States	1,500
Clanton, D. C. - Animal Science (NP Sta) - International Minerals	2,000
Coyne, D. P. - Horticulture - Bean Companies of the area (Scottsbluff, NB)	2,100
DeShazer, J. A. - Ag. Engineering - USDA-ARS	7,500
Fenster, C. R. - Agronomy (PH Sta) - Eli Lilly and Company	1,000
Fenster, C. R. - Agronomy (PH Sta) - Chevron Chemical	1,000
Fenster, C. R. - Agronomy (PH Sta) - Shell Chemical Company	1,000
Flowerday, A. D. - Agronomy - Diamond Shamrock	1,600
Flowerday, A. D. - Agronomy - Fisons Corporation	2,000
Guyer, P. Q. - Animal Science - LeDioyt Land Company	4,500
Hagen, A. F. - Entomology (PH Sta) - Miscellaneous Donors	1,000
Kindler, S. D. - Entomology - FMC Corporation	500
Mattern, P. J. - Agronomy - Nebraska Wheat Development	5,610
Mayo, Z. B. - Entomology - Chemagro	1,000
Mayo, Z. B. - Entomology - FMC Corporation	1,000
Mayo, Z. B. - Entomology - American Cyanamid Company	1,500
Mebus, C. A. - Veterinary Science - Jensen-Salsbery Labs	900
Nielson, M. K. - Animal Science - American Simmental Association	500
Olson, R. A. - Agronomy - Tennessee Valley Authority	12,500
Peters, L. L. - Entomology (SC Sta) - Miscellaneous Donors	1,300
Shahani, K. M. - Food Science & Technology - Dairy Products Lab	2,500
Trimmer, W. - Ag. Engineering (PH Sta) - Miscellaneous Donors	2,848
Wilson, R. G. Jr. - Agronomy (PH Sta) - Miscellaneous Donors	2,850
Witkowski, J. F. - Entomology (NE Sta) - Miscellaneous Donors	1,000
Wicks, G. A. - Agronomy (NP Sta) - Stauffer Chemical Company	500

GENERAL NOTES

1. The first Panhandle Station Field Day held at the new facility was a great success in terms of program, attendance, and arrangements. Likewise, the 1976 Tractor Power and Safety Day was the traditional major and successful event.
2. The South Central Station Field Day - August 17.
3. The Search Committee for Agronomy Department Chairman has been appointed and has been organized and activated. Members are: Mr. Dwight Baltensperger, Dr. O. C. Burnside, Dr. E. A. Dickason, Dr. Jerry D. Eastin, Dr. Charles Gardner, Dr. Herman Gorz, Mr. Mark Hooker, Dr. R. W. Kleis, Mr. Delmar Lange, Dr. David Lewis, Dr. Lowell Moser, Mr. Robert Nielson, Prof. R. A. Olson, Mr. Clare Porter, Dr. George Rehm.
4. We hope you have had, are having, or will have an enjoyable vacation.

R. W. Kleis

NEBRASKA AGRICULTURAL EXPERIMENT STATION PUBLICATIONS - July 1976

Journal Articles (contact authors for more information)

5129. A Multienzyme-Automatic Recording Technique for in vitro Protein Digestibility. H. W. Hsu, D. L. Vavak, L. D. Satterlee and G. A. Miller. Journal of Food Science.
5130. Alfalfa Seed Germination Response to Electrical Treatments. S. O. Nelson, W. R. Kehr, L. E. Stetson, R. B. Stone and J. C. Webb. Crop Science.
5131. Factors Affecting Quality, Physical and Chemical Characteristics of Mechanically Deboned Poultry Meat. G. W. Froning. Journal of Food Technology.
5132. The Brown-Rosenberg Resistance Model of Crop Evapotranspiration Modified: Tests in an Irrigated Sorghum Field. Shashi B. Verma and Norman J. Rosenberg. Agronomy Journal.
5133. Mechanical Tenderization of Beef Inside Rounds as Affected by Ration and Biological Type. J. F. Campbell, K. L. Neer, R. W. Mandigo, F. Caporaso and Gerald M. Smith. Journal of Animal Science.
5134. Allantoin Determination. Raymond Borchers. Analytical Biochemistry.
5135. Perceptions of Loneliness from Different Life Situations. John C. Woodward and Mary Jane Visser. Home Economics Research Journal.
5136. Combining Ability Effects for Resistance to Four Insects in Selected Alfalfa (Medicago sativa L.) Clones. J. L. Kugler, W. R. Kehr and R. L. Odgen. Crop Science.
5137. Nucleic Acid & Protein Syntheses During Fungal Spore Germination. Robert Brambl, Larry D. Dunkle and James L. Van Etten. A chapter in the book, "The Filamentous Fungi."
5138. Using Clothing in a Positive Way as Part of the Rehabilitating Process. Audrey Newton. Journal of Rehabilitation.
5139. Quality Variation of Feedlot Runoff in Storage. C. L. Linderman and J. R. Ellis. Transactions of the ASAE.
5140. Demise of Shattercane Seed in Soil Across Nebraska. O. C. Burnside, G. A. Wicks and C. R. Fenster. Weed Research Journal - England.
5141. Interrelationship of Dietary Vitamin D₃ with Zinc and Iron in Young Turkeys. Ayhan Aksoy and T. W. Sullivan. Poultry Science.
5142. Interrelationship of Dietary Vitamin D₃ with Potassium, Sodium and Magnesium in Young Turkeys. A. Aksoy and T. W. Sullivan. Poultry Science.
5143. Animal Performance Models. N. C. Teter and J. A. DeShazer. Transactions of the ASAE.
5144. Influence of Lighting Schedules on Heat Losses of Laying Hens. G. L. Riskowski, J. A. DeShazer and F. B. Mather. Transactions of the ASAE.

5145. Environmental Control for Swine Housing Based on Energy Conservation and Animal Performance. G. R. Stevens, J. A. DeShazer, T. L. Thompson and N. C. Teter. Transactions of the ASAE.
5146. The Description of Materials - Only a Beginning. T. L. Thompson and G. L. Zachariah. Transactions of the ASAE.
5147. Multiple Testing as Related to Student Learning in a Course on Soil Morphology Classification and Survey. D. T. Lewis. Journal of Agric. Education.
5148. A Study of the USDA Special Food Service Program for Children: School and Home Food Intake. Susan Williams and Hazel Fox. Journal of the American Dietetic Association.
5149. Insulin and Glucose Effects on Amino Acid Metabolism in Pregnant and Nonpregnant Sheep. R. L. Prior and R. K. Christenson. American Journal of Physiology.
5150. Great Northern STAR Dry Bean Tolerant to Bacterial Diseases. D. P. Coyne and M. L. Schuster. HortScience.
5151. Inheritance of Protein and Lysine in Three Wheat Crosses. A. L. Diehl, V. A. Johnson and P. J. Mattern. Crop Science.
5152. Preparation and Characterization of Immobilized Lactase. A. Kilara, K. M. Shahani and Fred W. Wagner. Lebensm-Wissu, U-Technol. Jr.
5153. Synthesis of Polyadenylate-Containing RNA During the Germination of Rhizopus stolonifer Sporangiospores. Shelby N. Freer, Mari Mayama and James L. Van Etten. Journal of Bacteriology.
5154. Leaching of Water and Nitrate Under Furrow- and Center-Pivot-Irrigated Corn. L. N. Mielke, C. L. Linderman and J. S. Schepers. Soil Science Society of America Journal.

Journal Abstracts (contact authors for more information)

- 76-776. Significance of Mycotoxins to Food Safety and Human Health. L. B. Bullerman. Presented at the 63rd Annual Meeting of International Assoc. of Milk, Food and Environmental Sanitarians, Chicago, August 8-12, 1976.
- 76-777. Crossbred Boars and Animal Breeding Theory. W. T. Ahlschwede. Journal of Animal Science.
- 76-778. Clothing Related Thermal Burn Injuries and Deaths in Nebraska for Fiscal Year 1975. Joan Laughlin and Judith Besel Trautwein. Apparel Research Journal.

BULLETINS PRINTED

- SB 538. Dry Edible Bean Production Cost in Scotts Bluff County, Nebraska for 1974. Robert E. J. Retzlaff.