4-1991

ARD News April 1991

Agricultural Research Division News

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April 1991 Volume 25, Number 4

INFORMED CONSENT OF HUMAN RESEARCH SUBJECTS

All researchers have a legal and an ethical obligation to ensure their subjects fully comprehend all the elements of informed consent. The Nuremberg Code (Principle 1) states the subject "should have sufficient knowledge and comprehension of the elements of the subject matter involved as to enable him to make an understanding or enlightened decision".

21 CFR 50.20 and 45 CFR 46 state: "An investigator shall seek such consent only under circumstances that provide the prospective subject or the representative sufficient opportunity to consider whether or not to participate and that minimize the possibility of coercion or undue influence. The information that is given to the subject or the representative shall be in language understandable to the subject or the representative. The consent form should be written at an educational level compatible with the language skills and understanding of the least sophisticated of the subjects to be used in the study.

21 CFR.25 Elements of informed consent.
(a) Basic Elements of informed consent.

(1) A statement that the study involves research, an explanation of the purposes of the research and the expected duration of the subject's participation, a description of the procedures to be followed, and identification of any procedures which are experimental.
(2) A description of any reasonably foreseeable risks or discomforts to the subject.
(3) A description of any benefits to the subject or others which may reasonably be expected from the research.
(4) A disclosure of appropriate alternative procedures or courses of treatment, if any, that might be advantageous to the subject.
(5) A statement describing the extent, if any, to which confidentiality of records identifying the subject will be maintained.
(6) For research involving more than minimal risk, an explanation as to whether any compensation and an explanation as to whether any medical treatments are available if injur occurs and, if so, what they consist of or where further information may be obtained.
(7) An explanation of whom to contact for answers to pertinent questions about the research and research subjects' rights, and whom to contact in the event of research-related injury to the subject.
(8) A statement that participation is voluntary, that refusal to participate will involve no penalty or loss of benefits to which the subject is otherwise entitled, and that the subject may discontinue participation at any time without penalty or loss of benefits to which the subject is otherwise entitled.

This should be accomplished by using a simple, but complete, consent form, written at the appropriate reading level. The consent form should be as *short as possible* but *as long as necessary* to include the information the subject needs to make an informed decision. The consent form does not, by itself, constitute informed consent. Rather, the informed consent form should serve as a guide for the investigator to negotiate informed consent with the prospective subject. During the process of informed consent, each element of the consent form should be carefully explained the prospective subject. The investigator should assess the subject's comprehension by asking appropriate questions. The researcher bears full responsibility for obtaining valid consent from the subject.

Anyone who is listed as an investigator (primary or secondary) must be completely familiar with the research protocol and must assume responsibility for the development and submission of the protocol to the Institutional Review Board, and for the subsequent conduct of the research. It is the investigator's responsibility to obtain informed consent from research subjects.

PEER REVIEW

Certification of peer review is required for all protocols submitted to IRB. Peer review is normally done by the department head, authorized delegate or appointed peer review committee. A peer reviewer must not have a conflict of interest. The most common errors related to conflict of interest, e.g., listing as the peer reviewer a researcher who is listed as an investigator. The "major professor" for the thesis or dissertation is usually listed as the co-investigator or secondary investigator, and therefore in conflict of interest when the major professor signs as the peer reviewer.

FACTS ABOUT RESEARCH FUNDING

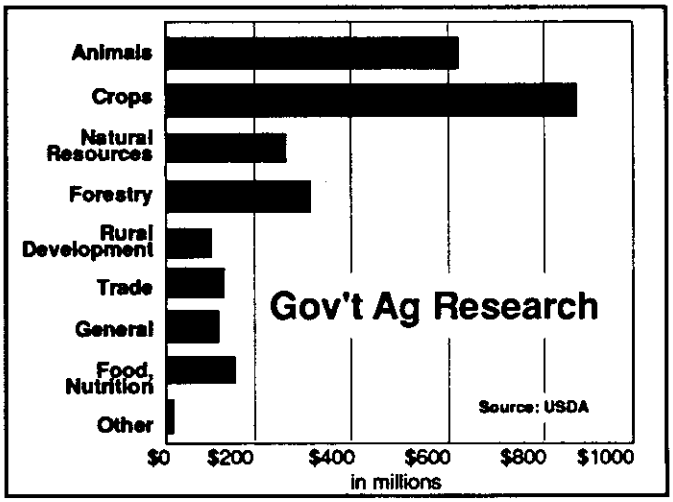
• In 1991 the total U.S. investment in research and development (R & D) will reach $158 billion. About 49.2, 46.3, and 4.4% of the funds will be provided by private industry, the federal government, and universities and nonprofit organizations, respectively. About 71.5, 17.4, and 11% of the research will be conducted by industry, universities, and the federal government, respectively.

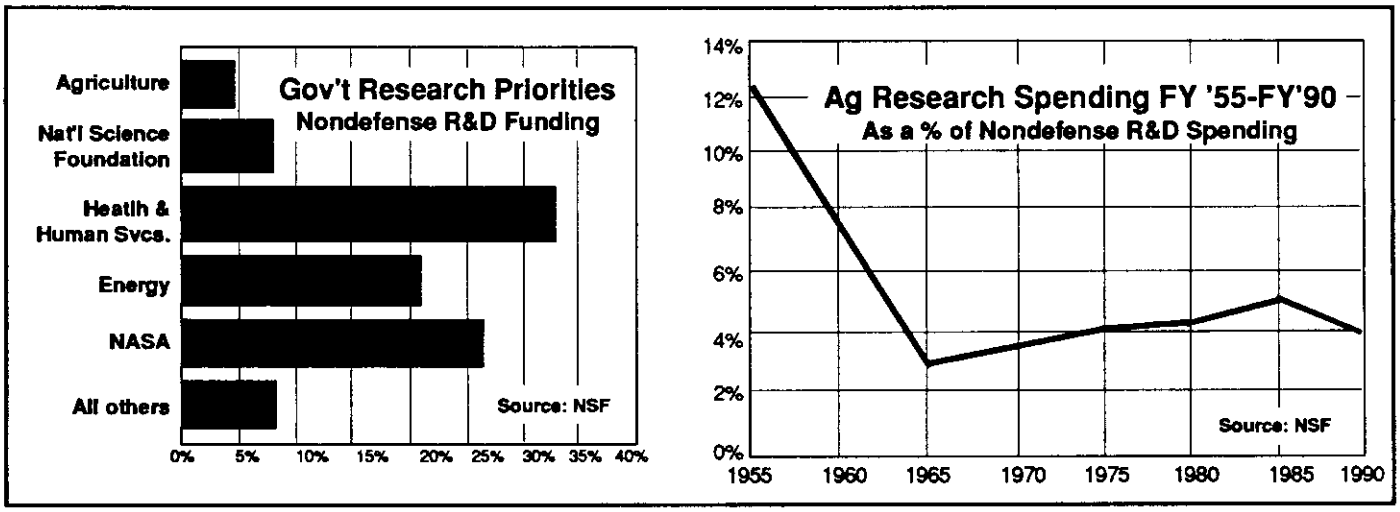
• Of the total FY1991 federal R & D funds, 55.1% are budgeted to DOD. The proportion of R & D funds assigned to HHS, DOE, and NASA are 13.3, 8.9, and 10.6%, respectively. Only 1.8% of federal R & D funds are spent on agricultural research.

• Japan and the U.S. spend about 4-5% of nondefense R & D funds on agricultural research, whereas Canada and Australia spend more than 20% of nondefense R & D funds on agriculture.

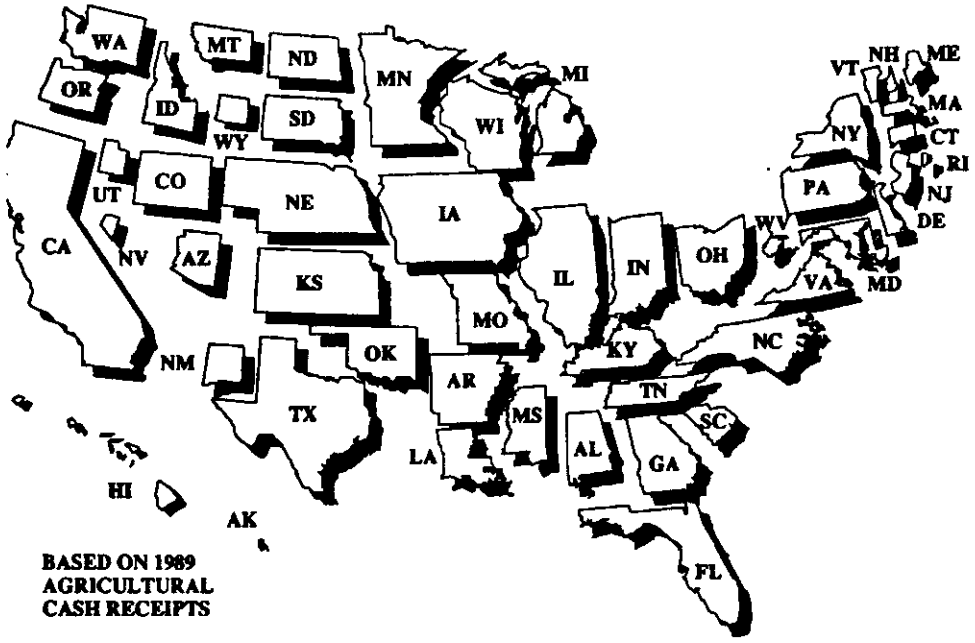
• Trends in federal agricultural research funding and allocation of nondefense R & D funds are presented in the figure below:

• Allocation of federal agricultural research funds to program areas are shown in the figure below:





AGRICULTURE IN PERSPECTIVE



LASER INTERFEROMETER GRAVITATIONAL WAVE OBSERVATORY

The Agriculture Research and Development Center, Mead, is one of 16 sites in the United States to proposed for a Laser Interferometer Gravitational Wave Observatory (LIGO). The State of Nebraska and the University of Nebraska submitted a proposal to site a LIGO facility at ARDC.

LIGO is a joint project between Caltech and MIT, to be funded by the National Science Foundation. President Massengale recommended that the ARDC would be a potential site thus IANR and the Physics personnel developed a site proposal package which was submitted by President Massengale and Governor Nelson in February 1991.

This 200 million dollar package will consist of two widely separated (ideally 1,500 to 3,000 miles) installations within the United States. The LIGO will be a four foot diameter vacuum tube arranged in the shape of an "L". Each leg of the "L" will be 2.5 miles long. The tube will lie on a 20 foot wide concrete pad and entirely buried or covered with concrete. The vertex of the "L" will be in the northeast corner of the center.

Nebraska's proposal is one of 18 proposed sites, in 17 states. The initial evaluation will take about two months. The chosen site must be available for 25 years.

The ARDC is a prime potential site because the area is relatively level and flat. There is adequate room for support buildings at the vertex, both ends and at the mid-point of each leg. Adequate utilities exist.

The site is remote from repetitive man made noise, but is convenient to Wahoo, Lincoln, Fremont, and Omaha. This site provides easy access to airports, housing, schools, and shopping areas.

This major, basic research facility will, if gravitational waves are detected, bring researchers from throughout the international community. The Department of Physics and Astronomy will benefit greatly from this installation as well as the ARDC and the IANR.

"AGRICULTURE IN CONCERT WITH THE ENVIRONMENT" PROGRAM

The North Central LISA Administrative Council agreed to participate in a joint EPA/USDA CSRS research and education grants program (Agriculture in Concert with the Environment). The Administrative Council received 147 ACE Preproposals (30 resubmitted LISA Preproposals). The NCR LISA Administrative Council Executive Committee selected 23 preproposals ($1,299,065) for further consideration at the regional funding level. One preproposal was selected to be forwarded for the National Initiative.

Table 2: State distribution of preproposals received ( ) and invited full proposals for ACE.

Illinois	16 (1)	Michigan	14 (4)	North Dakota	7 (2)
Indiana	10	Minnesota	14 (1)	Ohio	14 (1) (N)
Iowa	20 (5)	Missouri	10	South Dakota	9 (2)
Kansas	3	Nebraska	16 (3)	Wisconsin	13 (4)

RACE/ETHNICITY TRENDS IN Ph.D. DEGREES AWARDED BY U.S. INSTITUTIONS OF HIGHER EDUCATION

	Men		Women	
	1978-79	1988-89	1978-79	1988-89
	% of total			
Ph.D. in agriculture[1]				
White, nonhispanic	60.2	43.8	5.3	13.3
Black, nonhispanic	1.5	1.0	0	0.3
Hispanic	1.1	1.4	0.2	0.3
Asian	3.1	1.9	0.5	0.7
Native american	0	0	0	0
Noncitizen	26.5	32.3	1.7	5.1
Ph.D. in home economics[2]				
White, nonhispanic	31.1	19.0	59.4	59.7
Black, nonhispanic	0.5	0	3.7	4.6
Hispanic	0	0	0	0.8
Asian	0.5	0.8	1.4	1.5
Native american	0	0	0	0
Noncitizen	0.5	2.7	3.2	11.0

[1] Total Ph.D. degrees awarded were 950 and 1184 in 1978-79 and 1988-89, respectively.
[2] Total Ph.D. degrees awarded were 219 and 263 in 1978-79 and 1988-89, respectively.

RACE/ETHNICITY TRENDS IN M.S. DEGREES AWARDED BY U.S. INSTITUTIONS OF HIGHER EDUCATION

	Men		Women	
	1978-79	1988-89	1978-79	1988-89
	% of total			
M.S. in agriculture[1]				
White, nonhispanic	60.0	45.1	16.3	23.4
Black, nonhispanic	1.5	1.3	0.5	0.4
Hispanic	0.7	1.2	0.2	0.5
Asian	1.9	1.0	0.7	0.7
Native american	0.1	0.2	0	0
Noncitizen	15.5	20.0	2.6	6.3
M.S. in home economics[2]				
White, nonhispanic	7.3	11.0	79.1	72.7
Black, nonhispanic	0.4	0.6	4.4	2.5
Hispanic	0	0.6	0.9	1.5
Asian	0.1	0.2	1.9	2.3
Native american	0	0	0.2	0.4
Noncitizen	0.9	1.9	4.7	6.3

[1] Total M.S. degrees awarded were 3994 and 3245 in 1978-79 and 1988-89, respectively.
[2] Total M.S. degrees awarded were 2510 and 2174 in 1978-79 and 1988-89, respectively.

NEW OR REVISED PROJECTS

The following station projects were approved recently by the USDA Cooperative State Research Service:

11-085 (Biological Systems Engineering) Evaluation of Tractor Performance and Test Data
Investigator: L. L. Bashford
Status: New Hatch project effective February 12, 1991

12-193 (Agronomy) Investigating Alternative Grain and Oil Crops for Nebraska
Investigator: L. A. Nelson
Status: New Hatch project effective February 1, 1991

12-196 (Agronomy) Reaction of Synthetic Organic Compounds with the Inorganic Components of Soils
Investigator: D. L. McCallister
Status: New Hatch project effective December 13, 1990

12-197 (Agronomy) Tissue and Cell Physiology of Sorghum
Investigator: M. D. Clegg
Status: New Hatch project effective February 1, 1991

12-198 (Agronomy) Jasmonate Regulated Gene Expression in Soybean
Investigator: P. Staswick
Status: New Hatch project effective February 1, 1991

12-199 (Agronomy) Herbage and Livestock Production Potential From Native Warm-Season Grasses
Investigator(s): B. E. Anderson & L. E. Moser
Status: New Hatch project effective March 1, 1991

13-105 (Animal Science) Nutrition of Prolific Sows
Investigator(s): A. J. Lewis & P. S. Miller
Status: New Hatch project effective February 1, 1991

13-106 (Animal Science) Nutritional Value of Cereal Grains for Poultry
Investigator(s): T. W. Sullivan, D. J. Andrews, & P. S. Baenziger
Status: New Hatch project effective February 11, 1991

15-055 (Biochemistry) Structure, Function and Mechanisms of Action of Peptidases
Investigator: F. W. Wagner
Status: New Hatch project effective September 5, 1990

26-015 (Forestry, Fisheries & Wildlife) Molecular Characterization of Shoot Induction Competence Events in *Populus deltoides*
Investigator: S. G. Ernst
Status: New Competitive Grant effective September 19, 1990

27-009 (Agricultural Meteorology) Climate and Agroecosystem Modeling: Developing Information for Decision Making
Investigator: A. Weiss
Status: New Hatch project effective December 13, 1990

43-033 (West Central Research and Extension Center) Biology, Ecology and Population Management Strategies for Muscoid Flies Affecting Cattle
Investigator: J. B. Campbell
Status: Revised Hatch project that contributes to NC-154

GRANTS AND CONTRACTS RECEIVED FEBRUARY & MARCH, 1991

Agronomy	
Moser, L., Waller, S. & Miller, M. - UN Found.	16,643
Miscellaneous Grants Under $5,000 each	71,035
Animal Science	
Calkins, C. - National Livestock & Meat Board	80,620
Calkins, C. - Nebraska Beef Industry Board	37,500
Miscellaneous Grants Under $5,000 each	10,230
Biochemistry	
Chollet, R. - National Science Found.	220,000
Biological Systems Engineering	
Dickey, E. & Shelton, D. - KSU - EPA	55,346
Miscellaneous Grants Under $5,000 each	9,506
Entomology	
Stanley-Samuelson, D. - USDA-FS	15,000
Miscellaneous Grants Under $5,000 each	12,350
Environmental Programs	
Miscellaneous Grants Under $5,000 each	5,000
Food Processing Center	
Miscellaneous Grants Under $5,000 each	12,170
Food Science & Technology	
Miscellaneous Grants Under $5,000 each	5,688
Horticulture	
Coyne, D. P. - UN Foundation	17,000
Horst, G. - U.S. Golf Association	29,000
Riordan, T. P. - U.S. Golf Association	45,000
Riordan, T. P. & Westerholt, S. - NTEP	6,000
Miscellaneous Grants Under $5,000 each	36,438
Industrial Ag Products Center	
Miscellaneous Grants Under $5,000 each	1,282
Northeast Research & Extension Center	
Miscellaneous Grants Under $5,000 each	5,591
Panhandle Research & Extension Center	
Baltensperger, D. - UN Foundation	14,000
Hein, G. - Anna H. Elliott	14,000
Lyon, D. J. - UN Foundation	13,500
Miscellaneous Grants Under $5,000 each	6,450
Plant Pathology	
Steadman, J. - Uni. of Puerto Rico	39,000
Vidaver, A. K. - Crop Genetics International	68,128
Miscellaneous Grants Under $5,000 each	650
South Central Research & Extension Center	
Miscellaneous Grants Under $5,000 each	1,000
Veterinary Science	
Kelling, C. L. - UN Foundation	5,000
Waller-Pendleton, E. - S/Eastern Poult/Egg Assn	12,000
Miscellaneous Grants Under $5,000 each	30,130
Water Resources Center	
Martin, D. - UN Foundation	15,000
West Central Research & Extension Center	
Adams, D. C. - UN Foundation	19,000
Miscellaneous Grants Under $5,000 each	6,000
GRAND TOTAL	**935,257**

THE U.S. AGRICULTURE AND FOOD SYSTEM

- The U.S. food and fiber system generates 19.6 million jobs (about 16.2% of the workforce) and represents 17% of our nation's GNP. About 91% of agricultural jobs are off the farm.
- The U.S. agricultural labor force represents 0.3% of the world's agricultural labor force, yet is produces 8% of the world's food grains, 27% of the world's feed grains and 25% of the world's beef.
- In 1989 over $3.2 billion were spent on conservation measures for U.S. farmland.
- Less than 2% of the U.S. population lives on farms today; in 1920 it was 30%; and, when the Constitution was signed, it was 90%.
- Farms with sales over $250,000 constituted only 5% of all farms.
- Like other independent businesses, many U.S. farms are incorporated but nearly 82% are family held.
- Nearly 54% of U.S. farmers work second jobs off the farm.
- Less than 12% of the U.S. household budget is spent on food. By comparison, the portion of the household budget spent on food is 21% in Japan, 40% in the USSR, 42% in Greece, and 65% in Sierra Leone.
- To serve American consumers there are 150,000 grocery retailers in the U.S. which employ approximately 2.5 million people.

CHARACTERISTICS OF NORTH CENTRAL REGIONAL RESEARCH PROGRAM

	All NC SAESs		NAES
	1980	1989	1989
Regional projects (NC)	54	53	44[1]
Regional committees (NCR)	53	126	65[1]
Total research projects	4,165	4,118	320
Scientist years	1,737	1,762	140
$/scientist year (000)	136	243	235
$/project (000)	57	104	109

[1]Number of projects/committees on which the Nebraska Agricultural Experiment Station has representation.

CHARACTERISTICS OF SAESs - 1989

	Total of all SAESs	Nebraska AES	NEAS/all SAESs
Total $ (millions)	1,490	32.8	2.2 %
Scientist years	6,876	140	2.0 %
$/SY (thousands)	217	235	108 %