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## Center for Sustainable Agricultural Systems Newsletter, May/June 1993

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## May-June 1993 CSAS Newsletter

The University of Nebraska-Lincoln Center for Sustainable Agricultural Systems is an interdisciplinary center formed in 1991 for the purpose of bringing together people and resources to promote an agriculture that is efficient, competitive, profitable, environmentally and socially sustainable for the indefinite future. This electronic version of the Center's bimonthly newsletter is published 10-14 days before those on our mailing list receive their hard copy. At this time there is no charge for being on our newsletter mailing list. To be added to the list, or for questions or comments, contact the newsletter editor, Pam Murray, Administrative Coordinator, Center for Sustainable Agricultural Systems, 221 Keim Hall, University of Nebraska-Lincoln, Lincoln, NE 68583-0949, phone - (402) 472-2056, fax - (402) 472-7904, email - [CSAS001@UNLVM.EDU](mailto:CSAS001@UNLVM.EDU).

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### SUSTAINABLE AG TOUR

The 13th annual Sustainable Agriculture Tour will be held in south central Nebraska on August 5, 1993. The tour begins at the South Central Research and Extension Center (SCREC) near Clay Center, and includes visits to Oak Creek Farms (Edgar), Loschen Farm (Hildreth), Starr Farms (Hastings) and The Grain Place (Marquette). Among other things participants will see white corn and waxy corn for the specialty markets, confectionary and oil type sunflowers, mungbeans, cotton, production and application of compost, seed soybeans, commercial marketing of blue and white corn including corn chips, sunflowers, beefaloes, organic crop production and a world-class processing and marketing operation that now markets across the U.S. and elsewhere. Participants may join the tour from Clay Center or Lincoln. The bus will leave Lincoln from the Nebraska Center (33rd & Holdrege) at 6:30 a.m. and arrive at the SCREC by 8:15. Deadline for receipt of the \$25 registration fee is July 26. The tour is co-sponsored by the CSAS and the Nebraska Sustainable Agriculture Society. Contact the CSAS for more information.

## **ERS SUSTAINABLE AG INITIATIVE**

The following report was submitted to SANET (an electronic mail group on sustainable agriculture) by Gabriel Hegyes with the National Agricultural Library on May 6. The report is an update on sustainable agriculture research provided by the Research and Technology Division (RTD) of the Economic Research Service, USDA. RTD's research program has emphasized long-term concerns about resource use and changes in environmental quality. The new research program on sustainable agriculture will reinforce this orientation. Indeed, the raison d'être of sustainable agriculture is the belief that conventional agricultural production systems may not be sustained in the long term because of their consequences for environmental quality and because of their inability to achieve an equitable intergenerational allocation of resources.

RTD's New Section. The focus of work within the new Sustainable Production Systems Section will be to examine the economic tradeoffs associated with the adoption of sustainable agricultural systems, defined as systems of production which:

- reduce environmental damage in general and agricultural use in particular,
- consider other intergenerational allocations of resources, and
- maintain economic viability of farming and farm communities.

The Section's research program will include examination of agricultural and trade policies and programs that are seen to affect sustainable production systems and, by implication, the structure of the food-agricultural sector. Research will seek to determine the interactions between the current structure of production systems and supporting agricultural services as they relate to sustainability in the U.S. Environmental and intergenerational resource allocation effects of sustainable systems will also be evaluated.

What About Intergenerational Equity? Sustainable agriculture research looks beyond conventional economic models that view sustainability as an "externalities" problem to focus on the underlying issue of intergenerational equity. An efficient path of resource depletion, given the existing intergenerational distribution of rights to those resources, is optimal only with respect to that existing distribution. Hence it may not be sustainable. Similarly, advocates of sustainable agriculture argue that the current system of farming is guilty of disregard for the interests of future generations. This suggests a need to address equity considerations in economic analyses of sustainability.

A database is being developed to produce a profile of sustainable production systems that describes sustainable farms and producers' perceptions of the benefits and costs of sustainable production systems. To accomplish this objective, we are beginning with a review of existing data sources, including results compiled from surveys conducted by the American Farmland Trust, Rodale Institute, and American Farm Bureau Federation. The Section also will explore opportunities for collaborating on existing surveys that target sustainable farm operations. Another option is to design an independent national survey of

alternative agriculture which would provide data to support future research.

A project to analyze the economics of adopting sustainable production practices has been initiated. These studies are (1) developing a national accounting system of plant nutrients, (2) an economic and environmental assessment of the adoption of nitrogen inhibitors, and (3) estimating costs to producers of reducing agrichemical use in vegetable production.

In addition to RTD's research effort, staff have initiated jointly with the Commodity Economics Division (CED) a Sustainable Agriculture Seminar Series which has been quite successful, featuring speakers from universities, independent institutes, and from within ERS. RTD and CED staff collaborated on a Symposium on Measuring Sustainability at the AAEEA meetings with inputs from economists, sociologists, and agricultural scientists. RTD and CED are also collaborating on an ongoing basis in Agriculture in Concert with the Environment (ACE), EPA-CSRS funded cooperative research projects on sustainability.

#### **HIGHLIGHTS FROM "FARM BILL" SEMINAR SERIES**

The four-part seminar series titled "Designing the 1995 Farm Bill: Implications for Nebraska" concluded March 31. Single copies of the 70-page document containing the transcripts are available at no charge to those within Nebraska. Those outside of Nebraska may purchase a copy for \$10. We will send a copy of the executive summary to anyone at no charge. Contact the CSAS, sponsor of the series, for more information. The following are highlights from the executive summary written by series moderator, Dr. A.L. (Roy) Frederick, Professor and Extension Economist Public Policy in the UNL Department of Agricultural Economics.

Both presenters and participants in the seminars considered trade-offs that might occur. The consensus was that traditional farm price and income support provisions may be the first target of cuts. No one suggested, however, that price and income supports might be eliminated.

Everyone agreed that preserving natural resources was a high national priority. Such an emphasis began in the 1985 farm bill and was strengthened in the 1990 legislation. But budget concerns still dominate. Of particular concern, ten-year contracts under the Conservation Reserve Program (CRP), which has taken more than 35 million acres of mostly highly erodible land out of production, begin to expire in fiscal year 1996. Almost certainly, the federal government will not be willing to pay an equivalent annual "rental" fee on such land in the future, although most participants agreed that it would be in the national interest to keep much of this land out of crop production.

Questions were raised about the Wetlands Reserve Program, conservation compliance and other conservation-related measures. In the case of conservation compliance, some wondered whether price and income supports might be allowed to drift so low that farmers would leave the program, thereby effectively cancelling the government's ability to require conservation plans on highly erodible lands.

Everyone recognized that farm bills are the product of the political process, and with farm families now accounting for only about two percent of the population, it will continue to be necessary to form coalitions with other groups to pass acceptable farm bills. Food stamps and other food assistance programs provide considerable political grease to assure that farm bills receive appropriate attention. Equally significant, those with close ties to production agriculture also affirmed the importance of human resource provisions in farm bills on ethical grounds.

### **Natural Resources and the Environment**

Bob Warrick, chair of the Sierra Club agriculture committee, challenged seminar participants early on with this statement: "... the way commodity programs are structured is probably one of the most singularly destructive things to the natural environment that we have in rural Nebraska." He said the government encourages the same crops to be planted year after year, whereas diversity (crop rotation) should be the goal.

Jim Barr, an agricultural producer and agricultural and natural resources coordinator for Congressman Doug Bereuter, while not directly supporting Warrick's observation, said that perhaps commodity price and income support programs should focus more on good stewardship and less on production reduction.

Biodiversity is likely to be addressed in the next farm bill, according to Gary Hergenrader, head of the Department of Forestry, Fisheries and Wildlife at UNL. It already receives attention in the Endangered Species Act, but coordination would be enhanced by including it in the farm bill as well.

Terry Kubicek, deputy director, Natural Resources Commission, said there will be a limitation on how much government can demand in the way of conservation practices, e.g., terraces and waterways, without government cost-sharing at the federal, state and local levels. At the same time, Kubicek speculated that the pesticide record-keeping mandated by the 1990 farm bill may only be the tip of iceberg; in the future, environmentalists will insist that a record of fertilizer and irrigation practices be kept as well.

### **Animal Production Systems**

Steven Waller, a UNL faculty member and regional coordinator of USDA's Sustainable Agriculture Research and Education program, emphasized that the 12 states of the North Central Region have been aggressive about integrating animal agriculture into sustainable agriculture research programs, mostly through forages and livestock grazing. However, in a policy context, many people do not yet appreciate the value of livestock in sustainable systems.

UNL agricultural economist Maurice Baker focused his remarks on the one million acres of Nebraska land that could come back into crop production if the CRP is not continued. The relative prices of crops and feeder cattle would be important determinants of how much came back into crop production, as would the cost of meeting conservation compliance standards for crop production on highly erodible land. However,

Baker also posed this thought-provoking question: How many producers would feel comfortable with a livestock enterprise if they have not had one for several years?

Elton Aberle, head of the Department of Animal Science at UNL, observed that those in the poultry and swine industries as well as commercial feedlots have yet to address how their animals will fit into sustainable systems. However, there has been progress with ruminant animals that forage. Aberle believes it will be very difficult to generate the level of cash flow out of CRP land with a livestock grazing or haying operation that could be obtained from grain production.

State Senator Roger Wehrbein, who also farms and raises livestock, commented that if too much CRP land is used for cattle grazing, it could eventually reduce beef prices. Beyond that, in keeping with some of the economic and social aspects of sustainable agricultural systems, Senator Wehrbein questioned whether moderate-size producers will have difficulty finding open, competitive markets in the future. Perhaps, he said, the next farm bill should offer some sort of marketing agreements for those whose operations are not large enough to contract directly with handlers/processors.

#### Crop Production Systems

Randy Cruse, farmer and president of the National Corn Growers Association, also expects the 1995 farm bill to be more budget-driven than ever before. He asked participants whether a means test for program benefits might be acceptable. Another possibility, he said, is for program benefits to be decoupled from current production, perhaps with payments being made on a flat per acre basis.

Concern about the economic importance of pesticides prompted Earle Raun, president of PMC Pest Management Company, to advocate that some pesticides be made available in the future on a prescription basis.

Richard Clark, UNL agricultural economist, provided an overview of recent economic trends in Nebraska agriculture and linked those trends to government programs and regulations. He said we are facing trade-offs between short-run economics and long-run environmental viability of agriculture.

A pitch for alternative crops was the primary message of Robert Raun, farmer and former director of the Nebraska Department of Agriculture.

#### **Human Resources and Rural Communities**

Chuck Hassebrook, Center for Rural Affairs, expressed disappointment that all of the "people purposes" of the 1990 legislation had not been fully implemented. Sustainable agriculture research and extension are notable examples.

Based on his many years of professional work in the area of soil and water conservation, Tony Vrana said that to provide for sustainability in agriculture, we should tax those things which in the long run we want less of and subsidize other things we want more of.

Don Macke, director of the Nebraska Rural Development Commission,

shared two of his frustrations: (1) rural development needs and opportunities vary widely across the country and, therefore, federal initiatives must have more flexibility; and (2) overlap occurs among public agencies trying to do rural development work in Nebraska. For example, there are no less than six federal agencies with rural development initiatives in Nebraska.

Maxine Moul, Lieutenant Governor and chair of the Nebraska Rural Development Commission, echoed the "one size fits all" problem with federal programs. Even unemployment statistics mean something far different in Nebraska than on either coast. As delivery problems for rural development programs are addressed, she also would like to see more federal attention given to infrastructure, housing and micro-enterprise needs of rural communities.

Food assistance programs, including food stamps, account for a far larger share of the total cost of farm bills than is generally assumed, according to Roy Frederick, Extension public policy specialist at UNL. Commodity distribution programs at one time were nothing more than a way of disposing of excess government stocks; now, the primary purpose of these programs is to meet the nutritional needs of people. Speakers involved in administering food assistance programs expressed frustration with a federal bureaucracy that causes both government workers and assistance recipients to deal with multiple agencies with varying rules. Whether all welfare programs should be placed under a single agency at the federal level is a question that is currently being considered by a national welfare simplification committee. Some seminar participants worried more about efficiency than the political desirability of keeping most food assistance programs in USDA. Participants also learned about the role of churches and community-based agencies in providing food.

#### **RURAL POLICY SYMPOSIUM PROCEEDINGS**

On March 4, 1993 the UNL Institute of Agriculture and Natural Resources (IANR) hosted the rural policy symposium, "Implications of the New Research and Extension Dimensions of the 1990 Farm Bill." Among the presenters were: Duane Acker, immediate past Assistant Secretary for Science and Education, USDA; Terry Nipp, president of Aesop Enterprises (Washington, DC); Kathleen Merrigan, senior staff member of the U.S. Senate agriculture committee from 1987 to 1992; Chuck Hassebrook with the Center for Rural Affairs; and Chuck Schroeder, Nebraska representative to the Council for Agricultural Research, Extension and Teaching. Participants had the opportunity to ask questions of the speaker panel. The proceedings document from this symposium will be available in late June. IANR employees should contact John Allen (402-472-8012) for a copy of either the proceedings or the taped presentations. Others should contact the Rural Policy Research Institute, 131 Mumford Hall, University of Missouri, Columbia, MO 65211, 314-882-0316.

#### **SARE GRANT PROGRAMS**

The producer grant program is again being offered by the North Central Region Sustainable Agriculture Research and Education (SARE) Program.

Grants up to \$5,000 are awarded on a competitive basis to help producers overcome specific problems in converting to sustainable practices. Last year Nebraska producers received three of the 25 grants in the 12-state region. While producers need to lead and manage the projects, agents or specialists may be cooperators. The application deadline is July 15. For application forms or information, contact the SARE office, 207 Ag Hall, University of Nebraska-Lincoln, 68583-0701, 402-472-7081. Also, watch for this year's call for preproposals for SARE research and education grants the first week in July. If you would like to discuss the possibility of submitting a proposal for an interdisciplinary project through the Center for Sustainable Agricultural Systems, contact Chuck Francis, CSAS Director, at 402-472-1581.

### **SARE FUNDING - CHAPTERS 2 & 3**

Discussions during a May 5 conference call sponsored by USDA's Sustainable Agriculture Initiative Team centered on sections of the 1990 farm bill relating to funding sustainable agriculture activities. The following summary of the conference, was made available electronically by Jill Auburn with the Sustainable Agriculture Research and Education Program (SAREP) at the University of California-Davis.

Jim Bushnell, the leader of the team from the Extension Service, described the \$3 million earmarked for new sustainable agriculture activities in the President's budget for the USDA. Both Bushnell and Ferd Hoefner, Washington representative for a coalition of sustainable agriculture nonprofit organizations, expressed hope that the final figure might be even higher. The funds are expected to be used for Chapters 2 (Integrated Management Systems) and/or 3 (Education & Training) of the sustainable agriculture section of the 1990 farm bill, each of which is authorized for up to \$20 million in funding but has received no funding to date.

George Bird, Cooperative State Research Service director of the national Sustainable Agriculture Research and Education (SARE) program (Chapter 1 of the same farm bill), reported that the \$6.725 million that the program currently receives leverages approximately \$15 million more in matching funds from grant recipients. The National Sustainable Agriculture Advisory Council (NSAAC), appointed to advise the USDA on sustainable agriculture, holds its first meeting June 9-11 in Omaha, Nebraska. Administrative changes in the program include a change in the host institution for the Southern region SARE program from Louisiana State University to a new (as yet unannounced) site, and the appointment of a new director as Bird returns to his nematology position at Michigan State University in September. Despite the end of his two-year term as director, Bird will maintain his involvement in sustainable agriculture with CSRS at a 20% appointment. Of particular interest is the review of "sustainable agriculture relevancy" of research beyond the SARE program (e.g. research conducted by the Agricultural Research Service; research funded by the National Research Initiative), stimulated by Senator Daschle's hearings last September.

Jim Bushnell reported on the draft guidelines being developed for the administration of Chapters 2 and 3, if they are funded. Chapter 3 includes regional training centers for training extension workers and



other agricultural professionals, competitive grants for educational programs, and technical guides and handbooks. The training center funds would not be for "mortar and bricks," he emphasized, but would involve faculty from universities and nonprofit organizations throughout each region. Farmers and ranchers would be involved as teachers, and their farms might be satellite centers for the training. The ad hoc group developing the guidelines will be seeking broad input over the coming months.

While most of the several dozen participants in the May call were from universities, the quarterly conference calls are open to any and all participants on a first-come, first-serve basis (40 lines available). The dates and telephone number to call, along with other timely information and dialogue about sustainable agriculture, are shared through the computer electronic mail group "sanet-mg," accessible via the Internet computer network. The e-mail group is sponsored by the national Sustainable Agriculture Network (SAN) chaired by UC SAREP's Jill Auburn, and staffed by Gabriel Hegyes at the National Agricultural Library. For more information about SAN, contact Hegyes at 301/504-6425 (Internet: [ghegyes@nalusda.gov](mailto:ghegyes@nalusda.gov) ).

#### **SUSTAINABLE AGRICULTURE DIRECTORY OF EXPERTISE**

The CSAS has just received its copy of the above directory which lists hundreds of people and groups that can be contacted for advice on building soil health, broadening your arsenal of pest-control tools, diversifying cash flow and much more. According to the ATTRA (Appropriate Technology Transfer in Rural Areas) organization, which produced the directory in cooperation with the USDA's Sustainable Agriculture Network, it is the most thorough and comprehensive work of its type. The 300+ publication has seven indexes allowing the reader to search for information by state, individual, organization, crop/livestock enterprise, subject matter expertise, available product/service, and management service. The directory is available for \$14.95 from: Sustainable Agriculture Publications, Hills Building, Rm. 12, University of Vermont, Burlington, VT 05405.

#### **INTEGRATED FARM PROJECTS - ARDC**

The CSAS is coordinating the efforts of many researchers in several departments in establishing the Integrated Farm (IF) at the Agricultural Research and Development Center near Mead. Terry Klopfenstein, Charles Francis, Jim Brandle, Gary Lesoing and Dan Duncan are providing leadership for this program. Several research projects established previously by departments are being included as part of the IF. These include crop choice and cultural practice strategies to increase productivity of rotational patterns, contour strip intercropping and rotations to reduce soil erosion and energy costs, shelterbelt ecology the roles for windbreaks and other tree plantings in livestock protection, crop production enhancement, commercial harvest on a diversified farm, and long-term integrated beef production and crop production systems.

A project initiated in 1992 was a strip intercropping rotation of corn-grain sorghum-soybean, with different maturities and planting dates of each crop evaluated for their effect on crop yield. Following harvest,

calves were allowed to graze the crop residue from this experiment. Exclosures were placed in strips of each crop to measure the effect of grazing on bulk density and subsequent crop yields in 1993. An experiment conducted in cooperation with Biological Systems Engineering and the Cow/Calf Unit at the ARDC utilized two center pivot-irrigated fields. These fields will be in corn in 1993, so irrigated corn yields will be measured in grazed and ungrazed areas of the field.

A new experiment was initiated on the linear move irrigation system in 1992 to evaluate the effect of tillage system (disk-plant vs. ridge-till) on livestock and crop production. Corn stalks were grazed by calves under both tillage systems in the fall-winter of 1992. The muddy conditions early in the grazing season and the early snow cover reduced grazing days, particularly for the ridge-till system. Cattle gained .15 lb/day more on the disk-plant system compared to the ridge-till. Corn yields will be measured under both tillage systems for grazed and ungrazed areas in 1993. A six-year crop rotation of corn silage-wheat/turnips-corn grain-soybean-corn grain-grain sorghum-soybean or corn was implemented on the dryland acres of the IF. We included wheat in the rotation because it is grown on many farms in southeast Nebraska, provides diversity to the crop rotation, and is a good cash crop. Following wheat grain harvest, straw will be baled for livestock feed, and turnips will be planted to provide fall grazing for cattle. A new LISA-funded project will evaluate the effect of different strip cropping systems on erosion control. A wheat/soybean relay and double cropping experiment will be conducted on another field.

One of the most important goals of the Integrated Farm is to make more efficient use of the livestock wastes generated at the ARDC, based on numbers of livestock and a manure-crop balance. Assuming approximately 1200 dryland acres within the IF, 14 tons of animal wastes will be applied in two applications of 7 tons each in the six-year rotation. Manure from the dairy, feedlot, individual feeding barn, and the sheep unit will be composted. Residue for composting with the dairy and individual barn manure will be collected from around the ARDC, although we will be looking for other sources. The compost site is east of the swine lagoon, south of Highway 63. The benefits of a more stable and weed-free product were factors favoring composting. We will monitor costs of composting to determine economic feasibility.

Another project initiated in 1992 involved the integration of crops and livestock. The fate of nitrogen from manure and urine from livestock grazing throughout the fall and winter is being investigated. Little information is available on how much nitrogen is lost from animal wastes through the winter. We simulated a grazing situation during the fall and winter. Experiments such as these will continue in 1993 at different sites under various conditions. Results will provide a better understanding of nitrogen recycling in a crop-livestock grazing system.

In 1992 cattle grazed turnips on the forestry section. The effect of grazing and spring tillage on crop yield will be measured in 1993. Plans are to evaluate grazing within the windbreak system to determine this effect on cattle performance compared to cattle grazing in the unprotected fields. Forestry has also been conducting research on the effects of windbreaks on corn, grain sorghum, soybean, and wheat produc-

tion. Researchers in forestry and horticulture are evaluating wind-breaks and vegetable production (asparagus, cantaloupe, and cabbage).

Forestry, along with other agencies, is seeking funding to establish riparian buffer strips along the large drainage ditch that leads into Silver Creek and along the creek by the feedlot. Other possible projects for 1993 include: evaluation of different grass and grass mixture strips south of Silver Creek to determine which is most adapted to this site, and development of a swine waste utilization project. The swine waste project would involve use of waste water from the lagoon for irrigation and use of solid wastes from the lagoon for composting. This would require outside funding and cooperation with engineering, animal science, and agronomy. We are getting a good start on reaching our goals of the Integrated Farm, but we need to continue working together to meet these goals.

Submitted by Gary Lesoing

#### **STUDY OF FARM FAMILY HEALTH**

The following is excerpted from a release issued March 12, 1993 by the Pesticide Action Network North America Updates Service (PANUPS), which is a pesticide-related news service from the Pesticide Action Network (PAN) North American Regional Center located in California. For more information about the study or PAN, contact Pam Murray in the CSAS office.

Three national agencies are launching a project to monitor the health of farmers, farm workers, and their families, in what will be the largest agriculture-related health study ever undertaken in the U.S. The Environmental Protection Agency (EPA), National Cancer Institute (NCI), and the National Institute of Environmental Health Sciences (NIEHS) will collaborate on this project, which will last ten years, or longer if funding is available.

NCI comments that farmers are chronically exposed to "potentially harmful compounds such as pesticides. . .chemical solvents, engine exhausts, animal viruses, sunlight, and other substances common to agriculture." The new project should provide important data on the health effects of these exposures over time.

The project is a prospective epidemiological study (one in which an identified group, or cohort, is studied over a specified period of time) that will follow two cohorts of farm families: one in Iowa, and one in North Carolina. The project will include up to 100,000 people, including male and female farmers, farmers' spouses, agricultural pesticide applicators, and their children.

Prior studies have shown that U.S. farmers have higher-than-normal rates of several types of cancer. Past studies of farm health by NCI and other health monitoring agencies have generally been case-control studies, in which a selected group of "cases" of those manifesting a particular condition are compared with "controls," a selected group of those who do not have the condition under study. In launching a prospective study that will examine the cumulative health status of the farm cohorts over many years, investigators will be able to study many types of cancer and non-cancer health events in a consistent popula-

tion. Another advantage of a prospective study such as this is that it will gather information on health events and exposures as they occur. This eliminates some of the problems associated with retrospective health surveys that rely heavily on recall of past events.

#### **CONFERENCE ON SCIENCE AND SUSTAINABILITY**

The Western Region SARE Program and the Center for Sustaining Agriculture and Natural Resources at Washington State University are co-sponsoring "Conference on Science and Sustainability: Reshaping Agricultural Research and Education." It will be held October 24-26, 1993 in Seattle. The conference will focus on quantitative and qualitative methodologies for solving critical production, environmental and social problems associated with the establishment and continuation of sustainable agricultural systems. The program will feature innovative integrated research projects, nontraditional research and education methodologies, institutional strategies for increasing interdisciplinary research, and a poster session. For registration information, contact Norma Fuentes-Scott at 509-335-2921.

#### **DID YOU KNOW?**

The American Farmland Trust says the U.S. loses an average of 42,300 acres of productive farmland each week to development.

According to USDA, farmers used an estimated 95 million acre-feet of water for irrigation on nearly 53 million acres of farmland in 1992. Irrigated agriculture continues to dominate the use of water in the U. S., accounting for 81% of total consumption.

Exports of banned and hazardous pesticides from U.S. ports rose by 12% in 1991 compared to 1990 figures, according to U.S. government records analyzed by the Foundation for Advancements in Science and Education in the recently released study "Exporting Banned and Hazardous Pesticide, 1991 Statistics." The exports include the insecticide DDT, banned in the U.S. more than 20 years ago.



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