Scientific Cooperation between the United States and Central and Eastern Europe and the Newly Independent States

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Over the past 50 years, the scientific structure of the satellite countries of Central and Eastern Europe (CEE) and the Newly Independent States (NIS) followed the communist pattern of centralized control (Glenday, 1993). Policy decisions and research priorities were made at the top with little input from scientists or stakeholders. Because of the economic importance of the agriculture sector, agricultural research was often subject to a greater degree of centralized planning than theoretical fields of basic science.

Agricultural research in CEE and the NIS was conducted within three main structures: the academies of science; research institutes affiliated with the ministries of agriculture; and, to a lesser degree, within agricultural universities. Academies of science were honorary organizations comprised of eminent scholars. The academies wielded influence and power within the scientific community because they managed large budgets. Much of the theoretically based agricultural research came under the purview of academy scientists. The agricultural research institutes were designed to serve the needs of large state farms and cooperatives through the improvement of production agriculture. The research focus of these institutes was in applied areas such as plant and animal breeding, engineering and machinery design, aquaculture, and forestry. With some exceptions, the role of the agricultural universities was vocational education. Students attending universities were not adequately trained in research methods and seldom participated in active research programs. Interaction between universities, research institutes, and academies was minimal. Duplication of research was common, and multi-disciplinary projects were rare.

Though the current structure of agricultural science in CEE and the NIS continues to reflect that of the past, there have been some changes in recent years (Dragavtsev and Alexanian, 1993; Glenday, 1993; Jeffrey, 1994). First and foremost, funding for agricultural science at research institutes has been reduced dramatically. In the past, large communities—often up to 500 people—worked in field stations and agricultural research institutes. All of these people were paid by the

state. When the state systems were dismantled, hundreds of people at these research facilities and field stations lost their jobs. Most institutes immediately downsized by half and have since been forced to make further reductions. Though some lost jobs were superfluous or redundant, the collapse of these communities has affected the scale of scientific endeavor and the morale of the scientists who remained.

To generate revenues, many research institutes have become quite creative. It is now common to find institutes contracting out services for soil testing, seed production, plant breeding, vaccine development, artificial insemination, water analysis, etc. Some of these contracts are held with local farmers, while others are held with government ministries and the emerging private sector. International companies frequently contract with research facilities to support market development or related research and development.

Entrepreneurial scientists from the region are exploring every avenue to keep their research interests alive. For this purpose, they are looking to the agricultural research community in Europe and the United States for collaboration. This need provides a rare opportunity for the U.S. researchers to tap the energies of a well-trained pool of scientists for common benefit.

BENEFITS OF AND BARRIERS TO COLLABORATION

Benefits. The organizational and funding uncertainties within the agricultural research communities of CEE and the NIS offer increased opportunities for international collaboration. The eastward focus of the past has now shifted westward. Open borders have facilitated international travel in both directions. Germplasm collections are now accessible for study and exchange, and curators are eagerly searching for assistance in maintaining the collections. Moreover, U.S. and international donors have possessed the foresight to provide technical assistance funding at a crucial time to preserve and catalog germplasm collections in CEE and the NIS (Dalrymple, 1994; Dragavtsev and Alexanian, 1993; Strauss, 1994a).

In the horticultural sciences, years of active research and access to unique and indigenous germplasm from the region brings a wealth of knowledge to the field. Local researchers have published data on apricot (*Prunus armeniaca* L.) cultivars from Armenia (Arzoumanian et al., 1986), the North

Caucases (Dragavtseva, 1986), and Moldova (Isakova, 1986); plum (*Prunus* spp.) cultivars from Georgia (Bajashvili, 1990); blueberry (*Vaccinium* spp.) and cranberry (*Vaccinium macrocarpon* Ait) cultivars from Lithuania (Butkus and Butkiene, 1985) and other Eastern European countries (Pliszka, 1993); and walnut (*Juglans* spp.) cultivars from Ukraine (Andrienko et al., 1990) and Moldova (Tsurkan and Melnichenko, 1990). Other researchers have published data on cherry (*Prunus avium* L.) production in Eastern Europe (Bulatovic-Danilovich, 1993) and on tomatoes (*Lycopersicon esculentum* Mill.) for industrial processing (Andryushchenko and Shilina, 1990). With funding from the U.S. Dept. of Agriculture, Cornell Univ. scientists travelled to Kazakhstan and Kyrgyzstan to collect apple (*Malus domestica* Borkh.) germplasm (Adams, 1994). A list of the national coordinators for the European cooperative program for conservation and exchange of crop genetic resources is available for further reference (Strauss, 1994b).

Two major factors prevalent in CEE and NIS countries make collaboration in the region very attractive for U.S. scientists and institutions. First, the scientists from CEE and the NIS are well-trained. Though a lack of access to current literature and technologies has impeded scientific development in some fields, CEE and NIS scientists have received a strong theoretical education. Second, collaboration with CEE and NIS countries is very cost-effective. Salaries of scientists are very low, ranging from \$50 to \$300 per month. Even if an incentive salary is added to this base salary, the cost of supporting scientists for research collaboration remains quite low. Therefore, it is possible to fund the research efforts of an entire laboratory for 1 year on the equivalent yearly salary of a research assistant or postdoctoral associate in the United States.

Barriers. There are, however, challenges to overcome when initiating joint research efforts. In any international collaboration, communication plays a pivotal role in establishing an effective relationship. In CEE and the NIS, communication is made difficult by several factors, in addition to the obvious language and cultural differences. Economic hardships and past fears of uncontrolled communication have hindered the development of telecommunication infrastructure in the region, creating a barrier to efficient uses of phone, fax, and Internet services. Computers and fax machines are usually shared by entire research departments, if they exist at all. Yet, improved telecommunication is a high priority for the new

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governments of CEE and the NIS, and acquisition and installation of new technologies are proceeding rapidly. Many scientists in the region are gaining access to the Internet, particularly in urban centers.

One of the most subtle, yet frustrating, barriers to cooperation is corruption. Low salaries, high consumer prices, and the total collapse of law enforcement and judicial oversight has culminated in varying degrees of corruption throughout the region. Scientists may be affected by corruption either directly or indirectly: scientific equipment is stolen or sold for profit, bribery and protection money is demanded, funds are siphoned off for personal use. We hope that these problems are temporary, resulting from the challenges of transforming a centrally planned economy to a decentralized, privatized economy.

Wagner (1993) has outlined the pros and cons of undertaking international technology-based joint ventures. Although the article focuses primarily on commercial joint ventures, the steps outlined for planning and evaluating the prospects for a successful joint venture are readily applied to planning for international research collaboration. Included in her discussion are a six-phase strategic approach and criteria for decision-making that are relevant to international research and development. Scientists who have an interest in international collaboration would be well-served to review this article for planning purposes.

SOURCES OF FUNDING FOR COLLABORATION

The U.S. government has developed a strategy for assistance to CEE and the NIS based on

four major components: democracy, privatization, health, and environment (U.S. Dept. of State, 1994). The assistance effort has been designed to achieve visible results in a short period. It was widely believed that CEE countries would need U.S. assistance for 3 to 5 years to complete the transition from communism to capitalism. While the early assumptions held true for countries such as the Czech Republic, Slovenia, and Estonia, it has become apparent that the CEE assistance effort will continue in most countries in the region well into the 21st century. Funding for NIS assistance efforts remains quite political, although multiyear programming is currently under way. There is no doubt that countries such as Russia, Ukraine, and Belarus have different assistance requirements than Moldova, Georgia, and the Central Asian Republics.

The primary agency responsible for strategic development and technical assistance funding to the CEE and NIS is the U.S. Agency for International Development (AID). Congress authorized funding for technical assistance to the CEE and NIS under the SEED Act and the FREEDOM Support Act, respectively. Congress appropriates funds on a yearly basis to AID under this authorizing legislation. AID has the responsibility to disburse funds to public, private, and nonprofit organizations to implement technical projects in the region. Interagency assistance efforts in CEE and the NIS are coordinated by the Office of the Coordinator in the U.S. Dept. of State.

The assistance strategy developed by AID and the Office of the Coordinator does not support using SEED Act and FREEDOM Support Act funding for collaborative research

between U.S. scientists and scientists from CEE and the NIS. Some funds have been allocated to agricultural research institutions in CEE and the NIS, but they are earmarked solely for policy reform and restructuring. The general rationale for excluding the research community from technical assistance funds is based on the short-term nature of the assistance effort. Research funding is perceived by AID and the State Dept. to be a long-term rather than short-term investment. Moreover, scientific research was well-funded in the past, and some believe that present research needs can be adequately met by restructuring and reallocating existing human and financial resources.

Table 1 provides a list of potential funding sources for agriculturally related scientific cooperation between U.S. scientists and scientists from CEE and the NIS. The list has been drawn from various sources, including informational letters, pamphlets, and brochures distributed by various funding organizations.

The list in Table 1 is exemplary, not comprehensive, and includes U.S. Government programs and sources from private foundations and technical societies. The U.S. Government-funded programs existed before SEED and FREEDOM Support Act funding, albeit at comparatively lower funding levels. Most notably, the U.S. State Dept.'s Joint Fund programs in CEE are absent from this list. As of fiscal year 1996, it is likely that funds for these programs will cease due to U.S. budget reductions.

Thus, it can be concluded that collaboration between U.S. scientists and scientists from CEE and the NIS provides mutual benefits that extend beyond the accomplishment of shared

Table 1. Funding sources for scientific cooperation between the United States and Central and Eastern Europe and the Newly Independent States.

Name and address of donor agency	Grant area	Amount/grant	Duration	No. awards (per year)	Deadline
American Orchid Society 6000 South Olive Ave. West Palm Beach, FL 33405-4159 Tel: 407.585.8666 Fax: 407.585.0654	Orchid research	\$500-\$12,000	≤3 years	Not specified	1 Jan. and 1 Aug.
Conservation, Food, and Health Foundation c/o Grant Management Assoc. 230 Congress St., 3rd Floor Boston, MA 02110 Tel: 617.426.7172 Fax: 617.426.5441	Projects on conservation, ecology, environment, wildlife, agriculture, health, health services	\$10,000-\$25,000	Not applicable	25-30	1 Jan. and 1 Aug.
Council for International Exchange of Scholars Fulbright Scholar Program Director Recruitment and Liaison 3007 Tilden St., NW, Suite 5M Washington, DC 20008 Tel: 202.686.4000 Fax: 202.362.3442	Basic and applied field research in the sciences and humanities, university teaching, advanced research, graduate study, and teaching in elementary and secondary schools	Stipend, travel, miscellaneous allowances	2-12 months	More than 1,000 teaching and research awards in about 135 countries	15 June-1 Aug., varies with country
CRPB Program Proposal Services Branch CSREES U.S. Dept. of Agriculture AG Box 2241 Washington, DC 20250 Tel: 202.401.4871 Fax: 202.401.6488	1. Multi-institutional Research Group Awards Research in all areas of plant biology; DOE/NSF/USDA joint program 2. Interdisciplinary Research Training Group Awards Interdisciplinary research in plant biology; DOE/NSF/USDA joint program	About \$60,000/year About \$300,000/year	≤5 years ≤5 years	Not specified Not specified	Not specified Not specified

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Table 1. Continued.

Name and address of donor agency	Grant area	Amount/grant	Duration	No. awards (per year)	Deadline
Fertilizer Research and Education Program Contracts Office, Room 155 California Dept. of Food and Agriculture 1220 N St. Sacramento, CA 94271-0001 Tel: 916.653.5340 Fax: 916.653.2407	Research, demonstration, and education of environmentally safe and agronomically sound use and handling of fertilizer materials	Maximum \$30,000	Multi-year projects accepted, funding only guaranteed for 1 year	Not specified	April
Food and Agriculture Organization of the United Nations Liaison Office for North America 1001 22nd St., NW Washington, DC 20437 Tel: 202.653.2453 Fax: 202.653.5760	1. Fellowships and scholarships Agriculture, fisheries, forestry, nutrition, agricultural economics and statistics, rural institutions and services, and related areas	Stipend, training fees, travel, books, tuition	2 months–2 years	Not specified	Not specified
	2. Group Training Activities Animal production and health, atomic energy, economic analysis, fisheries, forestry and forest products, land and water development, nutrition, plant production and protection, public information, rural institutions and services, and statistics	Cost of the course	2 weeks–6 months	Not specified	Not specified
	3. Andre Meyer FAO Research Fellowships Agriculture, fisheries, forestry, nutrition, agricultural economics, and statistics	Stipend, training fees, travel	24 months	four, offered biannually	Not specified
Horticultural Research Inst. Suite 500, 1250 I St., NW Washington, DC 20005 Tel: 202.789.2900 Fax: 202.789.1893	Production, marketing, and landscape applications of woody landscape plants	Maximum \$15,000	1 year, renewable	Not specified	1 May
Institute of International Education Hubert H. Humphrey Fellowship Program 1400 K St., NW Washington, DC 20005 Tel: 202.326.7701 Fax: 202.326.770 e-mail: hhh@iie.org	For mid-career professionals from developing countries, Eastern and Central Europe, and the former Soviet Union to pursue a year of study and related practical professional experience in the United States in fields of natural resources and environmental management, agricultural development/economics, health and nutrition, and public administration	Travel, tuition, stipend, books, professional activities	1 academic year	150–200	Variable by country; final deadline 15 Nov.
International Research and Exchanges Board (IREX) 1616 H St., NW Washington, DC 20006 Tel: 202.628.8188 Fax: 202.628.8189	1. Individual advanced research opportunities for U.S. faculties and doctoral candidates Individual and collaborative research and intellectual exchanges in Central and Eastern Europe, the former Soviet Union, and the People's Republic of Mongolia in unrestricted fields	Travel, stipend, research allowance, support for accompanying family may be available	2–12 months	Grants awarded in 1993–94: CEE, 57; Eurasia, 48; Mongolia, 3	November for following September
	2. U.S. host universities for graduate students from Eurasia and the Baltics (Edmund S. Muskie and Freedom Support Act Fellows) 1- to 2-year degree and nondegree programs in professional fields	Travel, book, partial tuition, living expenses health insurance	1–2 years	About 150	January for following fall
Life Sciences Research Foundation Postdoctoral Fellowship Program c/o Lewis Thomas Laboratories Washington Rd. Princeton Univ. Princeton, NJ 08544 Tel: 609.258.3551	Training and support for young scientists in life sciences	\$35,000/year covers stipend, travel, research expenses	3 years	15–20	1 Oct.
National Research Council Office for Central Europe and Eurasia 2101 Constitution Ave., NW Washington, DC 20418 Tel: 202.334.2644	1. Twinning Program Funds basic research between U.S. and CEE scientists (no production agriculture research) in Belarus, Bulgaria, Kazakhstan, Moldova, Romania, and Ukraine	\$12,000–\$15,000 Covers travel, scientific supplies, miscellaneous costs	2 years	Not specified	1 Sept.

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Table 1. Continued.

Name and address of donor agency	Grant area	Amount/ grant	Duration	No. awards (per year)	Deadline
Fax: 202.334.2614	2. COBASE Travel/Host Grants Funds short-term and longer-term collaborative basic research (no production agriculture research) between U.S. scientists and scientists in CEE and the NIS	\$2,200–\$2,500 short term; \$3,000–\$15,300 long term	≤6 months	Not specified	29 Dec., 8 Apr., 8 July, 5 Aug.
National Research Council 2101 Constitution Ave., NW Washington, DC 20418 Tel: 202.334.2760 Fax: 202.334.2759	Resident Research Associateship Programs GR430 All areas of theoretical and applied fundamental sciences, including health sciences, clinical research, environmental sciences, plant physiology, and biotechnology	\$29,000–\$35,000 for research associates, higher stipend for senior associates, relocation reimbursement, professional travel	12 months	300	15 Jan., 15 Apr., and 15 Aug.
Scientific Cooperation Program USDA/FAS/ICD/RSED Room 3230 South Building Washington, DC 20250 Tel: 202.720.3282 Fax: 202.690.1955 e-mail: hneil@ag.gov	International agricultural research of high priority to the United States, particularly biological control, forestry, exotic diseases and pests, germplasm, human nutrition, new uses, trade barriers, and natural resources management	\$5,000–\$30,000 travel, stipend, insurance, equipment, publication	4 weeks–3 years	About 50 (short term and long term)	September of the preceding fiscal year
Stanley Smith Horticultural Trust P.O. Box 365 Cambridge CB2 1HR, U.K. Tel: 44.223.336299 AM 44.223.60100 PM Fax: 44.223.336278	Amenity horticulture and horticulture education	Varies	Depends on the nature of the project	Varies	15 Mar., 15 Sept.
The Charles A. Lindbergh and Anne Morrow Foundation Lindbergh Grants Program 708 South 3rd St., Suite 110 Minneapolis, MN 55415 Tel: 612.338.1703 Fax: 612.338.6826	Agriculture, aviation/aerospace, arts and humanities, biomedical research, conservation of natural resources, exploration, health and population sciences, intercultural communication, oceanography, waste disposal management, water resource management, and wildlife preservation	≤\$10,580	Not specified	10	Second Tuesday in June
The Eurasia Foundation Program Office 1527 New Hampshire Ave., NW Washington, DC 20036 Tel: 202.234.7370 Fax: 202.234.7377	Educational programs, expert advice, training, and policy research to support economics and democratic reform in the Newly Independent States (NIS)	Total \$16 million/year Average U.S. grant: \$60,000; Average NIS grant: \$25,000	Not specified	According to the annual budget	Not specified
The Ford Foundation 320 East 43rd St. New York, NY 10017 Tel: 212.573.5000 Fax: 212.599.4584	Rural development, environment, agriculture	Variable	Not applicable	Not specified	None
The International Society of Arboriculture-Research Trust Dept. of Botany and Microbiology Ohio Wesleyan Univ. Delaware, OH 43015 Tel: 614.368.3508 Fax: 217.355.9516	Research on shade and landscape trees	\$2,500	Not applicable	10	1 Nov., 15 Apr.
The Kosciuszko Foundation 15 East 65th St. New York, NY 10021 Tel: 212.734.2130 Fax: 212.623.4552	1. Graduate and Postgraduate Study in Poland For Americans to continue their graduate and postgraduate studies in Poland 2. Exchange Program with Poland For Poles to further their research studies at accredited institutions of higher learning in the United States	Tuition, stipend Travel, stipend, books, insurance	Not specified 1 year	Not specified Not specified	15 Jan. 15 Oct.
Wallace Genetic Foundation 4900 Massachusetts Ave., NW Suite 220 Washington, DC 20016 Tel: 202.966.2932 Fax: 202.362.1514	Agriculture, conservation, environment, higher education, nutrition	\$150,000	Not applicable	Not specified	Not specified

research objectives. International collaboration has far-reaching benefits such as access to biological material, scientific resources, and technologies unavailable in the United States (Herd, 1986; Ruttan, 1986). Despite the challenges affiliated with international cooperation, there is a great potential in developing collaborative research programs. With high levels of interest from CEE and NIS scientists and catalytic funding available through numerous organizations and agencies, it is quite feasible to pursue cooperative research efforts with scientists in the region.

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