

U.S. Department of Agriculture Annual Reporting on Agency Technology Transfer¹

I. Agency tech transfer programs and role in achieving agency mission

Principles, Modes, and Plans

Agricultural Research Service (ARS) has been delegated authority by the Secretary of Agriculture to administer the patent and license programs for USDA. The ARS Office of Technology Transfer (OTT) is assigned the responsibility for protecting intellectual property, developing strategic partnerships with outside institutions, and performing other appropriate functions that enhance the effective transfer of ARS technologies to users. To accomplish this, OTT is organized around four broad function areas. The *Administrative/Headquarters Section* conducts the day-to-day operations, coordinates the development of Technology Transfer (TT) policy, and signs licenses and Cooperative Research and Development Agreements (CRADAs). The patent advisors (PAs) and the *Patent Section* assist scientists in protecting intellectual property (IP), coordinate Invention Reports (IRs), prepare and prosecute patent applications, and oversee any patent applications prepared by contract law firms. The *Licensing Section* conducts targeted marketing for selected ARS technologies and negotiates licenses for ARS Intellectual Property. The *Marketing Section* coordinates the targeted marketing and distributes information on ARS technologies that are available for licensing or cooperative partnerships, provides answers to stakeholder questions on TT in ARS, and ensures that information about the commercial successes of ARS research is made available to the public. These objectives are accomplished via written information, reports to stakeholders, trade shows, the ARS Information Staff (IS), the National Agricultural Library, and electronic media. Technology Transfer Coordinators (TTCs) are located in the field and have overall responsibility to assist in any way possible to facilitate the development and effective transfer of USDA technologies. They serve as liaison with scientists, line and program managers in ARS, university partners, users, and the private sector, they also negotiate CRADAs, other TT agreements and some licenses.

¹In response to the requirements of the Technology Transfer and Commercialization Act of 2000 data elements of the agency annual reports.

II. Activity / Performance Measures

Collaborative Relationships for Research, Development, & Demonstration (RD & D)

CRADAs

Total No. Active CRADAs (as of 9/30/01)	Number of new CRADAs executed in FY 2001	Total number of active, "non-traditional" CRADAs (as of 9/30/01)	Number of new "non-traditional" CRADAs executed in FY 2001
219	49	0	0

Other Types of Collaborative R,D&D Relationships

Cooperative research and technology transfer are also effected through Trust Fund and through Reimbursable Agreements. In FY 2001, the Office of Technology Transfer was instrumental in negotiating 106 such agreements.

Intellectual Property Management

Invention Disclosure and Patenting

No. of invention disclosures in FY 2001	No. of patent applications filed in FY 2001	No. of patents issued in FY 2001
118	83	64

Licensing

Invention Licenses (includes U.S. Forest Service)

Total no. of invention licenses active during FY 2001	No. of new invention licenses signed in FY 2001
255	32

Licenses for "Other IP"

Total number of active licenses for "Other IP" in the FY = not applicable

Other Characteristics (Does not include U.S. Forest Service)

1. Total No. of active licenses in USDA receiving income in FY 2001 (120)		
Exclusive	Partially Exclusive	Non-exclusive
78	19	23

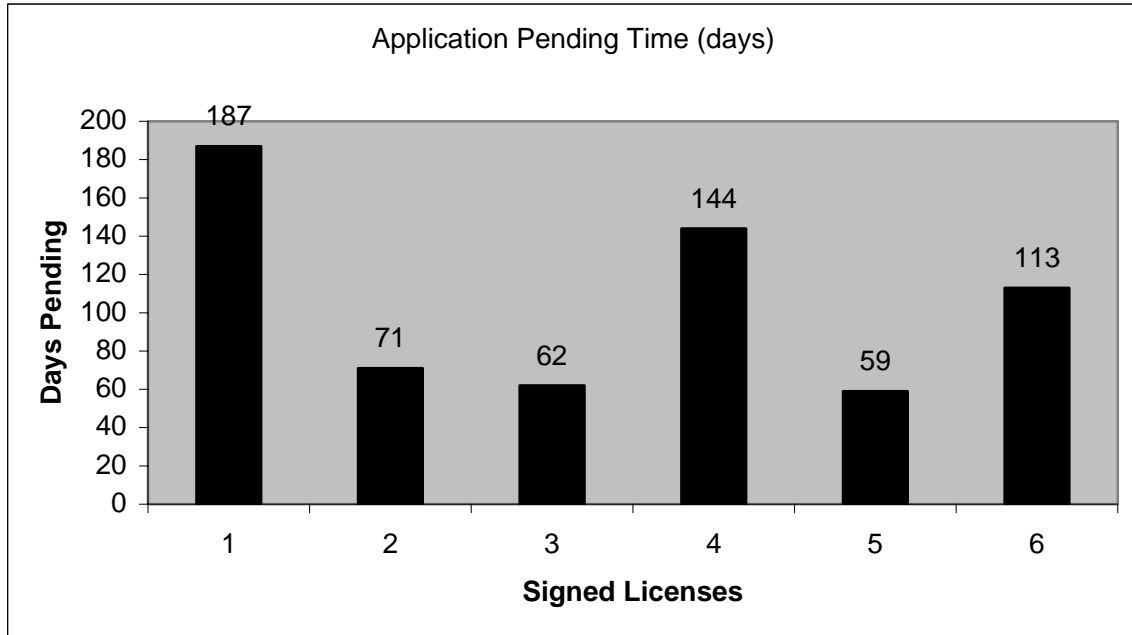
2. Number of licenses terminated for cause in FY 2001 = 1

3. Elapsed time from date of (formal) license application to date of license execution

Explanatory comments:

During FY 2001, ARS received 32 new patent license applications, for which 6 new licenses were granted. Of the remaining 26 applications, 2 license applications were withdrawn by the applicants, 16 licenses are currently in negotiation, and 8 are on hold as requested by the applicants. The data presented for the 6 new licenses (accompanying graph on next page) do not include any licenses granted in FY 2001 for which applications were received in prior fiscal years, because ARS did not begin tracking this data until October 1, 2000.

Time elapsed for the licenses granted in FY 2001, for which the patent license application was received in FY 2001 (6)



License 1- Co-Exclusive
 License 2- Non-Exclusive
 License 3- Exclusive (joint owner)

License 4- Co-Exclusive
 License 5- Non-Exclusive
 License 6- Exclusive

Income (Does not include U.S. Forest Service)

Income from Licenses Active in FY 2001

Total income from all licenses active during FY	Income from invention licenses active during FY	Income from "Other IP" licenses
\$2,622,000	\$2,622,000	Not applicable

Disposition of License Income (all fees, royalties, and reimbursement of expenses)

Inventor awards	Salaries of some technology	Patent filing preparation, fees, and patent	Other technology transfer expenses

	transfer staff	annuity payments	
\$681,700 (26%)	\$1,075,000 (41%)	\$707,900 (27%)	\$157,300 (6%)

Details on Earned Royalty Income (ERI) for FY 2001 (Based on 56 licenses)

Total Earned Royalty Income (ERI)	Range of ERI values across all royalty bearing licenses	Median ERI value	ERI subtotals		
			top 1% of licenses	top 5% of licenses	top 20% of licenses
\$1,409,252	\$78 to \$563,320	\$5,723	Not presented (1 license)	\$723,167	\$1,109,051

III. Information about Tech Transfer Outcomes

Selected Examples of Tech Transfer Outcomes in FY 2001

1. **Dragonfly™** is an insect trap that effectively attracts and kills mosquitoes and biting flies. The technology, which became commercially available in 2001, represents an environmentally-friendly alternative to chemical pesticides for mosquito control and broadly supports increasing public interest in less toxic pest management practices. The final product was a result of a CRADA between ARS' Center for Medical, Agricultural, and Veterinary Entomology (Gainesville, Florida) and BioSensory, Inc. (Willimantic, Connecticut).
2. An artificial diet and diet-based insect rearing system that allows producers to rear beneficial insects at reduced costs was successfully transferred to commercial producers. As a result, these beneficial insects can now be produced in large-scale production for the first time. The technology was transferred as a result of a CRADA between ARS' Biological Control and Mass Rearing Research Unit (Mississippi State, Mississippi) and Beneficial Insectary (Redding, California).
3. **AquaVac-ESC™** became the world's first approved, licensed, and manufactured live fish vaccine. The vaccine prevents enteric septicemia (ESC) caused by *Edwardsiella*. ESC is a major catfish disease that costs farmers as much as \$60 million a year in losses. This new

vaccine will help the catfish industry solve a key problem and provides producers with a more cost-effective way to raise healthy fish for consumers. The technology resulted from a CRADA between the ARS Aquatic Animal Health Research Laboratory (Auburn, Alabama) and Intervet, Inc. (Millsboro, Delaware). In 2001, Intervet first launched AquaVac-ESC™ and sold about 300 million doses to catfish farmers in the Mid-South area.

4. Three ARS-developed soybean varieties, with plant variety protection patents, licensed to three different companies reported revenues from sales in FY 2001. Derry, Donegal, and Tyrone are the first improved forage-type soybean cultivars bred for animal feed. These new varieties can be used for grazing, hay, or silage over a wide geographic area of the United States. The varieties differ in maturity dates, disease resistance, and areas where they will grow best. Donegal matures earliest and is suited to the Northeast; Derry matures later and is ideal for the Midwest, and Tyrone matures last and is best for the South.
5. ARS made 46 plant germplasm releases to U.S. farmers, nurseries, breeders, and researchers to help speed transfer of those technologies to the public. These releases included a new citrus rootstock, and new wheat, dry pea, potato, soybean, chickpea, lentil, grape raisin, blueberry, small dry beans, and plum varieties; as well as several new germplasm lines--sunflower, corn, sugar beet, sweet potatoes, and cotton--with enhanced or improved qualities.
6. In a unique technology transfer effort, two USDA agencies (the Agricultural Research Service and the Animal and Plant Health Inspection Service) and the Florida Department of Agriculture and Consumer Services setup a five-year initiative to help U.S. southern states combat Red Imported Fire Ants, which have increased exponentially since their arrival from South America in the 1930s. Under the initiative, Florida's Department of Agriculture and Consumer Services will mass-rear *Pseudacteon tricuspis*, a phorid fly species that specifically parasitizes fire ants. The flies then will be shipped to field sites for release in southern states including Florida, Georgia, North Carolina, South Carolina, Louisiana, Mississippi, Texas, Alabama, Arkansas, Oklahoma, and Tennessee. ARS researchers brought the tiny fly to their U.S. quarantine facilities several years ago from Brazil, and have since mastered biological control strategies using the fly to control fire ant populations.
7. ARS has participated in numerous outreach activities to help inform industry about Agency objectives, programs, services, and information resulting from ARS research. In a pivotal event for the State of Maryland and USDA, ARS, the Maryland Technology Development Corporation, and the Prince Georges Economic Development Corporation signed a Memorandum of Understanding aimed at fostering economic development in Maryland and to help transfer ARS technologies to the public. The event resulted in a cooperative agreement between ARS and Intralytix of Baltimore, Maryland, to further investigate food safety. In addition, two more cooperative agreements are under negotiations. The Office of Technology Transfer (OTT) has participated in several industry and professional meetings to present new technologies available for licensing and partnering opportunities. OTT has

developed and implemented "Technology Alerts" and other strategies for its industry customers to introduce new technology opportunities.