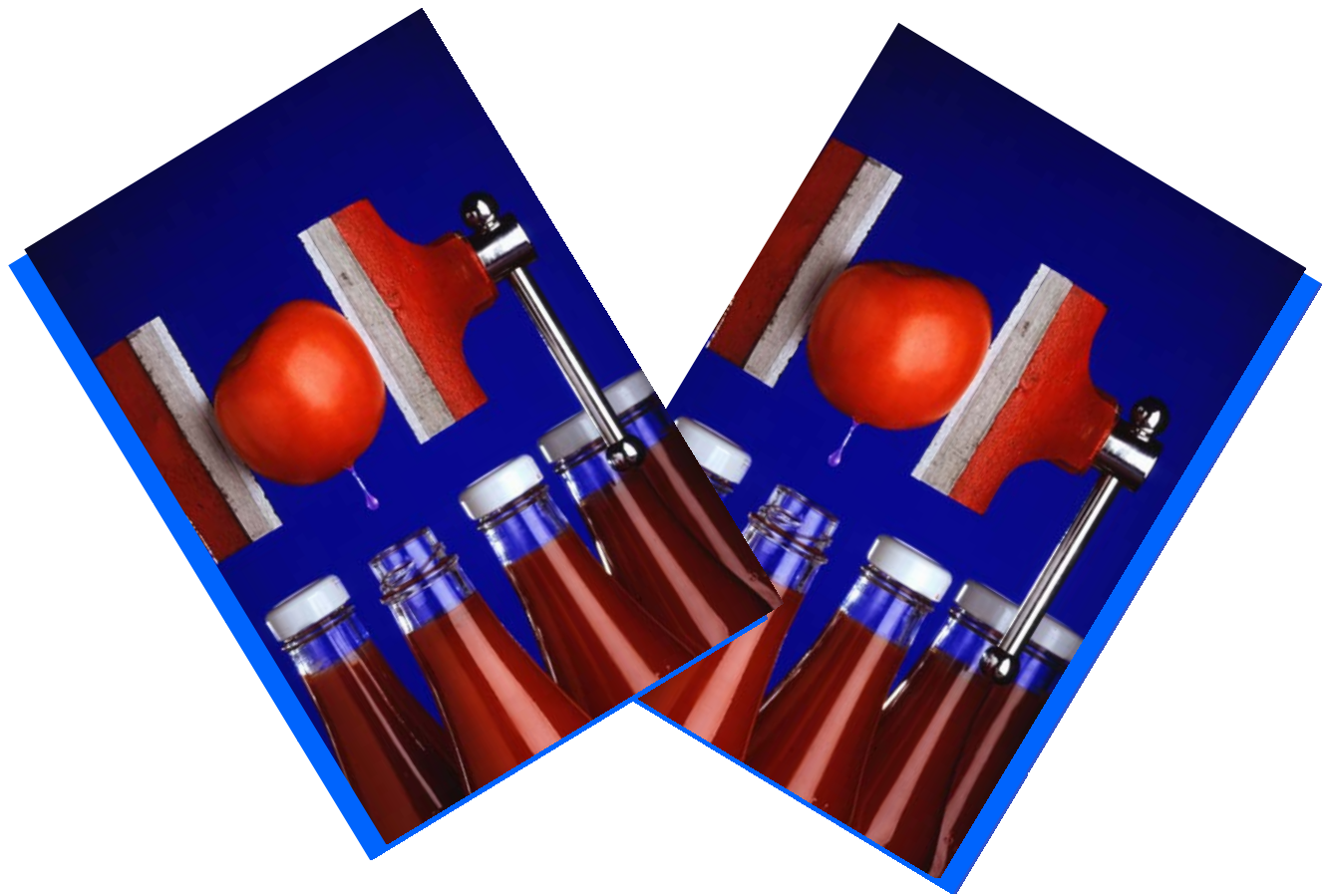


U.S. Department of Agriculture

FY 2002 Annual Reporting on Agency Technology Transfer



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I. Agency Approach and Plans for Technology Transfer

Tech Transfer Principles, Modes, and Plans

The Agricultural Research Service (ARS) has been delegated authority by the Secretary of Agriculture to administer the patent and license programs for the U.S. Department of Agriculture (USDA). ARS's Office of Technology Transfer (OTT) is assigned the responsibility for protecting intellectual property, developing strategic partnerships with outside organizations, and performing other appropriate activities that effectively transfer ARS technologies to the marketplace.

To accomplish this, OTT is organized into four areas. The *Administrative/Headquarters Section* conducts day-to-day operations, coordinates technology transfer policy development, and signs licenses and Cooperative Research and Development Agreements (CRADAs). Patent advisors in the *Patent Section* assist scientists in protecting intellectual property (IP), coordinate invention reports, prepare and prosecute patent applications, and oversee any patent applications prepared by contract law firms. The *Licensing Section* negotiates licenses for ARS IP and monitors license performance. The *Marketing Section* develops, implements, and coordinates targeted marketing strategies to facilitate technology transfer, distributes information on ARS technologies that are available for licensing or cooperative partnerships, provides answers to stakeholder questions on technology transfer activities in ARS, and ensures information about ARS research commercial successes is available to the public.

These objectives are accomplished by written information—including reports to stakeholders, briefings, and other collateral materials—trade shows, technology showcases, meetings with industry organizations and universities, workshops, the ARS Information Staff, the National Agricultural Library, and electronic media. ARS has seven Technology Transfer Coordinators (TTCs) stationed across the United States who are responsible for facilitating the development and transfer of USDA technologies. They serve as liaisons with scientists, ARS managers, university partners, and the private sector. They also negotiate CRADAs, other technology transfer agreements, and some licenses.

Since our mission is to transfer technologies to the private sector for broad beneficial public use, we pursue patents and licensing only when IP protection is essential for technology transfer.

¹In response to the requirements identified for the annual “agency report on utilization” by 15 USC Sec. 3710 (f)(2).

This is usually the case when further research and development (R&D) investment by the private sector is necessary to commercialize a product, and patent protection is required to protect this investment. ARS holds periodic patent review committee meetings to review invention disclosures and make recommendations to the Assistant Administrator on whether a patent is necessary and practical (sufficient scope, enforceable, appropriate for the size of the market, etc.).

ARS has other unique mechanisms that help technology transfer efforts. ARS's Information Staff generates several electronic products—some in both English and Spanish—which boasts 7,000 subscribers including 2,373 daily news subscribers; 1,651 weekly news subscribers; 1,363 subscribers to the Food and Nutrition Research Briefs; 766 subscribers to the Healthy Animals newsletter; 880 subscribers to lists for kids—Science-4-Kids (English) and Ciencia Para Niños (Spanish). An estimated 1,200-plus news media, 300-plus extension agents, farmers, scientists, educators, corporations, nonprofit organizations, and students subscribe to ARS's news feed. Most, if not all, of ARS's major stakeholders, i.e. commodity groups, scientific organizations, etc., receive information from ARS on a regular basis.

ARS research also continues to have worldwide interest. Agricultural Research Magazine, ARS's monthly science publication written in laymen's language, is distributed to more than 40,000 people nationally and internationally. In addition, at least 58 foreign countries subscribe to our news list.

Other mechanisms of technology transfer include submitting more than 4,000 articles on recent research findings scientific, trade journals, and other publications releasing germ plasm to the public, and conducting public field days at various ARS locations. Our policy is to allow researchers and breeders to use any ARS technology freely, without a license for research purposes.

OTT has expanded its technology transfer base through several new initiatives and programs during this fiscal year:

- Tech Alerts is a self-subscribing Web-based system that allows businesses to receive notifications when new technologies are available for licensing. In this unique effort, we send businesses information about technologies shortly after patent applications are filed, which allows companies to sign confidentiality agreements and get involved in cooperative partnerships or licensing early. This service helps keep ARS research in the minds of key industry contacts, helps us to reach a broader audience at no extra cost, and it helps in the decision-making process when seeking foreign patent protection. Most new subscribers are actively sought at tradeshow, industry meetings, workshops, and targeted mailings. As a result of these efforts, the list, which started with 105 members in July 2001, now has more than 719 subscribers.

- Other Web-base services are designed to assist the agency in finding potential CRADA partners to complete the process of R&D and commercialization of ARS-generated ideas. One such service is a feature currently under development for our new Web site, which will highlight partnering opportunities for businesses. In addition, our agency is adding a “Partnering Page,” which should help companies quickly find and identify research partnering opportunities, technologies available for licensing, and other technology transfer information.
- Customized marketing letters are sent to companies to inform them about technologies that may be of interest to them. OTT has developed a marketing database that includes key industry contacts and data from a variety of industries. The Marketing Information Database will allow us to track marketing efforts and outcomes of specific technologies.
- Technology showcase exhibitions continue to be held periodically at selected ARS locations. These 1-day events provide a venue for corporations and federal scientists to meet and discuss selected technologies available for licensing or research projects where private sector partnership is desired. They also offer businesses the opportunity to see a particular technology first hand and to gather more information on the commercial potential of a particular technology. Several CRADAs have resulted from these showcases.
- Small businesses are invited to participate in special workshops, meetings, and site visits to facilitate development of emerging businesses. OTT held a two day workshop designed to help small, minority-, and woman-owned businesses understand the process of identifying and accessing ARS technologies, scientific expertise, and other federal, state, and local resources.

Information on Agency Plans for Strengthening its Performance Metrics

In the late 1990’s, ARS experienced a bottleneck in processing patent applications. Additional Patent Advisors were hired to reach our current level of nine. By 2000 the licensing section that consisted of one full-time licensing specialist became overburdened with pending license applications. ARS began training Technology Transfer Coordinators and hired a new licensing specialist to negotiate license agreements. In the fall of 2001, OTT received authority to hire two additional personnel in the licensing section. They reported to duty in April and May of 2002 and began addressing the backlog.

In part because of the new congressional annual reporting requirements initiated in FY 2002, ARS authorized development of a new licensing database and tracking system to be incorporated into the Agency database called ARIS (Agricultural Research Information System); that process was initiated in October, and will be completed during FY 2003.

Beginning in FY 2003, we began developing systems to track Plant Material Inventions and Biological Material Inventions to supplement the existing Patent Invention tracking system.

This will allow ARS to evaluate merits of public release versus intellectual property protection (Plant Variety Protection Certificates) for new plant varieties. Also, the agency will be able to track the status of new technologies for release to private or public sectors, and will facilitate a more rapid transfer.

OTT created a new database for Technology Transfer Coordinators designed to increase efficiency of implementing cooperative research efforts. This will also increase Program Managers’ and Line Managers’ awareness of ongoing negotiations with research partners. Such information will better coordinate these activities with other projects at the national level, provide better linkage to the 22 ARS National Programs, and meet the expressed needs of customers and stakeholders.

II. Performance in the Last Fiscal Year: Activities and Outcome

Collaborative Relationships for Research & Development

CRADAs

	FY 2001	FY 2002
Active		
Total	219	225
Material Transfer – CRADA		3
Master		1
3-Way		8
New		
Total	49	59
Material Transfer – CRADA		1
Amendments¹		
Total		101
New Amendments		6

¹Amendments extend existing CRADAs for additional years to a maximum of 5 years, and/or change Statements of Work, and/or change funding levels. During FY 2002, 101 CRADAs were amended, including 54 of the 85 that could be extended in time (63%). By policy, no CRADA can exist beyond 5 years.

Other Types of Collaborative R&D Relationships

	FY 2001	FY 2002
Other Agreements	106	90
Material Transfer Agreements		436

Invention Disclosure and Patenting

Intellectual Property Management

	FY 2001	FY 2002
Inventions Disclosures	118	151
Patent Applications Filed	83	90
• Non-Provisional		68
• Provisional		22
Patents Issued	64	53

Licensing

Profile of Active Licenses

	FY 2001	FY 2002
● All licenses, number total active in the FY	255	267
▫ New, executed in the FY	32	26
▪ Invention licenses, total active in the FY	255	267
▫ New, executed in the FY	32	26
- Patent licenses, total active in FY	255	267
▫ New, executed in the FY	32	26

“Active” means legally in force at any time during the FY, whether or not the license is income bearing. All USDA licenses are patent invention licenses. There are no material transfer licenses, other invention licenses, or other IP licenses.

Income Bearing Licenses¹

	FY 2001	FY 2002
● Patent invention licenses which are income bearing, total number	241	265
▫ Number exclusive licenses	78 ²	179
▫ Number partially exclusive licenses	19 ²	37
▫ Number nonexclusive licenses	23 ²	49
● Patent invention licenses which are royalty bearing , total number	56	67

¹ FY 2001 data do not include the USDA, Forest Service.

² FY 2001 totals include only those licenses that actually *received* royalty income.

Licensing Management¹

	FY 2001 ²	FY 2002 ³
● Elapsed execution time, patent invention licenses granted in the FY (in months)		
▫ average	3.5	6.5
▫ median	3.0	6.5
▫ range	2.0 to 6.1	1.9 to 11.5
● Elapsed execution time, exclusive and partially exclusive patent invention licenses granted in the FY (in months)		
▫ average	4.1	7.7
▫ median	4.2	7.8
▫ range	2.0 to 6.1	3.7 to 11.5
● Elapsed execution time, nonexclusive patent invention licenses granted in the FY (in months)		
▫ average	2.1	5.3
▫ median	2.1	5.3
▫ range	1.9 to 3.7	1.9 to 9.0
● Number of patent invention licenses terminated for cause in the FY	1	3

¹ During FY 2002, USDA, ARS received 24 new patent license applications, for which 4 new licenses were granted. Of the remaining 20 applications, 6 applications were withdrawn by the applicants, 8 license agreements are currently in negotiation, and 5 applications are on hold by request of the applicants. The remaining application is for a material transfer license and is on hold until USDA finalizes policies and procedures for such licenses.

² FY 2001 data included only 6 records because ARS did not begin tracking this data until October 1, 2000. Records for which license applications were received prior to this date were not included. FY 2001 data do not include the USDA, Forest Service.

³ Based on 12 licenses granted. The elapsed execution time data presented does not include licenses executed with universities for co-owned inventions. In accordance with 35 USC 202 (e), such licenses are granted for the purpose of consolidating rights in the invention, and therefore a license application is not required. Records for which license applications were received prior to October 1, 2000 also were not included, because ARS did not track this data prior to FY 2001.

License Income

	FY 2001	FY 2002
● Total income received, all patent inventions licenses active in the FY	\$2,622,000	\$2,571,378
● Total Earned Royalty Income (ERI)	\$1,409,252	\$1,569,877
▫ Median ERI	\$5,723	\$5,096
▫ Minimum, Maximum ERI	\$78 to \$563,320	\$79 to \$569,265
▫ ERI from top 1% of licenses	Not presented ²	Not presented ²
▫ ERI from top 5% of licenses	\$723,167	\$794,418
▫ ERI from top 20% of licenses	\$1,109,051	\$1,254,545

¹ FY 2001 data do not include the USDA, Forest Service.

² Represents a single license.

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

	FY 2001	FY 2002
• Income distributed		
▪ Patent invention licenses, total distributed		
- To inventors	\$ 681,700	\$ 543,336
- Salaries of some technology transfer staff	\$ 1,075,000	\$ 1,102,891
- Patent filing preparation, fees, and patent annuity payments	\$ 707,900	\$ 686,696
- Other technology transfer expenses	\$ 157,300	\$ 130,317

¹ FY 2001 data do not include the USDA, Forest Service.

Downstream Outcomes from Technology Transfer Activities

Selected Examples of Tech Transfer Outcomes in FY 2002:

- NatureSeal[®] uses a special blend of vitamin salts and minerals to extend the shelf-life of sliced fruits for up to 28 days under refrigeration without detectable changes in color, flavor, or texture. Fresh-cut apple and pear slices are now being sold nationwide thanks to this technology. This is the first available commercial product of its kind that doesn't have a bad aftertaste or residue. Sliced apples coated with NatureSeal[®] are currently being served in school lunch programs. Initially developed for sliced apples and pears, the technology has been extended for sliced avocados, celery, potatoes, carrots, and onions. This technology should enhance the already booming demand for fresh-cut fruits and vegetables, and benefit both producers and consumers. ARS scientists developed the technology under a CRADA with Mantrose-Hauser Company, Inc. of Attleboro, MA, who also licensed the technology. First commercial sale occurred during FY 2000, however, sales increased during FY 2002 since the company penetrated a major foreign market and U.S. companies more readily accepted it as a product life extender.
- Gourmet Ant Bait Gel and Gourmet Ant Bait Liquid made with an ARS-developed attractant is attractive to multiple ant species. The formulation can be used in combination with water-soluble toxicants to create a bait. This attractant degrades easily and has little environmental impact. This product attracts imported fire ants, Argentine ants, Pharaoh ants, little black ants, carpenter ants, ghost ants, big-headed ants, little fire ants, acrobat ants and crazy ants. Many of these pest ants are problems both indoors and outdoors, and cause either agricultural, structural, or other damage. This technology is licensed to a small business called, Innovative Pest Control Products of Boca Raton, FL, which made their first commercial sale in FY 2002.

- Frozen breaded shrimp made with ARS-patented Fantesk™, a new, multi-use starch-based product debuted in 2002 at 62 Kroger grocery stores in Ohio and Kentucky. The product is being sold under the label Blue Harbor Inn Premium Seafood. Tiny oil droplets in Fantesk™ contain the fat-soluble compounds that enhance the food flavor. Using Fantesk™ enables manufactures to easily use fat soluble flavorings in food products. ARS scientists collaborated with Azure Waves Seafood Inc., Cincinnati, OH, under a CRADA to develop the product line using Fantesk™.
- ARS made 45 plant germ plasm releases to U.S. farmers, nurseries, breeders, and researchers to help speed transfer of those technologies to the public. These releases included a rice cultivar, several new wheat varieties, a new hop variety, raspberry, lintels, several soybean varieties, dry bean, barley, cowpea, and southern pea plant varieties; as well as several new germ plasm lines—wheat grass, broccoli, switchgrass—with enhanced or improved qualities.
- In addition, ARS scientists were honored with six Federal Laboratory Consortium awards in 2002 for outstanding technology transfer efforts and developing new products that will help consumers and farmers including:
 - A therapeutic method for people and animals afflicted with cryptosporidiosis, a parasite disease for which there is no known effective drug treatment. Three biotechnology companies have licensed the technology to develop vaccines;
 - New soybean varieties that are the first improved forage-type soybean cultivars bread for animal feed;
 - A new and improved catfish, which because it has increased feed consumption and grows faster, it should reach market weight sooner than current industry catfish. Catfish from the new line have been released to 35 commercial producers in the southeastern United States;
 - A superior strain of bacteria used to inoculate soybeans. The new strain improves nitrogen fixation, crop yields, and the amount of organic nitrogen left for succeeding crops. With the new inoculum, soybean yield increases have averaged about 2.2 bushels per acre;
 - A light-based contamination imaging system that determines product cleanliness. This system scans freshly-processed meat without making contact and detects contamination on carcasses with extremely high sensitivity;
 - EGPIC (Electronic Grain Probe Insect Counter), a high-tech insect monitoring system for bulk-stored commodities. It generates an infrared beam that senses

insects and quickly, accurately, and economically records and time-stamps when they drop through a probe trap.