



United States Department of Agriculture

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Agricultural Research Service

September 2014

# ARS Technology Transfer Process

## Working Group Report



*“Technology Transfer is the process of transferring skills, knowledge, or technologies among government or academic institutions to ensure that scientific and technological developments are accessible to a wide range of users”*

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## Glossary

ARS	Agriculture Research Service
CRADA	Cooperative Research and Development Agreement
IP	Intellectual Property
FTTA	Federal Technology Transfer Act of 1986
OIRP	ARS Office of International Research Programs
ONP	ARS Office of National Programs
ORTA	Office of Research and Technology Applications
OSQR	ARS Office of Scientific Quality Review
OTT	ARS Office of Technology Transfer
PDRAM	Program Direction and Resource Allocation Memorandum
RL	Research Leader
T2	Technology Transfer
TTC	Technology Transfer Coordinator
USDA	United States Department of Agriculture

# Summary

The Office of Technology Transfer (OTT) was created after passage of the Federal Technology Transfer Act (FTTA) in 1986 which required that each Federal laboratory establish an Office of Research and Technology Applications (ORTA). OTT was delegated authority to administer the patent and licensing program for all intramural research conducted by the United States Department of Agriculture (USDA).

Successful technology transfer (TT) of research outcomes is one of the most essential functions of the Agricultural Research Service (ARS). As the primary research arm of the USDA, ARS is dedicated to solving agricultural problems of national priority and is responsible for ensuring the relevance and impact of all its research programs. Without successful technology transfers, full potential impact of the research may not be realized.

Since the passage of the FTFA, TT at ARS is usually addressed well after a research project is underway. As a result, TT may either not be able to reach the research project's desired impact, or arrive at the scene when the technology is commercially non-viable or scientifically obsolete. In order to better help our ARS scientists reach the full potential impact of their research, we propose a different paradigm.

This proposal is a result of a series of four meetings of the ARS Technology Transfer Process Working Group (TTWG), representing all the core functions responsible for implementing the TT process at ARS (see Appendix 1). We propose that at the early stages of implementing each research project, the lead scientist and members of project team, the appropriate National Program Leader (NPL) as well as OTT convene a meeting and develop an overall TT strategy for achieving the desired impact of the research project.

While the group agreed to the steps needed to achieve the successful TT of ARS (including both intellectual property (IP) and non-IP TT), defining what constitutes the beginning of a project and importantly, when the TT process should start, has proven to be challenging. Several possibilities were explored by the Working Group, including when a Program Direction and Resource Allocation Memorandum (PDRAM) gets issued; when the lead scientist submits the concept paper for the project; when the quality and scientific merit of the project is being assessed by an external panel (OSQR); when the Technology Transfer Coordinator (TTC) reviews ARS Form 115, which may trigger a review and assessment of the project internally at OTT; or just prior to the submission of an invention disclosure. Although none of these possibilities was found to be acceptable by one or more of the Working Group members, it was agreed that for greatest success TT planning needed to start as early as possible in the ARS National Program Cycle once proof-of-concept data was available. OTT proposes that we start by reviewing the ARS form 421 that all programs already prepare for each of their research projects. Using the 421s provides OTT an immediate action item while not adding any additional burden to the scientists.

The Working Group agreed that this new paradigm will help ARS in the following ways:

- I. Every Category I and Category IV scientist, has more than one element pertaining to TT activities in

their performance plan. The agency's technology transfer program in the Area Offices as well as in OTT can help the scientists come up with a TT strategy using the impact model (see Appendix II). The earlier the TT impact model is identified, the more strategic the TT approach would be. Paramount will be the development of a tactical plan for each project to maximize the chances of achieving the impact of the TT strategy (see Appendices III, IV, V, and VI).

II. Identification of the desired impact (i.e., exclusive license, nonexclusive license, or no license) at the initiation of the research project determines which technology transfer procedure to follow. A tactical plan can be developed based on where we are in the TT process (see Appendices III, IV and V).

III. Both OTT personnel and scientists appreciate the nature of scientific research and the possibility of changing routes in the impact model provided.

This level of interaction would enable a more effective and efficient route to increasing and strengthening the impact of our research outcomes.

## ARS Technology Transfer Working Group

The ARS Technology Transfer Process Working Group was suggested by Dr. Cyril Gay, sponsored by OTT and comprised of ARS personnel representing all core functions responsible for implementing the TT process, at ARS (see Appendix 1).

**Goal:** Technology Transfer program that maximizes the impact of ARS inventions

**Objective:** Identify and recommend new mechanism(s) that have the potential of improving our agency's ability to maximize the impact of its scientific advances including inventions.

**Background:** As part of the ARS Office of Technology Transfer's (OTT) mission of enhancing research impacts, OTT's success is very dependent on interacting with scientists at critical points throughout the development and execution of research that generates inventions. OTT continually works to identify these critical points and develop plans to ensure interaction and support, however, few scientists interact and consult with OTT at critical points during the progress of their research.

**Expected Outcomes:** 1) Improved TT process, fully integrated in the ARS national program cycle; 2) Efficient TT processes that effectively support ARS scientists; and 3) Enhance the impact of ARS inventions as measured by evidence-based results.

**Methodology:** Develop more synergistic and effective systemic interactions between OTT, ONP, AFM and Line Management in the development and implementation of research programs and plans that will enable ARS scientists the greatest opportunity for high impact of research results. Development of tools, processes and training will be considered. Current opportunities, obstacles and risks will be identified and addressed.

# Technology Transfer at ARS

The Office of Technology Transfer (OTT) was created after passage of the Federal Technology Transfer Act (FTTA) in 1986 which required that each Federal laboratory establish an Office of Research and Technology Applications (ORTA). OTT was delegated authority to administer the patent and licensing program for all intramural research conducted by the United States Department of Agriculture (USDA).

OTT's activities are organized into three sections. Heretofore, primary emphasis of TT has been on the execution and management of Intellectual Property Agreements such as Cooperative Research and Development Agreements (CRADAs), Confidentially Agreement, Material Transfer Agreements and Material Transfer Research Agreements, patenting inventions and providing consultation on patenting issues and licensing patented inventions or Biological Material Licenses. However, a portion of technology from ARS research and development (R&D) can be transferred by means other than agreements.

Documentation of scientific results, objective interpretations of their significance and applicability to the public are among the major outcomes of Agricultural Research Service (ARS) research. Publications in USDA media and non-USDA media by ARS scientists are the primary form of documentation and an essential means of communicating ARS research to other scientists and to ARS customers, partners, and stakeholders.

Publications of research results in print and electronic form are insufficient to ensure that the full breadth and depth of ARS R&D is utilized and adopted. Other forms of publishing are required, including public presentations of scientific or technical information orally or in writing, in print or electronically. Other paths for technology transfer might include demonstrations at commercial venues, such as on farm trials and/or demonstrations by commercial partners. In addition, presentations at grower meetings, field days and/or popular press articles are useful to communicate and demonstrate the value of a technology. Often, stakeholders help in directing and supporting these activities of technology in the public domain.

The Presidential Memorandum "Accelerating Technology Transfer and Commercialization of Federal Research in Support of High Growth Businesses" (October 2012) directs ARS and other Federal agencies to increase their rate of technology transfer. This memorandum recognizes the need to increase the economic and societal impact from Federal R&D investments. Indeed, federal agencies are held accountable for use of TT mechanisms to increase the impact of their mission-related research.

ARS stakeholders, customers, and research partners generally recognize ARS's proven ability to manage and deploy resources (personnel, dollars, equipment) toward the R&D of solutions for serious agricultural problems of regional, national, and international significance. This recognition is reflected in the rapid expansion of ARS as a single and coherent national organization conducting research at 90+ decentralized locations across the U.S. and several other countries. ARS research focus at these locations are consistent with the site specificity of agriculture and the location of ARS's research partners, customers, and stakeholders.

The Area Offices are well positioned to communicate with stakeholders, customers, and research partners. Emerging agricultural problems can be communicated to Headquarters, resources can be

directed, the problems identified, and information and improved technology communicated to users. Technology Transfer Coordinators are a key component in each of the Area Offices.

For continued improvement, the depth and breadth of communications concerning ARS research efforts need to increase. Linkages with 1862 and 1890 land grant institutions, state agricultural extension services, stakeholders and other research partners require definitive institutionalized pathways for distributing ARS R&D results.

## Technology Transfer Considerations

### (Related to Appendices II and III)

#### 1. **Public Domain vs. License:**

- a) The goal of tech transfer is to make research outcomes publically available.
- b) Adoption of research outcomes may require non-research assets (e.g. further product development, manufacturing facilities, marketing and distribution capacity, investment capital, product registration expertise, etc.). A license provides an incentive for the private sector to invest in making those research outcomes widely available.
- c) Depending upon the research outcomes, there are at least three different tech transfer strategies: (1) public domain/no license; (2) exclusive license to a single party; or (3) non-exclusive license to multiple parties.

#### 2. **IP landscape** (i.e., freedom to operate)

- a) Do you know of any patents on technologies that would be similar to the predicted research outcomes of the project plan?
- b) Do you know of any publications on similar research that would preclude a patent on the predicted research outcomes of the project plan?

#### 3. **Partner/ Funding Need:** Four two-page documents are available on OTT website:

- a) Guiding principles for ARS-Industry partnerships.
- b) How to plan the research plan to best suit for an effective partnership?
- c) How to avoid potential conflicts/troubles when working with companies?
- d) Principles underlying the role and function of external funding.

#### 4. **Collaborative Research Relationship:**

- a) Once an outline of a research plan is developed, the Technology Transfer Coordinator (TTC) and the National Program Leader (NPL) can determine the appropriate type of agreement (CRADA, TFCA, MTRA, etc.) to formalize the research collaboration.
- b) USDA ownership of intellectual property (IP) and subsequent research impact can be negatively affected by: (1) informal collaborations that result in inventions and (2) overlapping statements of same work in several research agreements with different research partners.

## 5. Invention Disclosure:

- a) Once the research is completed and data have been collected, an invention disclosure should be entered into ARIS. Advice can be obtained from the Patent Advisor. OTT needs to give scientists feedback on invention disclosure within 48hrs due to 2013 American Invent Act.

## 6. Patent Committee:

- (a) The invention disclosure is reviewed by one of the National Patent Committees: (1) Life Sciences, (2) Chemical, and (3) Mechanical and Measurement. Patenting decisions are based on technology transfer requirements. The guidelines and structure of the patent committees can be found on the OTT website.
- (b) The patent committee discussion will result in 1 of 2 outcomes: (1) *Approval* (recommend patent application preparation and filing); *Suspension* (Not enough or insufficient data available to make a recommendation; additional research data is required to draft a strong patent application, a partner is needed to reduce the invention to practice, or the technology can be transferred by means other than a patent.).
- (c) In case there is a collaborator/co-inventor; OTT will review the disclosure promptly, and if appropriate have the collaborator take lead on patent filing and prosecution.

## 7. Scientific publication:

- a) In order to retain patent rights, publication (paper, abstract, talk, poster, etc.) cannot occur before the patent application is submitted to the USPTO.

## 8. Trade journal:

- a) The adoption of research outcomes (i.e., impact) may not necessarily occur through a scientific publication. The presentation of research outcomes through a trade journal article, newsletter, website, field days, etc. may be a more appropriate way to reach the users of research outcomes.

# Recommendations

1. Technology Transfer should begin when an ARS scientist establishes proof of concept data that show the validity of an invention and therefore intellectual property has been generated.
2. Intellectual property generated by ARS scientists is a key USDA asset and if IP protection will help the transfer of the technology, then per ARS guidelines, the IP should be protected
3. When possible a TT strategy should be identified for each project (see Appendix II)
4. The TT strategy should be identified on ARS Form 421 and a TT tactical plan should be developed to ensure the successful implementation of the strategy (see Appendices III, IV, V, and VI). If the research direction changes, then a new TT tactical plan may need to be developed.
5. A TT tactical plan should be developed by a team that may vary based on the TT strategy but in general will include the lead scientist, the project team, Research Leader, National Program Leader, TCC, OTT, and Information Staff.

6. In an effort to expedite the implementation of these recommendations, OTT recommends that we use ARS Form 421 that capture the progress of project as a starting point for TT assessment. This approach jump starts the implementation of this new paradigm without adding extra burden on our scientists.

# Appendix I

## ARS T2 Working Group

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Jose Costa, National Program Leader, ONP

Robert E. Davis, Research Leader, Beltsville Area

David Donovan, Scientist, Beltsville Area

Cyril Gay, Senior National Program Leader, ONP (Chair)

Robert Fireovid, National Program Leader, ONP

Robert Griesbach, Deputy Assistant Administrator, OTT

Marcus Kehrli, Director, National Animal Disease Center, Midwest Area

David Klurfeld, National Program Leader, ONP

Hyun Lillehoj, Senior Scientist, Beltsville Area

Thomas Moreland, Partnership Liaison, OTT

Jim Poulos, TCC, Beltsville Area

Ibrahim Shaqir, Director, OIRP

Jill Stetka, Management and Program Analysis, ONP

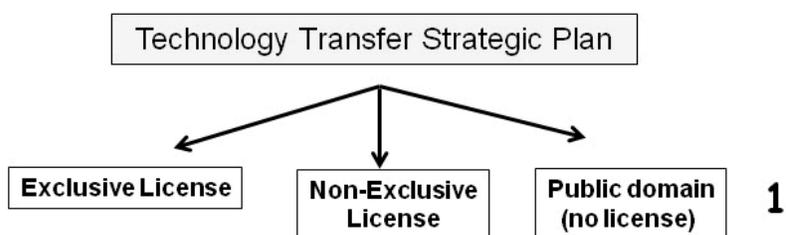
Mike Strauss, Program Coordinator, OSQR

Sandy Miller-Hays, Director, Information Staff (retired)

Tara Weaver-Missick, Acting Director, Information Staff

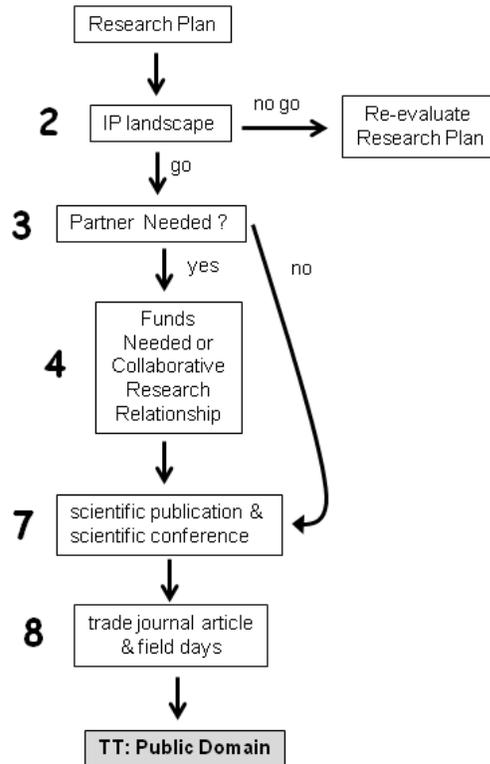
# Appendix II

## Three TT Strategies



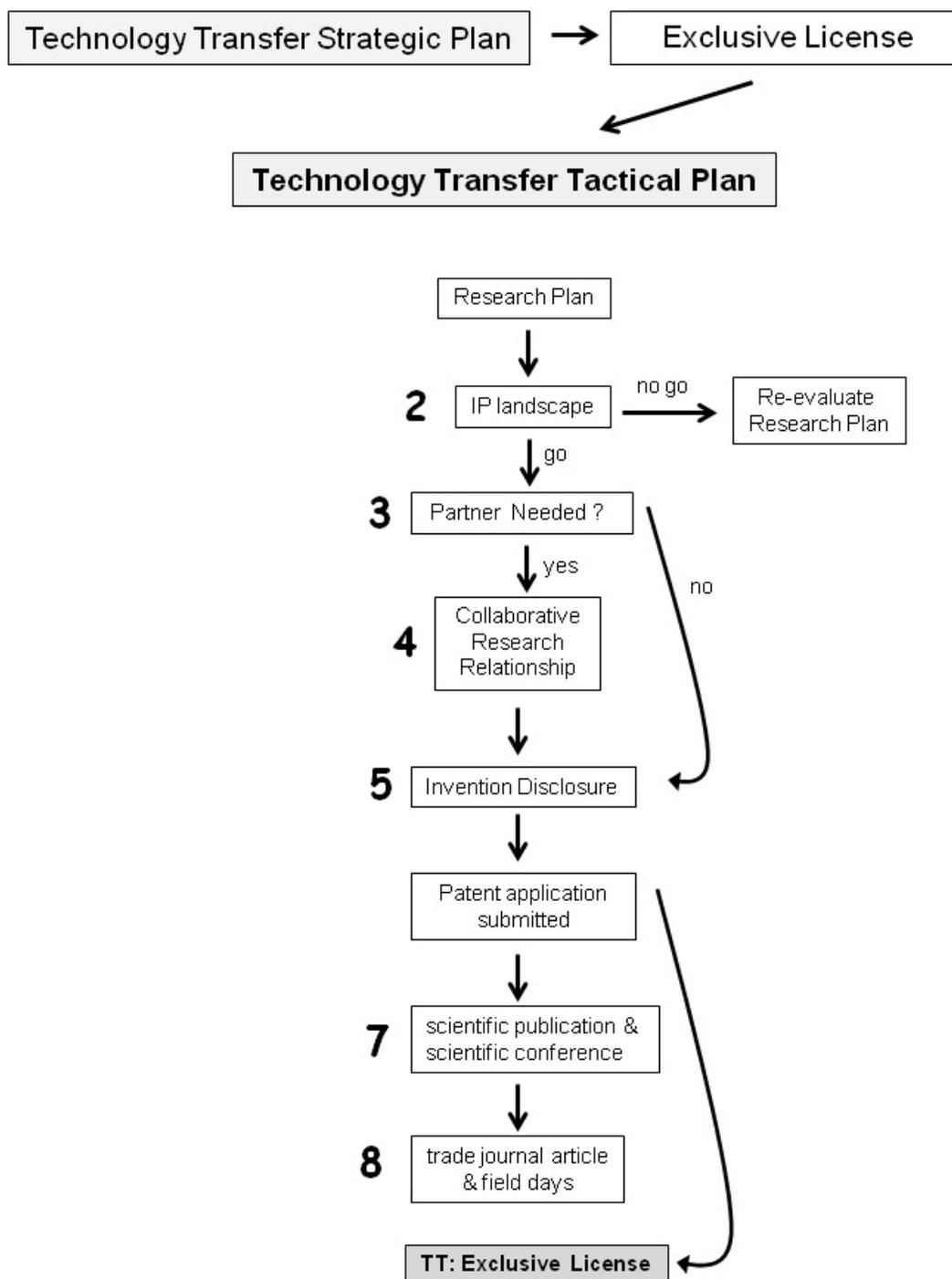
# Appendix III

## Public Domain Tactical Plan



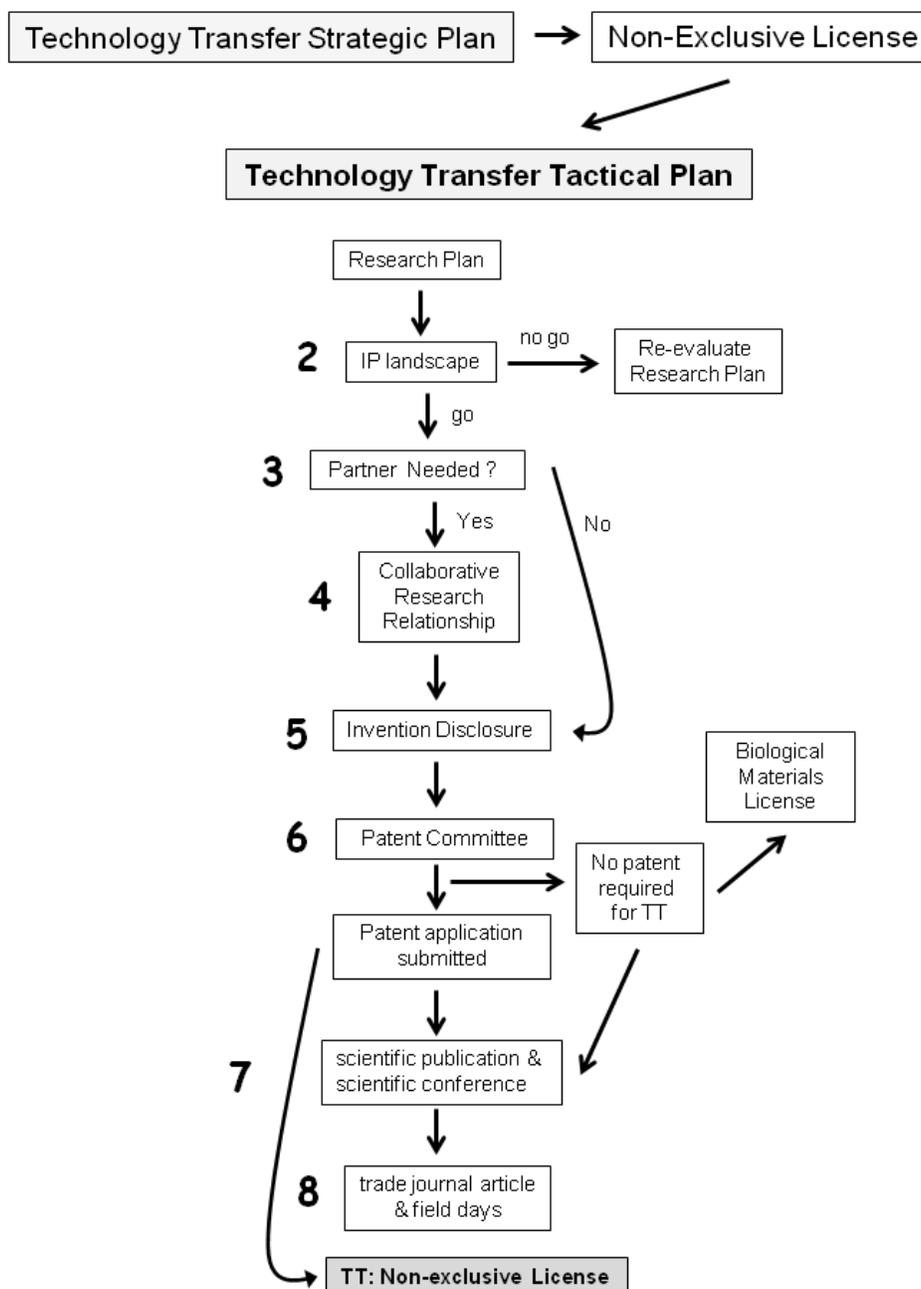
## Appendix IV

### Exclusive License Tactical Plan



# Appendix V

## Non-Exclusive License Tactical Plan



# Appendix VI

## Developing Tactical Plans

