

Twelve year LTRAS Assessment and Planning Meeting

With the harvest of the maize crop in October 2005, there will have been twelve cropping seasons at the Long Term Research on Agricultural Systems (LTRAS) project, completing six cycles of the two-year crop rotations compared. The project executive committee organized a two day meeting to review results from the project to date and to consider suggestions for strengthening its design and operation. This meeting was held on November 3 and 4, 2005 in room 2004 in the PES building. A large number of people who had or currently worked at the project and others with related interests were invited to participate. Since there are few long-term experiments, and most of them differ in significant ways, the best way to manage such experiments involves multiple considerations and is an on-going intellectual challenge of a very high order. The purposes of the meeting were to review progress over the first twelve years and to solicit ideas for its future management.

Background

The Long Tern Research on Agricultural Systems (LTRAS) project was established in 1991 on the Russell Ranch west of the Davis campus. Cropping systems comparisons began in 1993. With the harvest of corn plots in October, 2005, twelve cropping seasons were completed. Since two year rotations are used, each plot will have had six years of each phase of the rotation. The LTRAS project was planned and has been managed as a long-term research project (100 years) with the basic research objective of studying the effects of irrigation and input use, particularly N and C, on the long term productivity and possible environmental effects of farming practices. These objectives are not tied to individual farming practices. It may be the only UC project designed and managed specifically to assess slowly developing changes in some of the biophysical properties of cropping systems related to sustainability.

LTRAS is an arable cropping systems experiment focusing on annual crops: tomatoes, corn and wheat. These are grown in differing two year crop rotations. Details about the cropping systems and other aspects of project management are available at www.ltras.ucdavis.edu. An overview of the LTRAS design is in [LTRAS design](#).

In 1999, the Dean assembled a committee consisting of external and internal reviewers to assess the project and make recommendations to him about its value and future. That report can be found at the website cited above. In brief, the committee reasserted the importance of long-term research to assess sustainability and the LTRAS project in particular. They complemented the project's managers on the quality of their work, but recommended making efforts to increase use of the facility by faculty and students. Shortly afterwards, a group of faculty carrying out related work on cropping systems (SAFS) moved their research from the Agronomy and Range Science research farm to LTRAS to form a combined project and started making comparisons between reduced tillage and conventional tillage in the tomato/corn cropping systems plots, which have been divided in half for this purpose. That work has been carried out for 3 years.

At the same time, the Dean established an advisory committee to oversee the project and to plan for future uses of the Russell Ranch. This committee consists of eight faculty from diverse disciplines and is chaired by Stephen Kaffka, the current director of the project. Since not all the needs for research can be met within one project, we have developed a number of ideas for additional work at the Russell Ranch focused on other types of California agriculture, including dairy-forage systems, perennial crops, smaller scale horticultural production systems, and ecological restoration. None of these ideas have yet come into being though it is hoped that the start of the new Agricultural Sustainability Institute will be the occasion for work in these areas. These ideas are discussed in greater detail elsewhere.

Principles to guide the meeting:

There are other legitimate and successful approaches to studying sustainability, but LTRAS was deliberately designed to be a long term research project. Whether to continue with long-term research at UC Davis was a question posed and answered affirmatively by the Dean's review team a few years ago. Those participating in the assessment and planning meeting were not charged with reviewing that basic design assumption. The primary objective of this meeting is to consider how to improve the current project by assessing such issues as experimental design, rotation length and complexity, and principles related to management. Any modifications considered must build on the current project by maintaining sufficient continuity with respect to objectives, data collection and capacity to infer cause and effect. For example, there is some concern that two year rotations are too simple to adequately control certain diseases, concern that some of the treatments are not intensive enough, questions about the lowest input treatments, and a need to review the organic treatments with respect to input levels and other aspects of management.

The meeting lasted for two days ([see assessment meeting outline](#)). The first day was used to familiarize everyone with the current project, and report on project history and results to date. The second day was devoted to presenting proposals for strengthening the project for the next twelve years.

Discussion resulted in some general ideas for further discussion and development. These were:

- 1. Define how long the project should last*
- 2. Define principles for selecting improved experimental and treatment designs*
- 3. Develop experimental and treatment designs*
- 4. Establish principles for resource allocation*
- 5. Create a list of stakeholders*

These tasks were discussed in a series of meetings of the executive committee from November through March and are found in “assessment and planning meeting 1-4,” except for the stakeholders list.

Ideas are now being solicited from a wider audience about how to improve the intermediate and organic systems in the core experiment including cover crops, fertilization and other issues, what horticultural crop(s) should be included in the new rotation, and what new, non-conforming systems should be considered for addition to the project.

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