

STEEP PROGRESS REPORT

RESEARCH PROJECT TITLE: Initiating Long-term Agronomic Experiments in North-Central Oregon and South-Central Washington.

INVESTIGATORS:

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INTERIM OR FINAL REPORT: Final

PROJECT OBJECTIVES:

1. Establish a grower advisory committee that represents growers in all aspects of the proposed long-term experiments, the main objective of which is to develop sustainable cropping systems for north-central Oregon and south-central Washington.
2. Select one or two representative sites for the proposed long-term research and characterize these sites to establish base-line data from which inferences about sustainability can actually be drawn.

KEYWORDS: Long-term experiments, intensive cropping systems

STATEMENT OF PROBLEM: The wheat/fallow rotation reduces soil organic carbon, exacerbates soil erosion, and it is not biologically sustainable. Despite these concerns, adoption of alternate cropping systems, such as intensive cropping and direct seeding, has been slow due to lack of long-term research in Oregon on viability of alternate cropping systems. Occasional crop failures occurred under long-term conventional intensive cropping studies conducted at the Sherman Experiment Station in the 1940s to the 1960s. With the advent of new varieties and agronomic practices such as direct seeding, long-term research is needed to enhance benefits and reduce risks for annual cropping. To initiate these experiments, a representative site should be chosen and characterized for base-line data. To ensure social and economic sustainability of the new cropping systems, a grower advisory committee that fully participates in the implementation of experiments should be formed.

AGRONOMIC ZONE OF INTEREST: Research will be targeted for Agronomic zones 4 and 5 in north-central Oregon and south-central Washington.

ABSTRACT OF RESEARCH FINDINGS: Three meetings were held to form a grower advisory committee. The committee members are Ernie Moore (Sherman County), Tom McCoy (Sherman County), Walter Powell (Gilliam County), John Hilderbrand (Sherman County), Chris Kaseberg (Sherman County), and David Brewer (Wasco County). Because of the long-term nature of the experiment, it was decided to conduct the experiment at the Sherman Experiment Station in Moro rather than on privately owned land. A 27.2 acre-site was chosen and characterized. Soil was sampled at one-foot intervals to a depth of 5ft or to restricting layer at 126 geo-referenced locations on a 100

ft grid. The soil was archived for future chemical analyses to obtain baseline information. The site slopes from the north to nearly all directions and the slope ranges from 0.03 to 5%. Depth to restricting zone or bedrock was recorded during soil sampling. The site is shallow (0.5 – 3ft) towards the west and 4 to >5ft towards the east.

RESULTS AND INTERPRETATION

The first objective of this project was to establish a grower advisory committee that would work closely with the scientists to develop socially acceptable and agronomically sustainable cropping systems for north-central Oregon and south-central Washington. After three meetings, a grower advisory committee was formed. The committee members are Ernie Moore (Sherman County), Tom McCoy (Sherman County), Walter Powell (Gilliam County), John Hilderbrand (Sherman County), Chris Kaseberg (Sherman County), and David Brewer (Wasco County). The committee members will participate fully in all aspects of the long-term research including choosing of treatments and management of the plots.

The second objective was to select one or two representative sites for the proposed long-term research and characterize these sites to establish base-line data from which inferences about sustainability can be drawn. Because of the long-term nature of the experiment, it was decided to conduct the experiment at the Sherman Experiment Station in Moro rather than on privately owned land. A 27.2 acre-site was chosen and characterized. Soil was sampled at one-foot intervals to a depth of 5ft or to restricting layer at 126 geo-referenced locations on a 100 ft grid. The soil was archived for future chemical analyses to obtain baseline information. The site slopes from the north to nearly all directions and the slope ranges from 0.03 to 5% (Figure 1). Depth to restricting zone or bedrock was recorded during soil sampling and is shown in Figure 2.

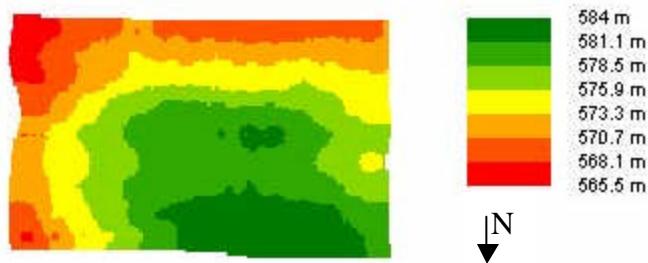


Figure 1. Elevation of the experiment site at the Sherman Experiment Station in Moro



Figure 2. Depth to restricting layer or bedrock of the experiment site at the Sherman Experiment Station in Moro

The soil probe used drilled as deep as 5 ft and we assume that the soil is more than 5ft deep in areas where the probe reached 5 ft without going through a restrictive layer. The site is shallow (0.5 – 3ft) towards the west and 4 to >5ft towards the east. The characteristics of the site make it possible to analyze the effects of aspect, slope, and depth on the proposed alternate cropping systems. Both traditional and spatial analyses will be used to interpret data.

Wheat will be planted this fall to homogenize the site and long-term experiments are expected to begin in the fall of 2003. Tentative treatments have already been chosen during meetings between scientists and the grower advisory group (Table 1).

Table 1. Long-term treatments.

Treatment No.	†Year 1	†Year 2	†Year 3	†Year 4
1A	WW-Conv	Fallow-Conv	WW-Conv	Fallow-Conv
1B	Fallow-Conv	WW-Conv	Fallow-Conv	WW-Conv
2A	WW-DS	Fallow-Chem	WW-DS	Fallow-Chem
2B	Fallow-Chem	WW-DS	Fallow-Chem	WW-DS
3	WW-DS	WW-DS	WW-DS	WW-DS
4	SW-DS	SW-DS	SW-DS	SW-DS
5A	WW-DS	SB-DS	Fallow-Chem	WW-DS
5B	SB-DS	Fallow-Chem	WW-DS	SB-DS
5C	Fallow-Chem	WW-DS	SB-DS	Fallow-Chem
6A	WW-DS	WP-DS	WW-DS	WP-DS
6B	WP-DS	WW-DS	WP-DS	WW-DS
7A	Flex-crop	Flex-crop	Flex-crop	Flex-crop
7B	Flex-crop	Flex-crop	Flex-crop	Flex-crop

INTERACTION WITH OTHER SCIENTISTS CONDUCTING RELATED ACTIVITIES:

Choosing of the grower advisory committee and site characterization did not require interaction with other scientists.

PUBLICATIONS AND PRESENTATIONS:

No publications have been prepared from this project yet.