

## *Northwest Columbia Plateau PM<sub>10</sub> Project*

**Objective #8:** *Develop Awareness and Acceptance of Best Management Practices via On-farm Testing of Improved Technologies in Farmers' Fields.*

**Title:** *High Residue Farming in Irrigated Systems for Wind Erosion Management*

**Personnel:** *Principal Investigator: Andy McGuire, WSU Extension; Technician: Sally Hubbs, WSU Extension; Cooperators: Phil Peterson, WSU Extension; Farmers: Ken Schutte, Alan Bartelheimer, Rick Nielson, Hank Lee, Travis Shew, Jame Freeman, Alan Williamson, Eric Williamson, and Mike Goodwin; Brian Lewis, Pioneer Seed Representative.*

### **Abstract of Research Findings**

Baseline data was taken and one trial was set up but there were no research findings this year.

### **Objective(s)**

1. To determine the feasibility and effect on hay quality of direct seeding alfalfa after wheat harvest
2. To determine the best way to warm soils for planting of grain corn and maintain residue cover for wind erosion management.
3. To measure baseline soil data on a high residue farming (HRF) demonstration site
4. To transfer direct seeding technology to irrigated farming regions of the Columbia Basin.

### **Methods and Materials**

**Objective 1:** Wheat was direct seeded into the minimal residue of a winter pea cover crop. However, Phil Peterson, who was going to direct the alfalfa component of this trial, resigned during the summer and the trial as originally planned was abandoned. Instead, a mustard cover crop was successfully direct seeded into the wheat stubble. As WSU does not currently have anyone working with alfalfa, this trial will not be carried out in 2011.

The cancelled wheat-alfalfa trial was replaced by a trial designed to measure the change in the soil's resistance to wind erosion after a single mustard green manure crop. This was initiated in the late summer of 2010 at the WSU Othello research unit (silt loam) and the OSU Hermiston Research and Extension Center (sand). In August, a mustard blend (*Brassica juncea* and *Sinapis alba*) used by many potato growers in the region was planted into randomized, replicated (4x) 30 x 50' plots in a paired treatment design. Plots without mustard were created by spraying the mustard seedlings in those plots with an herbicide. Fertilizer applications and irrigation were managed to maintain good growing conditions, however, air temperatures were much below normal during the growing season. At Othello, biomass was measured on Oct. 21 (ave. 5167 lbs. dry matter per acre) and incorporated by chopping and rototilling (both mustard and no-

mustard plots) on Oct. 27 at Othello. The soil's resistance to wind erosion will be determined at Othello and Hermiston with a portable wind tunnel in early spring of 2011.

**Objective 2:** The trial field received deep tillage to alleviate a plow-pan. It was then planted to a winter pea cover crop. However, most of the cover crop winterkilled and so the field had little residue when corn was direct seeded. The planned work was not possible because of the lack of residue.

**Objective 3:** In the spring of 2010, the following baseline data was taken from four locations in the demonstration field:

- Fertility: Phosphorus, Potassium, Boron, Zinc, Manganese, Copper, Iron, Calcium, Magnesium, Sodium, Total Bases, pH, E.C., Est. Sat Paste E.C., Ammonium – N, Nitrate – N, Organic Matter, and Sulfate – S. Measured by a commercial soils lab for depths 0-2", 2-6", and 6-12". P, K, pH, SOM, and Nitrate-N were also measured for 12-24" and 24-36".
- Crop residue estimates, lb/ac
- Soil penetration resistance
- Infiltration using a sprinkle infiltrometer
- Soil slake test
- Earthworm counts

**Objective 4:** A field day was held at the High Residue Farming (HRF) demonstration field on June 23, 2010. Topics included planting equipment and direct seeded wheat and corn. A High Residue Farming under Irrigation workshop was held on Dec. 1, 2010. Topics included residue management, weed management, no-till drills, and a producer panel.

### **Results and Discussion**

Because both the wheat-alfalfa trial and the soil temperature at corn planting trial were cancelled, there were no research results this year. Baseline measurements made on the demonstration field do not have any significance yet, but will be compared to future measurements to determine changes due to high residue farming. The trial measuring the effect of mustard green manures on soil's resistance to wind erosion will be completed in early 2011.

The direct seeded corn on the high residue farming demonstration field was harvested on Jan. 10th. The late harvest, which was common in the Columbia Basin this year, was due to a cool fall that delayed maturity and field drying of the grain. Yield data has not yet been received from the elevator where the grain was taken.

### **Publications and Presentations**

#### **Experiment Station Research and Extension Reports**

McGuire, A.M. High residue farming under irrigation: Strip-till. 10 p., FS030E, WSU Extension publication. (in press)

McGuire, A.M. How Columbia Basin potato producers are controlling spring wind erosion. 5 p., FS025E, WSU Extension publication. (in press)