Proposal for 2004 – 2005
Northwest Columbia Plateau Wind Erosion / Air Quality Project

Objective 8: Awareness and Understanding by Rural and Urban Populations

Title: On-Farm Testing of Cropping Systems Technology to Improve Profitability and Erosion Control in Low and Intermediate Rainfall Areas of Eastern Washington

Personnel: Principal Investigator: Aaron Esser, WSU Extension, On-Farm Testing Associate, Lincoln-Adams Area, Ritzville; Bill Schillinger, WSU dryland agronomist, Lind/Ritzville; Jon Newkirk, WSU Extension agricultural economist, Spokane; Dennis Tonks, WSU Extension, dryland farming specialist, Davenport; Diana Roberts, WSU Extension, agronomist, Spokane; Lincoln Conservation District Supervisors - Dave Lundgren, Manager; Adams Conservation District Supervisors - Gary DeVore, Manager; Frank Young, USDA-ARS weed scientist, Pullman; James Cook, USDA-ARS plant pathologist, Pullman; Joe Yenish, WSU weed specialist, Pullman; Ann Kennedy, USDA-ARS soil microbiologist, Pullman; Robert Papendick, Columbia Plateau Wind Erosion Project BMP Coordinator, Pullman; Don Wysocki, OSU Extension soil scientist, Pendleton.

Objective
Continue to utilize and expand 1) the use of on-farm testing to accelerate the development and grower adaptation of minimum tillage and no-till systems, and 2) more intensive crop rotations that improve profitability, erosion control and soil productivity in low and intermediate rainfall areas of Adams and Lincoln Counties in eastern Washington.

Recent Accomplishments
On-Farm Testing: Sixteen on-farm tests were initiated, completed or initiated and completed this past year throughout the Adams-Lincoln County area of eastern Washington. These tests examined minimum tillage and no-till systems, and more diverse crop rotations that improve profitability, erosion control and soil productivity. More specifically, a series of on-farm tests at two locations examined recrop winter wheat feasibility following 4 previous crops and chemical-based summer fallow. In this test, winter wheat following spring wheat produced at least $40/acre more revenue above variable costs than winter wheat following any of the other 3 crop treatments and chemical-based summer fallow. One series of on-farm trials initiated in 2002 is examining the value of yellow mustard in an intensive direct seeded cereal grain rotation. This past year, ground previously cropped with yellow mustard had significantly less weeds at the time of seeding than ground previously cropped with spring barley. However, no yield differences were detected in spring barley following spring barley or yellow mustard, and in the combined 2 years, no difference in gross economic returns were detected between spring barley following spring barley or yellow mustard. One trial initiated in 2003 is designed to examine the advantages and differences of minimum tillage and chemical based summer fallow systems in a
three year cropping rotation. This trial is closely examining economics, changes in soil quality, moisture, and weed control issues. It is designed to help farmers utilizing direct seeding to further reduce their risk especially in regards to drought. It is also designed to help farmers in a conventional production system better understand and incorporated direct seeding into their operation. Other on-farm tests focused on many different aspects such as seeding rates of direct seeded wheat, malt barley variety trial, direct seeded spring wheat nitrogen fertility rate study, fall fertilization for direct seeded spring wheat, and herbicide feasibility in chemical based summer fallow.

**Associated Educational Materials and Programs:** A number of field days, plot tours and other educational efforts were conducted through the summer to accelerate the development and grower adaptation of minimum and direct seed systems, and more intensive crop rotations. Esser organized and spoke at the Northern Lincoln County Research Tour in Wilbur on July 8, 2003 at which over 45 growers/researchers attended. Esser also helped organize and spoke at the annual Wilke field day in 2003, and he spoke at the Lind Field day with over 200 growers/researchers attended these events. Esser also participated in the Soil and Water Conservation Society 2003 Annual Conference as a speaker, and an on-farm test northwest of Wilbur, WA was included as a “Tour” stop.

A number of workshops, grower meetings and other educational efforts were conducted throughout the year to accelerate the development and grower adaptation of minimum and no-till systems, and more intensive crop rotations. Esser lead the organization of the annual research update meeting in Ritzville (70 attended) on February 5, 2003 entitled “Research in the Dryland Cropping Area and Annual Adams Conservation District Meeting”. The program informed growers about current annual cropping, no-till, and alternative crop research in the dryland area. Esser also actively participated in other workshops and grower meetings throughout the multi-county dryland region of northeast/north central Washington. Overall, he made presentations at 5 different meetings attended by over 150 growers.

In addition to field days, plot tours and workshops, publications can provide an important source of grower information on regional research results and experiences. Esser published a technical report highlighting on-farm test results entitled “On-Farm Test Results, Lincoln-Adams Area 2002.” Four articles summarizing different aspects of on-farm test results were printed in the Ag Horizons Newsletter and an abstract was prepared for the WSU Department of Crop and Soil Sciences 2003 Field Day Abstracts: Highlights of Research Progress.

**Planned Research and Extension Education - 2003-2004**

Future research and extension educational programs will continue to focus on using on-farm testing to accelerate the development and growers adaptation of minimum and no-till systems, and more intensive crop rotations that improve profitability, erosion control and soil productivity in low and intermediate rainfall areas of Adams and Lincoln Counties in eastern Washington. Adjoining counties of Douglas, Franklin, Whitman and Spokane should also benefit from the on-farm testing and educational programs and information. Other associated educational programs and materials that are planned include workshops, field days and tours, publications and responding to grower requests for technical support.
Continuing and Future On-Farm Tests plans: The third and final year of on-farm tests examining the value of fall fertilization in spring cropping systems have been established this fall. On-farm testing will continue to examine; the value of incorporating yellow mustard in an intense direct seed cereal grain rotation, feasibility of chemical fallow in comparison to tillage-based fallow, and feasibility of winter wheat fertilization with a spoke wheel applicator with a goal of reducing summer fallow tillage. Additional on-farm test will focus on chemical fallow systems including variety selection, and other issues related to grower adaptation of minimum and no-till system, and more intensive crop rotations.

Associated Educational Materials and Programs: Esser has plans to continue to organize and participate in grower meetings and field tours that accelerate the development and growers adaptation of minimum and no-till system, and more intensive crop rotations that improve profitability, erosion control and soil productivity in low and intermediate rainfall areas of Adams and Lincoln Counties in eastern Washington. Esser also has plans to continue the “On-Farm Test Results, Lincoln-Adams Area” publication in subsequent years and also make them available on the Internet. He also plans use his HRSW on-farm test results in combination with other work being done to develop a comprehensive HRSW production guide. He will also continue to develop a series of articles for grower organization publications and agricultural media in the region.