Appendix A

Abbreviated Objectives of the Northwest Columbia Plateau Wind Erosion/Air Quality Project

1) Develop low and moderate resolution base data for the Columbia Plateau in GIS format necessary to describe major input variables such as climate, soil, vegetation and farming practices required to estimate agricultural wind erosion and PM_{10} particulate emissions.

2) Establish the theory, quantification, and verification of simultaneous wind erosion and PM_{10} fluxes on agricultural lands in the Columbia Plateau with data from several intensively instrumented agricultural field sites and a portable wind tunnel for calibration of the USDA National Wind Erosion Prediction System.

3) Obtain, test and evaluate air mass transport-dispersion-deposition models suitable to predict PM_{10} concentrations over the Columbia Plateau from spatially-distributed agricultural emission sources.

4) Develop a PM_{10} air quality inventory for wind erosion events in the Columbia Plateau region and the probable urban impacts utilizing results and methods of objectives 1, 2, and 3.

5) Identify and test wind erosion and PM_{10} emission control methods of alternative cropping systems (tillage, crops, rotation, weed control, etc.), and evaluate their effectiveness through descriptive measurements and portable wind tunnel tests.

6) Use data developed in objectives 1, 2, and 3 to appropriately reclassify suspect areas as Highly Erodible Lands (HEL) for control through the Food Security Act (FSA) assistance and develop strategy with USDA-SCS to set FSA criteria for on-farm compliance and assistance.

7) Determine the relative impact of human activity on suspended dust and PM_{10} emission rates in the Columbia Plateau by determining erosion rates for non-anthropogenic and anthropogenic areas on a regional basis plus estimating pre-human erosion rates for soils during high wind events.

8) Develop awareness and increased understanding by both rural and urban populations in the Columbia Plateau through educational materials, programs and news media about wind erosion. PM_{10} particulate emissions and current and prospective control methods.

9) Better understand health impacts of particulate air pollution from several sources including agriculture.

10) Develop agricultural windblown dust best management practices and implementation policies including evaluating the profitability and social benefits of alternative farming systems for air quality control.

11) Develop a Columbia Plateau particulate air quality plan and modify local plans to achieve solutions to PM_{10} problems throughout the Columbia Plateau.

Appendix B
Supplemental Photographs

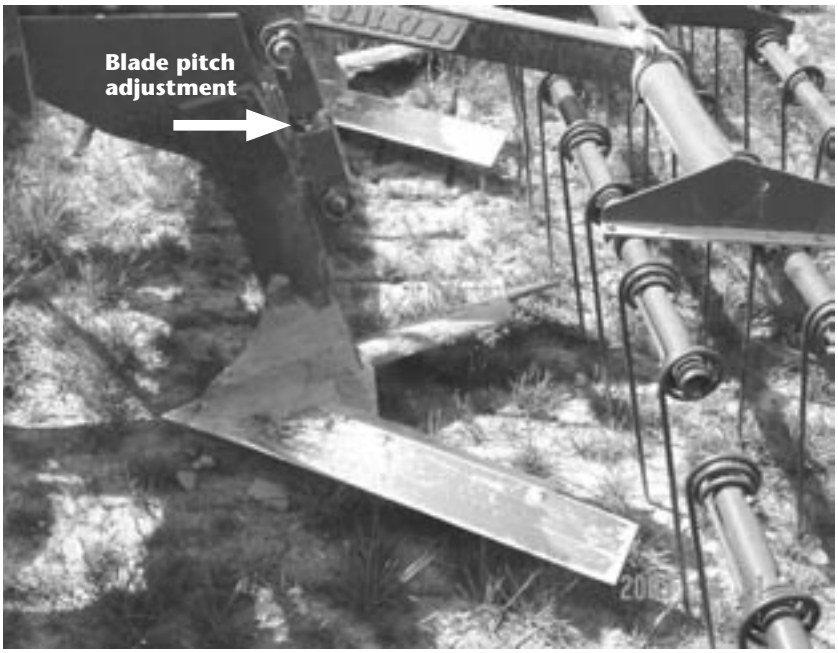

FIGURE 1B. *Haybuster™ undercutter V-sweep blade with attached 3-bar spring-tooth harrow. Each undercutter blade is 32-inches wide with 28-inch spacing between blades (on two tiers) to slice below the soil surface with minimum soil lifting. As a primary spring tillage implement, the undercutter completely severs capillary pores to halt liquid water movement towards the soil surface as required to retain seed-zone moisture in summer fallow. The pitch of each blade can be individually adjusted to ensure uniform horizontal movement (i.e., minimum soil lifting) underneath the soil. This implement can easily be fitted to deliver aqua nitrogen at the time of primary spring tillage. Depending on soil texture, farmers may or may not want to attach a finishing implement behind the undercutter to break large soil clods and fill air voids. The attached 3-bar spring-tooth harrow shown here is ideal for primary spring tillage of soils at the WSU Dryland Research Station at Lind. In addition, the undercutter works well for killing Russian thistles, if needed, after wheat harvest. Long-term research has shown that conservation tillage using undercutter V-sweeps represents a "win-win" solution for farmers and for the environment in winter wheat–summer fallow production areas. Photograph by W.F. Schillinger, WSU.*

FIGURE 2B. *The Cross-Slot no-till drill opener has wing openers flanking either side of the disk coulter that are uniquely designed to place seed and fertilizer at an adjustable depth with minimal disturbance of soil and surface residues. The seed row and fertilizer bands on opposite sides of the coulter are separated horizontally by about one to one and one-half inches and either equal vertical depths or fertilizer up to 2 inches deeper. The angled rubber packer wheels close the disk slot with minimal soil or residue disturbance. This ultra low-disturbance design is especially desirable in low residue conditions often typical of dryland farming, or after low residue crops; however the openers operate equally well in winter wheat residues following an 80 or more bu per acre crop. Photograph by K.E. Saxton, USDA-ARS, Pullman, WA (retired).*

FIGURE 3B. *Providence & Marcellus Roads: Dust blowing off a field created a hazard for motorists traveling along Providence Road in Adams County on October 28, 2003. The field from which the dust was blowing was in reduced tillage and recently planted to winter wheat. Photograph by B.S. Sharratt, USDA-ARS, Pullman, WA.*

FIGURE 4B. *Wheat rows: Dust storms can affect all aspects of life on the Columbia Plateau. Winter wheat plants recently emerged on a field in Adams County were shredded and buried by blowing sand and dust on October 28, 2003. This field had to be replanted at a great cost to the farmer. Photograph by B.S. Sharratt, USDA-ARS, Pullman, WA.*

Appendix C
Tribute to Roger Veseth

Roger Veseth, extension agronomist and soil scientist, died on September 9, 2003 in Moscow, Idaho as the result of a severe accident last March that incapacitated him from the neck down. He is survived by his wife Claire and their four children at Moscow, Idaho. Roger was one of our very active and supportive team members in the conservation research and extension programs of the region and will be sorely missed.

Roger served as Extension Specialist for Conservation Tillage in a dual appointment with the University of Idaho and Washington State University since 1987 with emphasis to disseminate results from the STEEP research program. In addition, Roger readily assumed the extension leadership for the Columbia Plateau PM10 Project (CP_3) research program in 1992. His extension activities accelerated the development, transfer and awareness of new farming and conservation practices for the reduction of both water erosion and, more recently, wind erosion and dust emissions.

Roger worked closely and in unison with a wide range of producers, scientists, extension agents, conservationists, and agriculture service industry representatives to integrate new technologies from research and grower innovations for improved management strategies to protect soil and water resources and maintain farm profitability. He made information readily available through well-organized conferences, workshops, field days, tours, and on-farm testing programs. He was a particularly talented and prolific writer which produced extensive documentation by publications and computer access, award-winning brochures and information packages. These many contributions advanced conservation science and practice on farmlands throughout the Pacific Northwest, US and Worldwide to provide a legacy of conservation knowledge and foundation that will serve as guidance for many years.