# Farming with the Wind II

## Wind Erosion and Air Quality Control on the Columbia Plateau and Columbia Basin

College of Agricultural, Human, and Natural Resource Sciences Special Report XB1042
by the Columbia Plateau $PM_{10}$ Project
Washington State University
February 2004

by

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University Publishing
Washington State University, Pullman

**ON THE COVER:** *Grower Ron Jirava observes wheat harvest of direct-seed trials on his farm near Ritzvillle, WA. In the background is a dust cloud from wind erosion on an intensively tilled fallow field. The goal of the $CP_3$ is to control wind erosion on agricultural lands with soil conservation techniques under study on the Jirava farm and elsewhere in the Columbia Plateau and Basin.*

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Washington State University
USDA-Agricultural Research Service
USDA-Cooperative States Research, Education and Extension Service
US Environmental Protection Agency
Washington State Department of Ecology
University of Idaho
Oregon State University
USDA-Natural Resources Conservation Service
Benton Clean Air Authority
Spokane County Air Pollution Control Authority
Washington Association of Wheat Growers
Oregon Wheat Growers League
Adams County Conservation District

## *Support*

Funding for this publication was provided by Washington State University, the USDA-Agricultural Research Service, and the USDA-Cooperative States Research, Education and Extension Service. The contents and views expressed in this publication are those of the author and reviewers and do not necessarily reflect the policies and positions of the supporting and collaborating institutions and agencies.

## *Special thanks and acknowledgments*

Special thanks and appreciation are extended to W.F. Schillinger and B.S. Sharratt for their comprehensive reviews of the publication in its entirety and to scientists who reviewed selected chapters. The author also thanks C. Warriner, R. Rupp, and R. Bolton of the Department of Crop and Soil Sciences, Washington State University for their professional assistance with the graphics and photographs used in the work.

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# Contents

# Preface

This book is a follow-up to *Farming with the Wind* published in 1998 by the Columbia Plateau $PM_{10}$ Project ($CP_3$) on best management practices for controlling wind erosion and air quality on the Columbia Plateau. The need for *Farming with the Wind II* became apparent when reviewing research progress by University and USDA scientists and engineers in their efforts to develop new and improved methods, technologies and strategies for predicting and controlling wind-induced soil erosion and dust emissions from the region's farmlands since the earlier publication six years ago. Consequently, compiling and summarizing this new information for our user clientele involved with soil conservation and air quality issues was considered to be an urgent priority. So far, agriculture on the Columbia Plateau and Columbia Basin has not been implicated as contributing to nonattainment of EPA air quality standards due to increases of particulate matter in the atmosphere, both locally and downwind. This is attributed primarily to increased adoption of improved farming practices and new technologies based on $CP_3$ research and development along with input and innovations by growers themselves.

This book emphasizes throughout that maintaining year round vegetative cover as crop canopy or residue, and surface roughness is key to controlling wind erosion and dust pollution in downwind areas. Soils of the Columbia Plateau and Columbia Basin are highly susceptible to blowing because of the dry environments, limited vegetation, high winds, intensive tillage, and because they contain substantial quantities of readily erodible and suspendible fine particulates. Much of the potential for erosion is on cultivated dry and irrigated farmlands that the region depends on for the production of a variety of cereal, horticultural, vegetable and hay crops.

The goal of the $CP_3$ from its inception and yet today is to develop conservation practices that will enable growers to control wind erosion and dust emissions without suffering economic hardship, and to assist them with adopting these practices on their farms. Progress of the $CP_3$ toward this end has been highly successful, and indeed, exemplary. This can be attributed to the acumen and organized efforts of Project managers, scientists and educators from regional institutions and agencies working in collaboration with growers, grower organizations and the farming community. Without their combined contributions to an outstanding list of accomplishments, this publication would not have been possible.

It is far more economical and less frustrating for growers and society alike to prevent designation of an area as nonattainment for particulate pollution than to correct the problem and return to attainment status. Though much has been learned about the principles and control of wind erosion and dust emissions on the Columbia Plateau and Columbia Basin in the past decade, the work needs to be strengthened and continued with special emphasis on the development and implementation of control technologies at the farm level. This will help to ensure compliance with EPA ambient air quality standards by agriculture in the region. The $CP_3$ has the organization and experience to accomplish this task both effectively, and in the best interest of the public that it serves.

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A wind farm with 25 1.5 MW turbines costs upward of $100,000,000. Although the leaders of Greenpeace, the Sierra Club, or the ridiculously misnamed Union of Concerned Scientists are evermore touting â€œgreen, renewable energy,â€ a listing of the major players doesnâ€™t provide any evidence that these groups are putting their money up for wind-farm construction. While our environmentalist neighbors pay lip service to â€œclean energyâ€ and â€œfree fuel,â€ they are seldom if ever involved in wind-farm projects.Â  The Driving Force There are many wind-power worshippers, but we havenâ€™t located the individuals or groups with the deep pockets and clout to set in motion all of the wind-turbine construction that weâ€™ve seen disfiguring the U.S. landscape. Aikengal II wind farm development. Powersystems designed, supplied, installed, tested and commissioned a 132kV outdoor open-terminal substation for a new 60.8MW wind farm including; A 90 MVA 132/33kV grid transformer and associated 132kV circuit breaker, disconnectors, VTs, protection panels and substation SCADA system. Also inclusive of a 6-panel 33kV indoor switchboard, and the associated wind farm 33kV cabling to 19 wind turbines.Â  Aikengall II Community Wind Farm was given planning consent by the Scottish Government on Friday 1 March 2013. The wind farm has an installed capacity of 60.8 MW to generate clean, green electricity. Aikengall II Community Wind Farm became operational in November 2017. What the client wanted The wind farm has about 627 wind turbines with the capacity to produce a combined total of 781.5 MW clean energy. The construction of the Roscoe Wind Farm took place in four phases. The first phase in 2008 and consisted of 209 1 MW Mitsubishi turbines. The 2 nd phase was also completed in the same year and included 55 2.3 MW Siemens machines.Â  It is partly owned and run Ã˜rsted, with the Danish pension funds PKA and PFA collectively owning 50%. The project launched in September 2018. It has 40 MHI Vestas 8MW wind turbines and 47 Siemens Gamesa 7MW wind turbines with a total capacity of 659MW, enough to power 600,000 homes in the UK. The electricity is transmitted using two 4,000t offshore substations. Advertisement. Follow Us on. A wind farm or wind park, also called a wind power station or wind power plant, is a group of wind turbines in the same location used to produce electricity. Wind farms vary in size from a small number of turbines to several hundred wind turbines covering an extensive area. Wind farms can be either onshore or offshore. Many of the largest operational onshore wind farms are located in China, India, and the United States. For example, the largest wind farm in the world, Gansu Wind Farm in China had a... An onshore wind farm proposal located near to Huntly, Aberdeenshire. The proposal consists of 14 turbines, each with up to a 6MW capacity and with a tip height of 180m.Â  Proposals for Clashindarroch II are to enter the planning process in January 2020. The 77MW scheme would consist of 14 new turbines, each with around a 6 megawatt (MW) capacity. The turbines are expected to produce enough fossil-free electricity to meet the equivalent demand of more than 55,000 UK households, and annually prevent more than 70,000 tonnes of carbon dioxide from entering the atmosphere. Clashindarroch Wind Farm, Aberdeenshire. Reaching net zero.