Soil and Water Challenges for Pacific Northwest Agriculture

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The focus of this chapter is the Pacific Northwest (PNW) of the United States. We highlight Columbia Basin and Columbia Plateau farmlands in eastern Washington, north-central Oregon, and northern Idaho, also referred to as the Inland PNW (Fig. 2–1). Both dryland and irrigated agriculture are practiced. Dryland farming began first in the higher precipitation region known as the Palouse in southeastern Washington and bordering Idaho in the 1860s by pioneers from Midwest states who sought free and clear title to farmland through the Homestead Act of 1862 (Meinig, 1968). By 1880 settlements were expanding into the low precipitation zones, and by 1907 all available farmland was claimed. Irrigated farming was practiced on a small scale from the earliest days by diverting water from perennial waterways and creeks. In 1905 the Yakima Basin Irrigation Project (Fig. 2–1) was initiated with the building of a series of dams on the Yakima River to divert water for irrigation. Beginning in 1951 large tracts of native desert land in east-central Washington came under crop production from water pumped from behind the Grand Coulee Dam by the federal Columbia Basin Project. Other irrigated farmland was established with water diverted from the Columbia River and its tributaries along the Oregon-Washington border and from deep wells dug mostly in the 1960s. Today, dryland agriculture is practiced on 3,348,000 ha and irrigated agriculture on 646,000 ha in the Inland PNW (Table 2–1).

Wind erosion is a major agricultural concern in the low-precipitation (<300 mm annual) rainfed area (Fig. 2–2) and in the irrigated Columbia Basin and Yakima Basin (Fig. 2–3), where limited crop residue, excessive tillage, drought, poorly aggregated soils with low organic matter content, and high winds combine to cause dust storms that transport suspended soil particulates long distances (Papendick, 2004). Nitrate leaching from irrigated agriculture into domestic groundwater supplies is also a problem. Soils are primarily silts and fine sands...