

---

## Contents

<i>Preface</i>	vii
<i>Acknowledgments</i>	xi
<i>Introduction</i>	1
1. Horticultural Beginnings	7
2. Trees for the High Plains	19
3. Horticulture for Home and Community	33
4. Toward “A New Phase of Civilization”	51
5. Science and Its Application to Horticulture	63
6. Creating Home on the Range	85
7. Limits of Dry-Land Horticulture	107
8. Forging New Paths in Ornamental Horticulture	129
9. Collecting and Creating Hardy Plants	151
10. Federal Engagement in Horticulture	171
11. The Cheyenne Horticultural Field Station	195
12. Horticulture and Community	227
<i>Postscript</i>	243
<i>Bibliography</i>	249
<i>Index</i>	261



## Horticultural Beginnings

Vegetable gardens and ornamental flowers provide the setting for some of the most poignant episodes in Willa Cather's *O Pioneers!* Although fictional, they may well be the most widely read depiction of early settler life on the High Plains. Take, for example, John Bergson addressing his children from his deathbed: "[D]on't grudge your mother a little time for plowing her garden and setting out fruit trees, even if it comes in a busy season. She has been a good mother to you, and she has always missed the old country." Her garden helped Mrs. Bergson reconstruct her former life insofar as possible.

Then, on a September afternoon two years later, Alexandra, the eldest of the Bergson children and by then fourteen, is found by her boyfriend, Carl Linstrum, in her mother's garden, resting from digging sweet potatoes: "[T]he dry garden patch smelled of drying vines and was strewn with yellow seed-cucumbers and pumpkins and citrons. At one end, next to the rhubarb, grew feathery asparagus, with red berries. Down the middle of the garden was a row

of gooseberry and currant bushes. A few tough zinnias and marigolds and a row of scarlet sage bore witness to the buckets of water that Mrs. Bergson had carried there after sundown, against the prohibition of her sons.”<sup>1</sup>

Willa Cather’s contemporary, Charles S. Harrison, a Congregational minister and amateur horticulturist who once lived just a few miles west of the novelist’s hometown of Red Cloud, observed: “Many a poor woman on the frontier has slowly faded away with soul starvation. She had potatoes enough, but she needed flowers.”<sup>2</sup> Even under the most primitive conditions of early settlement, vegetables fed the body and flowers fed the soul.

On the High Plains, the actual origins of horticulture, in the broadest sense of cultivation of the soil, remain obscure. Some archaeological evidence suggests that prehistoric Plains Indians cultivated the sunflower (*Helianthus annus* L.), but no such evidence is specifically known for the High Plains. Spanish explorers, roaming through the region from Central America, apparently introduced maize, beans, and pumpkin. Early-nineteenth-century explorers, traders, and trappers occasionally found those plants cultivated around Indian habitations.<sup>3</sup>

The Plains Indians, as we know, were primarily hunters, but they did gather, cook, dry, and process a wide variety of native plants. Among the most common was the prairie turnip (*Psoralea esculenta* Pursh). As late as 1905, Niels Hansen observed Indians in southwestern South Dakota using these plants: “[T]he Indians dig them out from the prairie sod with a pointed stick and braid them into long chains. When ready to use them, the outer dark brown or blackish coating is removed, leaving the snow white starchy bulb.”<sup>4</sup>

Actually, the prairie turnip is not a turnip at all but a legume variously known as scurvy pea, breadroot, Indian breadroot, Indian turnip, prairie potato, pomme blanche, ground apple, white apple, Tipsin, Tipsinna, and Dakota turnip—all of which suggests the wisdom of using the scientific names of plants as well as their horticultural or common names.<sup>5</sup> The scientific names follow *International Rules of Botanical Nomenclature* and thus are universally recognized, but the common names are governed by no formal code and vary from region to region.

At the outset of our story, therefore, and to avoid future confusion, we must understand the rudiments of plant nomenclature. Because Latin was the first, universal language of the sciences, eighteenth-century botanists adapted, and in some cases invented, Latinate words to identify plants, their relationships to each other, and the authors who first described them. Hierarchically from the most general to the most specific, botanists classify plants at six levels: division or phylum, class, order, family, genus, and species. We need



Prairie turnip, Rocky Mountain Herbarium, University of Wyoming, Laramie. Courtesy, Ronald K. Hansen.

concern ourselves only with the last three levels. The family name of a plant is generally recognized by the ending *aceae*; for example, the western sand cherry belongs to the rose family known as *Rosaceae*. Within that family, the western sand cherry belongs to the genus *Prunus*, the genus name always given as a Latin noun. Within that genus, the species name is written as a Latin adjective, in this case, *besseyi*.

It turns out that Liberty Hyde Bailey, dean of American horticulturists and longtime professor at Cornell University, first described the western sand cherry as a separate species in 1898. He named it *Prunus besseyi* in honor of his friend and colleague Charles Bessey of Nebraska. Thus the full scientific name of the western sand cherry became *Prunus besseyi* L.H. Bailey.

To somewhat complicate the matter of nomenclature, especially for those of us with little or no background in the sciences, the systematic classification of plants is fluid rather than static, changing as a result of new research and other factors. To continue our example, Henry Allan Gleason (Gl.) of the New York Botanical Garden reclassified the western sand cherry in 1952, from a separate species to a variety or subspecies of the sand cherry (*Prunus pumila* L.)—the latter first described by Carl Linnaeus (L.), the founder of modern taxonomy. As a result, the western sand cherry is now known and written as *Prunus pumila* L. var. *besseyi* (Bailey) Gl.<sup>6</sup>

In addition to the plants created in nature, a great number of varieties have been developed through plant propagation and plant breeding. Known as cultivars, the names of these varieties are generally given in English and written in single quotes, such as *Fragaria vesca* L. cv. ‘Ogallala’ for the strawberry cultivar developed at the Cheyenne Field Station from the crossing of a hardy native plant with a large commercial variety.

Because the early traders were essentially hunters, the numerous edible plants native to the High Plains undoubtedly played an insignificant role in relieving starvation. With the establishment of trading outposts on the High Plains in the 1820s and 1830s, efforts certainly were made, albeit isolated, to grow vegetables—for example, at Bent’s Fort on the Arkansas River, Lupton’s Fort on the South Platte, and Fort William (later renamed Fort Laramie) on the North Platte. If the recollections of Benjamin Louis Eulalie de Bonneville (1832) are any indication, horticulture at Fort William generally did only marginally well: “All attempts at agriculture and gardening in the neighborhood . . . have been attended with very little success. The grain and vegetables raised there have been scanty in quantity and poor in quality.” Given the aridity and the elevation (4,300 feet), the region was slated to remain forever in “a state of pristine wilderness.”<sup>7</sup>

That view was confirmed by Edwin Bryant, a Kentucky journalist who stopped at Fort William fourteen years later, in June 1846, on his way to California. “Not a foot of ground around the fort is under cultivation,” he reported. “Experiments have been made with corn, wheat and potatoes, but they either have resulted in entire failures, or were not so successful as to authorize a renewal.” In addition to the adverse climatic conditions, Bryant



*Soldiers protecting vegetable garden, Fort Laramie, ca. 1880. Courtesy, Fort Laramie National Historic Site.*

suggested another reason for crop failures: “The Indians, who claim the soil as their property, and regard the Fur Company as occupants by sufferance, are adverse to all agricultural experiments; and on one or two occasions they entered the small enclosures, and destroyed the young corn and other vegetables as soon as they made their appearance above the ground.”<sup>8</sup> After the U.S. government purchased the fort in 1849, the military at certain times of the year posted guards around the clock to protect its gardens.

Indeed, since 1818 the War Department had specified that soldiers at every military post “will annually cultivate a garden . . . equal to supplying hospital and garrisons with the necessary kitchen vegetables throughout the year” and that the commanding officer “will be held accountable for any deficiency in the cultivation.”<sup>9</sup> That was a tough order for any post on the High Plains, although surprisingly well accomplished at Fort Laramie beginning with the 1850 growing season, flourishing after the Civil War, and continuing until the fort’s abandonment in 1890.

The War Department’s order of September 11, 1818, had been given for reasons of both health and finance. By then, it was well understood that vegetables and fruits were essential to good health, most specifically for preventing the debilitating effects of scurvy, which we now know are a result

of diets deficient in Vitamin C. In addition, the War Department sought to limit transportation expenses by having soldiers, so far as possible, grow their own produce. The high cost of transporting bulk goods, before the advent of the railroad, would serve both as obstacle to importing plant materials and as incentive for local horticulture.

Fort Laramie was among the outposts most distant from supply depots, strategically situated 600 miles west-northwest of Fort Leavenworth (the beginning of the Oregon Trail), at the confluence of the Laramie and North Platte rivers on the High Plains of eastern Wyoming. In the early spring of 1850, Fort Laramie's supply officer recorded that he had gotten ten acres "sod-busted," that he had secured plows to cultivate the land, and that he would "put in as much seed, corn, oats and barley, as my means will allow." He had also secured the services of a settler, recently arrived from the Arkansas River valley and knowledgeable about irrigation. That arrangement did not last long, as the settler joined a convoy en route to the gold mines of California. This led the officer to send an agent to Taos to recruit ten to twelve Mexicans, knowing they would be familiar with irrigated farming, which the supply officer believed was the only way to successfully cultivate around Fort Laramie. The officer also noted that Mexicans worked more cheaply than Americans.<sup>10</sup>

The earliest irrigation at Fort Laramie consisted of a single earthen ditch, no more than a few hundred yards in length, taking water out of the Laramie River for gardens on nearby bottomland. Nothing indicates that seeds were purchased from nearby Indians or settlers or that the soldiers had collected seeds of native edible plants. Instead, the post supply officer requisitioned seeds from Fort Leavenworth. In late summer of 1856, he reported that, while his potato plants looked well, the fact that his seed potatoes had arrived in poor condition meant the harvest "will be very small, if it does not fail entirely." As a result, he requested his counterpart at Fort Leavenworth to take great care not only in selecting the best plants but also in carefully packing them in hay to protect against freezing while on the trail.<sup>11</sup> The extraordinary difficulties of transporting plant materials long distances would remain a major challenge to the development of horticulture on the High Plains.

That fact makes all the more remarkable the stories of the earliest settler women who brought to Nebraska cuttings of their favorite houseplants—geraniums, for example—as reminders of the civilization they had left behind. To be sure, they also collected native plants, providing both food to the table and pleasantness to the home. Along watercourses they could find several species of greens such as lamb's quarter (*Chenopodium berlandieri* Moq.), asparagus (*Asparagus officinalis* L.), and onion (*Allium canadensis* L); on hillsides and

prairie ravines they could find the American plum (*Prunus americana* Marsh.), chokecherry (*Prunus virginiana* L.), red currant (*Ribes cereum* Dougl.), black currant (*Ribes americanum* P. Mill.), buffalo currant (*Ribes odoratum* Wendl.), and bush grape (*Vitis acerifolia* Raf.). In sandy, rocky areas they could find buffaloberry (*Shepherdia argentea* [Pursh] Nutt.) and the sand cherry (*Prunus pumila* L. var. *besseyi*). Their selection of ornamentals for transplanting likely converged on those plants found similar to the plants they knew back East. In addition, we note early descriptions of dugouts and sod houses, both with wildflowers growing on their roofs.<sup>12</sup>

Since the time of the earliest homesteads, horticulture has served a distinctly palliative role in making life more pleasant for women. Unquestionably, loneliness, insecurity, and hard conditions on the High Plains affected women more than men. Testimonials to the salutary effects of horticulture over the harshness of life continued throughout the history of the High Plains. In the thrilling story based on the life of Jules Sandoz, a neighbor returns to his western Nebraska homestead on a cold January day, having been away to earn enough money to support his family, and finds his wife and three children dead. Later, a neighbor woman, helping to prepare for the funeral, reflects sorrowfully on the deceased wife: "If she could [have] had even a geranium—but in that cold shell of a shack" that was not possible.<sup>13</sup>

If one had to choose a single activity to represent the advent of permanent human settlement on the High Plains, it would be tree planting. When settlers began arriving, "[T]rees were so rare in that country," observed Jim Burden, narrator of Willa Cather's *My Antonia*, "and they had to make such a hard fight to grow, that we used to feel anxious about them, and visit them as if they were persons."<sup>14</sup>

Tree planting began in southeastern Nebraska during the 1850s and spread west beyond the 98th meridian by 1860. The earliest tree planters took shade and forest tree cuttings from along watercourses and dug up saplings for transplanting. The earliest fruit trees, however, came from points east of the Missouri River. In 1856, J. Sterling Morton, who would found Arbor Day and later became secretary of agriculture under President Grover Cleveland, imported 500 apple trees for his Nebraska City farm; and Robert W. Furnas, Nebraska's second governor, established the state's first commercial nursery, at Brownville, also in the mid-1850s.<sup>15</sup>

Though partisan political adversaries, Morton and Furnas helped pass the earliest state legislation pertaining to horticulture on the High Plains. By act of the Nebraska Territorial Legislature in 1861, any Nebraska property owner who planted at least 100 fruit or ornamental trees, or 400 forest trees, per acre

received a fifty dollar exemption on the valuation of that property. This act proved so popular that the resulting decline in tax revenues drove the legislature to repeal it in 1864.<sup>16</sup>

While Nebraskans, from east to west, deservedly earned the reputation of tree planters, Coloradoans along the Front Range successfully established themselves as market gardeners and orchardists. The impetus for such horticulture came as a result of the demand for foodstuffs generated by the gold and silver rush into the Rocky Mountains; its development depended on successfully harnessing the water flowing out of the mountains onto the plains. For those who did not see the Front Range before the 1960s, it may be impossible to imagine that at one time, dotted with gardens, farms, and orchards, this was one of the world's great intensive-agriculture regions.

David K. Wall, who arrived in 1859 from Indiana via California, where he had raised and supplied food for miners, is considered the first market gardener to use irrigation in Colorado. He took enough water out of Clear Creek to irrigate about two acres near Golden. Concerning such early irrigation efforts, Elwood Mead, a pioneer irrigation engineer, observed that generally brush and stones were used to deflect streams. Irrigators probably just used a few shovelfuls of earth to make embankments and then shoveled open passages to cultivated plots as water was needed. Wooden and iron headgates to control water flow into ditches came later. By 1862, three years into the Rocky Mountain gold rush, waters for irrigation were being taken out of all the main streams within the upper South Platte watershed: Clear Creek, Boulder Creek, and the St. Vrain, Big Thompson, and Cache la Poudre rivers.<sup>17</sup> Large-scale irrigation projects along the Front Range, however, would not begin until the 1870s, after the passage of legislation regulating water and the creation of irrigation institutions—partnerships, community cooperatives, corporations, and districts.

Market gardening, meanwhile, gained an early publicist in William N. Byers (1831–1903), founding editor of Denver's *Rocky Mountain News*. An outspoken advocate of agricultural and horticultural development, Byers believed that without such production, Denver could never become a major city. On May 7, 1859, during the newspaper's first spring of publication, Byers reported that David Wall of Golden had "left at our office a large supply of garden seed for sale. All ye that wish fresh vegetables walk up and select your packages at 25 cents each." On June 11, Byers acknowledged receiving radishes, which he believed were the first ever grown in Colorado; and on June 25 he announced that locally grown peas, lettuce, and onions were available for purchase. On August 13 Byers reported that "our market is now well sup-

plied with garden vegetables of as fine quality as can be found in the old settlements of the States," which included cabbages, melons, and squashes shipped to Denver from farms in the Arkansas River valley.<sup>18</sup>

Orchards were more difficult to establish than market gardens, in part because of the costs and risks involved in importing the nursery stock by wagon over long distances. In 1862, for example, one Henry Lee brought 6,000 apple cuttings and 500 each of peach, pear, plum, and cherry cuttings from an orchard at Iowa City to his brother's farm near Golden. While we have no record of exactly how Lee transported the cuttings, we do know that fifteen years earlier a pioneer nurseryman named Henderson Luelling left Salem, Iowa, with an ox-drawn wagon packed with 700 fruit cuttings, stopped at Fort Laramie, and reached the Willamette Valley of Oregon after five months on the trail. Approximately half of his cuttings survived the trip, enough for him to start a thriving nursery business that eventually led him to California's Central Valley. Luelling's cuttings had ranged from twenty inches to four feet in height; they were planted in a mixture of soil and charcoal, which held water better than soil alone, in two specially built boxes that took up an entire wagon bed, surrounded for protection by a light but sturdy frame.<sup>19</sup>

As to Lee's stock, we do not know how many trees survived his trip, but we do know that in 1864 he salvaged only 150 after a flood along Clear Creek. He then moved and replanted to nearby upland and by 1866 was again cultivating a thriving orchard. Further north near Bellvue, where the Cache la Poudre River emerges from the mountains, a settler started an orchard in 1862 from imported cuttings, species unknown, transported across the plains; and in 1863 another settler established the first apple orchard in the Big Thompson valley west of present-day Loveland.<sup>20</sup>

Whether market gardeners or orchardists, early growers along the Front Range, generally speaking, were squatters—that is, settlers with no legal title to the land they occupied. To provide themselves with some security against latecomers, speculators, and territorial administrators, these cultivators came together in voluntary, protective associations known as claims clubs. In the case of the Arapahoe County Claims Club, established in 1859, each member publicly stated his claim, giving its geographic description; to confirm the validity of the claim, the member agreed to "make, or cause to be made, improvements on his or their claim, by breaking one acre of land; or building a house sufficiently good to live in."

Because the institution of the claims clubs clearly encouraged horticulture, it is worth reflecting on their nature. We often view the development

of institutions in the arid West as somehow entirely different than those in the East, when, in fact, both are based on the liberal and associational principles that grew out of the eighteenth-century Enlightenment in Europe and America. Witness the familiar ring of the preamble to the bylaws of the Arapahoe County Claims Club: “[W]hereas it sometimes becomes necessary for persons to associate themselves together for certain purposes, such as the protection of life and property; and as we have left the peaceful shade—left friends and homes for the purpose of bettering our condition, we, therefore, associate ourselves together.”<sup>21</sup>

By 1861, claims clubs covered a considerable portion of the Front Range and had gained recognition by both the U.S. Congress and the Colorado Territorial Legislature. By serving as vehicles for resolving conflicts over land ownership until state and federal laws took hold, these voluntary associations promoted more permanent cultivation and, in time, the development of communities.<sup>22</sup>

Consistent with the purpose of the claims clubs, President Abraham Lincoln submitted, and Congress ratified, the Homestead Act in 1862. As with the bylaws of the claims clubs, the Homestead Act did require certain improvements of the land. Essentially, the act provided that any citizen could obtain title to 160 acres of unappropriated public land by residing on or cultivating that land for a period of five years and paying very modest filing fees.

Much has been written about the Homestead Act. While its purpose was lauded by many, its actual impact on the settlement of the High Plains proved not altogether positive. Most immediately, it was used by land promoters who unscrupulously argued that one could sustain a family and produce surplus food for the market on 160 acres of arid land. Loopholes in the act combined with Congress's inaction led to wild land speculation. The impracticability of the act's acre limit stirred Walter Prescott Webb, a westerner, to express the view that “no law has ever been made by the Federal government that is satisfactorily adapted to the arid region.” To this day, Webb's view remains an ever-popular opinion throughout the High Plains.<sup>23</sup>

Were it not for two other major pieces of legislation proposed and signed by President Lincoln, there would be no horticulture as we know it on the High Plains: one creating the United States Department of Agriculture on May 15, 1862, and the other establishing the land-grant colleges, July 2, 1862. In the first, “[T]he general designs and duties of [the department] shall be to acquire and to diffuse among the people of the United States useful information on subjects connected with agriculture in the most general and comprehensive sense of that word, and to procure, propagate, and distribute among

the people new and valuable seeds and plants." In the second, also known as the Morrill Act, each state obtained public land and an appropriation for an agricultural college.<sup>24</sup> Taken together, these two acts launched the federal government's support of scientific research and its application to the practice of agriculture and related fields. The long-term effect on the development of horticulture on the High Plains would be incalculable. Meanwhile, state and local governments had taken certain actions that contributed more immediately to the development of horticulture.

## Notes

1. Willa Cather, *O Pioneers!* (1913; repr. Boston: Houghton Mifflin, 1988), 27–28, 48–49.
2. Charles S. Harrison, *The Gospel of Beauty and Kindred Topics* (York, Neb.: privately printed, 1917), 87.
3. Kelly Kindscher, *Edible Wild Plants of the Prairie, an Ethnobotanical Guide* (Lawrence: University of Kansas Press, 1987), 127; William H. Alderman, ed., *Development of Horticulture on the Northern Great Plains* (St. Paul: Great Plains Region, American Society for Horticultural Science, 1962), 27, 120.
4. Niels E. Hansen, "Some Horticultural Questions," South Dakota Horticultural Society Annual Report (1907): 164.
5. Waldo R. Wedel, "Notes on the Prairie Turnip (*Psoralea esculenta*) among the Plains Indians," *Nebraska History* 59, no. 2 (Summer 1978): 155.
6. Henry A. Gleason, *The New Britton and Brown Illustrated Flora of the Northeastern United States and Adjacent Canada* (New York: New York Botanical Garden, 1952), 2, 330.
7. Edgeley W. Todd, ed., *The Adventures of Captain Bonneville U.S.A. in the Rocky Mountains and Far West Digested from His Journal by Washington Irving* (Norman: University of Oklahoma Press, 1986), 37.
8. James Edwin Bryant, *What I Saw in California, Containing the Complete Original Narrative and Appendix from the 1849 Appleton Edition in True Facsimile* (Palo Alto: Lewis Osborne, 1967), 109. For an exciting, although politically incorrect, account of life around Fort Laramie, see Francis Parkman, *The Oregon Trail* (1849; repr. New York: Literary Classics of the United States, 1991).
9. Quoted in Miller J. Stewart, "To Plow, to Sow, to Reap, to Mow: The US Army Agriculture Program," *Nebraska History* 63 (Summer 1982): 194.
10. Captain Stewart Van Vliet, assistant quartermaster, Fort Laramie, to Major General T. S. Jessup, quartermaster general, Washington, D.C., April 9, 1850, and undated letter, copies, Fort Laramie National Historic Site Library, Fort Laramie, Wyoming (hereafter cited as FL MSS).
11. Major W. Hoffman, Fort Laramie, to Lieut. J. L. Corley, adjutant general, St. Louis, August 10, 1856, FL MSS.

12. Kindscher, *Edible Wild Plants*, 5; Dorothy Weyer Creigh, *Nebraska, a Bicentennial History* (New York: W. W. Norton, 1977), 89–92.
13. Mari Sandoz, *Old Jules, Portrait of a Pioneer* (1935; repr. New York: MJF Books, 1996), 83. For a portrayal of the “spiritual effect” of the Plains on women, see Webb, *The Great Plains*, 505–506.
14. Willa Cather, *My Antonia* (1918; repr. Boston: Houghton Mifflin, 1977), 29; see also Kathleen Norris, *The Cloister Walk* (New York: Riverhead Books, 1996), 287–296.
15. Nebraska State Horticultural Society Proceedings (1872): 11.
16. Everett N. Dick, *Conquering the Great American Desert: Nebraska* (Lincoln: Nebraska State Historical Society, 1975), 85, 117–118.
17. Alvin T. Steinel, *History of Agriculture in Colorado* (Fort Collins: Colorado State Agricultural College, 1926), 180; Robert G. Dunbar, *Forging New Rights in Western Waters* (Lincoln: University of Nebraska Press, 1983), 122.
18. Steinel, *History of Agriculture*, 180–183; Byers quoted in Leroy R. Hafen, ed., *Colorado and Its People* (New York: Lewis Historical Pub., 1948), 1:182 (first two quotes), 1:183 (last quote).
19. J. S. Stranger, “Reminiscences of Orcharding in Colorado,” Colorado State Board of Horticulture Annual Report 14 (1902): 101; Thomas C. McClintock, “Henderson Luelling, Seth Luelling and the Birth of the Pacific Coast Fruit Industry,” *Oregon Historical Quarterly* 60, no. 2 (June 1967): 156–157.
20. Ansel Watrous, *History of Larimer County, Colorado* (Fort Collins: Courier, 1911), 143; Winona W. Taylor, “Progress of Horticulture in the Big Thompson Valley,” Colorado State Board of Horticulture Annual Report 1 (1889): 293.
21. Quoted in Hafen, *Colorado and Its People*, 1:214.
22. Steinel, *History of Agriculture*, 43–45.
23. Webb, *The Great Plains*, 398–399.
24. Gladys L. Baker and others, *Century of Service: The First 100 Years of the United States Department of Agriculture* (Washington, D.C.: United States Department of Agriculture, 1963), 13.