

WITH LOCAL AND MINOR EXCEPTIONS, THE LANDS BEYOND THE HUNDREDTH MERIDIAN RECEIVED LESS THAN TWENTY INCHES OF ANNUAL RAINFALL, AND TWENTY INCHES WAS THE MINIMUM FOR UNAIDED AGRICULTURE. THAT ONE SIMPLE FACT WAS TO BE, AND IS STILL TO BE, MORE FECUND OF SOCIAL AND ECONOMIC AND INSTITUTIONAL CHANGE IN THE WEST THAN ALL THE ACTS OF ALL THE PRESIDENTS AND CONGRESSES FROM THE LOUISIANA PURCHASE TO THE PRESENT.

—Wallace Stegner
*Beyond the Hundredth Meridian*¹



Abandoned homestead,
Choteau County, 1930

Alta Derrin, photographer



Optimism ran high in the early decades of the twentieth century as Montanans, including Cascade County's Greenfield Bench dryland farmers rallying near the Sun River circa 1910 to protest an expensive irrigation project, placed their faith in a new system of cultivation called dryfarming that offered a remedy to drought. Touted by virtually every Montana organization supplying information about farming conditions in Montana, dryfarming proved inadequate to counter the effects of a five-year drought that began in 1917.

Unless otherwise noted, photographs courtesy MHS Photograph Archives, Helena

Homestead failure is one of the most poignant episodes in the history of the Great Plains. In Montana alone, nearly 200,000 homesteaders founded new farms between 1900 and 1921, raising the population of eastern Montana to over 250,000 in 1920; yet, despite high hopes, a severe five-year drought that began in 1917 crippled wheat production and sparked an exodus from the state.² Ultimately, some 60,000 Montana homesteaders gave up, and land that once held such promise was taken out of production or auctioned off to pay loans and taxes.³ The frame skeletons of deserted homes and empty schoolhouses that today dot the Montana landscape remain as testimony to dashed expectations, bankruptcies, and the depopulation of the region.

In the face of this calamity, the puzzle remains why so many settlers moved to a place that turned

out to be so inhospitable. After all, drought should not have been a surprise. Earlier in the century the Great Plains were known as the “Great American Desert,” and by the turn of the twentieth century the optimistic notion that “rain follows the plow” had been fairly well discredited.⁴ Most historians of the period have assigned blame to railroad propaganda and the gullibility of homesteaders: journalist Joseph K. Howard labeled Montana homesteaders naive fools while historian K. Ross Toole more diplomatically suggested that they were the victims of railroad hyperbole and outright lies.⁵ A more likely explanation is that homesteaders were emboldened by advice from agricultural professionals who believed that a new scientific farming method called dryfarming offered a remedy to drought.⁶

Clarence Bull photography



Learning about the Weather Dryfarming Doctrine and Homestead Failure in Eastern Montana, 1900–1925

by Gary D. Libecap

Dryfarming doctrine represented the Progressive era's optimistic belief in the power of practical science to tame nature and bend it to meet human needs. Proponents of "scientific soil culture" predicted that vast areas could be opened for settlement, not only in United States but throughout the world, and that farmers would grow wheat and other crops in "the natural habitat of cactus." Dryfarming "was moving onward to conquer the waste places of the earth, noted John Widtsoe, a dryfarming proponent and president of Utah Agricultural College."⁷

After the turn of the century, the doctrine of dryfarming spread rapidly throughout the Great Plains. Although it was common knowledge that eastern Montana could be dry, dryfarming advocates claimed that if farmers followed certain cultivation techniques, sufficient moisture could be saved in the soil to pull a farm through any rainless period. "[T]he farmer will always have a crop: in the wet years his crop will be large; in the driest year it will be sufficient to sustain him," claimed Widtsoe in 1911.⁸

According to the theory, deep plowing in fall and spring captured precipitation and sent it far into the soil where it was saved for plants, rather than allowing the moisture to be lost as runoff as it would be with shallower tillage. Over time, the saved water percolated upward through capillary action toward plants' thirsty roots. Cultivating and subsurface packing after every rain prevented the soil from crusting and maintained a protective mulch that kept the moisture from evaporating. Indeed, advocates asserted that too much evaporation rather than too little rainfall was the critical problem in semi-arid regions. Crop failure occurred only

if a farmer did not perform the required work, an outcome attributable to an individual's shortcomings, not to the Great Plains' climate.⁹

Dryfarming doctrine was attractive to homesteaders not only because it offered a solution to the problem of drought but also because it promised high yields through intensive cultivation, which encouraged the formation of small family farms. There was a strong bias toward small homesteads among advocates, and their arguments were part of the debate over whether and how much the 1862 Homestead Act should be modified to meet the drier conditions of the Great Plains.¹⁰ The opportunities made possible through dryfarming surely helped limit major changes in land laws. Rather than the 2,560-acre homesteads recommended for arid regions by John Wesley Powell in 1878, Congress made only minimal adjustments to the Homestead Act, allowing claims of 320 rather than 160 acres in 1909 and reducing the residency requirement from five to three years in 1912.

Virtually every organization supplying information to homesteaders on the Great Plains between 1900 and 1920 emphasized dryfarming principles, and many advocates had at least some scientific credentials, which gave their ideas an air of scientific credibility. The most prominent supporter was South Dakota farmer Hardy Webster Campbell. Campbell organized the Western Agricultural Improvement Society in 1895 to promulgate dryfarming techniques and wrote a series of monographs on the subject between 1902 and 1916.¹¹ He later supervised demonstration farms for the Northern Pacific and Chicago, Burlington and Quincy railroads and published a journal, *The Western Soil Culture*. Other prominent dryfarming supporters included B. C. Buffin, professor of agriculture at the University of Wyoming and director

Minnesota Historical Society, St. Paul



Author of four books on dryfarming and a frequent speaker at dryfarming congresses that provided the latest information on the subject, Hardy W. Campbell (left) was a tireless promoter of "scientific soil culture" and its application to the arid West. Below, a homesteader and her son near Glendive, Montana, in 1911 stand amidst the plenty that Campbell's principles seemed to guarantee.

Foster, photographer



Montana Agricultural Experiment Stations



of the Wyoming Agricultural Experiment Station; Thomas Shaw, professor of animal husbandry at the University of Minnesota; V. T. Cooke, whose work was published by the Wyoming Dry Farming Commission; and F. H. King of the Wisconsin Agricultural Experiment Station.

For eastern Montana homesteaders, however, information about dryfarming came mostly from officials of the Montana Agricultural Experiment Station in Bozeman. Created by the Hatch Act in 1887, agricultural experiment stations provided general information about new crops and products and promoted new practical technologies. The Agricultural Extension Service, established by the

Smith-Lever Act in 1914, aided in these tasks. As a part of its outreach programs, the Montana Agricultural Experiment Station set up demonstration farms to showcase new crops, equipment, and dryfarming cultivation practices, and by 1910, thirteen of these farms were conducting dryfarming tests in the state.

To provide farmers the latest scientific knowledge, the Montana experiment station annually organized Farmers'

1. Wallace Stegner, *Beyond the Hundredth Meridian: John Wesley Powell and the Second Opening of the West* (Boston, 1954), 214.

2. Totals for original homestead entries are from *Annual Report of the Commissioner of the General Land Office* (Washington D.C., 1880-1925); populations from the 1900 and 1920 U.S. Population Censuses. Eastern Montana counties included follow the designation used by Mary W. M. Hargreaves, *Dry Farming in the Northern Great Plains, 1900-1925* (Cambridge, Mass., 1957). Between 1880 and 1925, the abundant free land, generally rich soil, and remarkable wheat yields of the central and northern Great Plains attracted migrants who filed over a million new homestead claims to government land.

3. The magnitude of homestead failure is described in K. Ross Toole, *Montana: An Uncommon Land* (Norman, 1959), 238; Joseph Kinsey Howard, *Montana: High, Wide, and Handsome* (New Haven, Conn., 1959), 207-8; Michael P. Malone, Richard B. Roeder, and William L. Lang, *Montana: A History of Two Centuries* (Seattle, 1991), 283; and Dan Fulton, "Failure on the Plains," *Agricultural History*, 51 (January 1977), 51-63. See also David C. Jones, *Empire of Dust: Settling and Abandoning the Prairie Dry Belt* (Calgary, 1987), 100-14, for a description of farm failure in Canada.

4. For discussion of "rain follows the plow," see Henry Nash Smith, "Rain Follows the Plow: The Notion of Increased Rainfall for the Great Plains, 1844-1880," *Huntington Library Quarterly*, 10 (February 1947), 169-93; Henry Nash Smith, *Virgin Land: The American West as Symbol and Myth* (Cambridge, Mass., 1950), 174; and Stegner, *Beyond the Hundredth Meridian*, 215-19.

5. Howard, *Montana*, 181-96; Toole, *Montana*, 232-34. Similar views of naive homesteaders and overpromotion by the railroads are provided in Malone, Roeder, and Lang, *Montana*, 238-40; and Richard White, *"It's Your Misfortune and None of My Own": A History of the American West* (Norman, 1991), 142-53.

6. This paper benefits from a larger study by Gary D. Libecap and Zeynep Hansen, "'Rain Follows the Plow' and Dryfarming Doctrine: The Climate Information Problem and Homestead Failure in the Upper Great Plains, 1890-1925," forthcoming in *Journal of Economic History*.

7. Quoted in Roy V. Scott, *Railroad Development Programs in the Twentieth Century* (Ames, Iowa, 1985), 33; John A. Widtsoe, *Dry-Farming: A System of Agriculture for Countries under a Low Rainfall* (New York, 1911), 361. Campbell claimed that the onetime American desert would be the greatest agricultural region of the world. Campbell, *Soil Culture Primer*, 9-10. Similarly, B. C. Buffin argued that "evolution always leads towards greater perfection." Buffin, *Arid Agriculture: A Handbook for the Western Farmer and Stockman* (Laramie, Wyo., 1909), 11-12.

8. Widtsoe, *Dry-Farming*, 402.

9. See Hardy Webster Campbell, *Campbell's 1902 Soil Culture Manual* (Holdrege, Nebr., 1902), p. 6, for discussion of percolation and capillary action. For more on the key role of capillary action, see Widtsoe, *Dry-Farming*, 283; and E. B. Parsons, *Parsons on Dry Farming* (Aberdeen, S.Dak., 1913), 17, 44. See also Webster H. Campbell, *Soil Culture Primer* (Lincoln, 1914), pp. 66-83, for additional discussion of the principles of moisture storage. Campbell claimed that dryfarming cultivation in arid areas actually could result in yields three times higher than those found in humid areas because nutrients were not leached from the soil.

10. Campbell opposed larger farms, claiming that they were not family farms and were not productive. Campbell, *Campbell's 1902 Soil Culture Manual*, 5. Richard B. Roeder discusses Montana promoter Paris Gibson's emphasis on dense small farm settlement in "A Settlement on the Plains: Paris Gibson and the Building of Great Falls," *Montana The Magazine of Western History*, 42 (Autumn 1992), 4-19. See Stegner, *Beyond the Hundredth Meridian*, 219-42, for analysis of the political controversy over homestead size and efforts to adjust the federal land laws.

11. Campbell's books include *Campbell's 1902 Soil Culture Manual*; *Soil Culture Primer*; *1907 Soil Culture Manual* (Lincoln, 1907); and *Progressive Agriculture, Tillage, Not Weather Controls Yield* (Lincoln, 1916).



The Northern Pacific Railroad encouraged dryfarming and even sponsored special agriculture trains to provide instruction to farmers along its route, but for eastern Montana homesteaders, information about dryfarming came mostly from Montana agricultural experiment stations. By 1907, 12,000 farmers had attended Farmers' Institutes. At left, Professor H. L. Bolley gives a lecture on cultivating flax circa 1914. Below, Montana State College professors demonstrate the treatment of flax seed for farmers in Circle, Montana.

Institutes in most eastern Montana counties. During 1901-1902, the station held 17 institutes, and by 1907, 12,000 farmers had attended 154 such meetings. At Farmers' Institutes, experiment station personnel assured homesteaders that even in eastern Montana where annual rainfall was about 13 inches, irrigation was "not necessary" in many places and that good crops could be grown through the use of dryfarming practices. During droughts, lower, but adequate, yields could be maintained.¹²

As part of its effort to educate people about dryfarming, the Montana Agricultural Experiment Station distributed numerous short publications containing specific information about precipitation levels, farming techniques, and crop yields. Essays with titles such as "Cultural Methods Adapted to Dry Land Conditions," "The Dry Farm Unit," "Problems of Dry Farming in Montana," "Attend to the Fallow," "Dry Farming Principles," and "Suggestions to the Dry Farm Homesteader" explained what crop types grew best and what new varieties were under consideration, the use of summer fallow, the results of rotation experiments, and provided testimonials from established dryland farmers. Optimis-



tic in their prescriptions for the success of small dryland homesteads, these publications repeated or closely followed the principles advocated by Campbell, Widtsoe, Buffin, and others.¹³

Prospective settlers commonly wrote to the experiment station requesting a variety of information about the availability of land, cultivation practices, the weather (especially rainfall), the capital requirements to start a new farm, and how to locate other sources of information. For example, in a letter dated May 25, 1916, prospective homesteader B. D. Bundy, who had recently arrived in Glasgow, Mon-

12. Montana Farmers' Institutes, *Second Annual Report* (Bozeman, Mont., 1903), 201-3. See also correspondence from the Montana Agricultural Experiment Station to G. H. Carroll, January 5, 1911, file AC-F4, box 1, Collection 00004, M. L. Wilson Files, Plants and Soils, Merrill G. Burlingame Special Collections, Montana State University Libraries, Bozeman (hereafter Wilson Files); Montana Farmers' Institutes, *Third Annual Report* (Bozeman, Mont., 1904), 197-205; F. B. Linfield, *Bulletin of the Montana Farmers' Institutes: Organization of Farmers' Institutes and Announcement of Meetings for the Winter 1904-5* (Bozeman, Mont., 1905), 4; Montana Agricultural Experiment

Station, *Ninth Annual Report* (Bozeman, Mont., 1902), 17; Montana Farmers' Institutes, *Sixth Annual Report* (Bozeman, Mont., 1908), v.

13. Montana Agricultural Experiment Station publications, 1912-1913, file AF-F6, box 3, file AH-F2, AH-F7, box 4, Wilson Files. Other experiment results from demonstration farms and suggestions for crops and techniques were provided in Alfred Atkinson, "Crop Growing Suggestions to Dry Land Farmers," in *Montana Agricultural College Experiment Station Circular 45* (Bozeman, Mont., 1915), 121-38; and Alfred Atkinson and J. B. Nelson, "Dry Farming Investigations in Montana," in *Montana Agricultural College Experiment Station Bulletin No. 74* (Bozeman, Mont., 1908), 69-85.

tana, posed a series of questions to Alfred Atkinson of the Montana Agricultural Experiment Station: "Do you think a family can make a living on 160 acres of land in Valley Co. Mont? Which would be the best way to farm this land? What rotation would be the best for grain farming on this land? Should it be summer fallowed every other summer or every third summer? Or not at all? Would it be best to use the land for grazing? Would tame hay do well in the dry years?"¹⁴

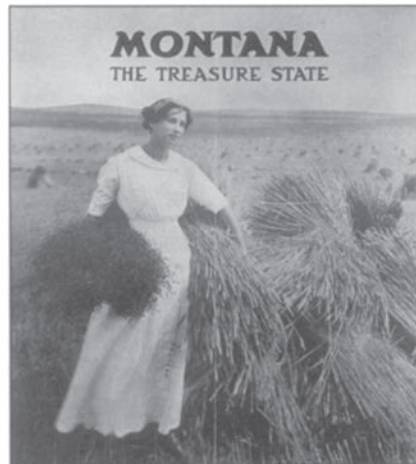
In his May 30 response, Atkinson commented: "Replying to your letter of recent date in which you ask my opinion of the possibility of a family making a living on 160 acres of land in Valley county, [I] would say that I know of instances in the state where very good returns are being made on 160 acres of dry land." He suggested placing most of the land in wheat and some in alfalfa and offered to send a circular, *Crop Growing Suggestions to Dry Land Farmers*, adding: "You will note the methods of crop management which we recommend." If the homesteader followed these suggestions and added some livestock and garden "stuff," Atkinson promised "a pretty fair income." Similarly, in a 1909 letter Atkinson assured H. H. McKimney of Des Moines, Iowa, that "as a result of our observations and investigations on the Stations, we are convinced that dry farming has come to stay, and is just as reliable as any other class of farming."¹⁵

The Montana Bureau of Agriculture, Labor, and Industry, later known as the Department of Agriculture and Publicity, also provided homesteaders with general information on farming conditions. The agency's 1906 report declared that in fifteen years of wheat farming in Cascade County there had never been an entire crop failure on nonirrigated farms, although droughts could cut

yields in half. Beginning in 1908, the bureau advertised dryfarming as the poor man's alternative to expensive irrigation provided by federal reclamation projects.¹⁶

Anxious to draw people to their area, local communities, land developers, and professional homestead locators advertised the advantages of their locale. The Glasgow Commercial Club claimed that the nearby land was "very productive without irrigation and the increased yields by irrigation makes it one of the richest valleys in the world." Miles City developer E. B. Milburn's flier "Eastern Montana Farm Lands" summarized the types of crops grown, comparative yields, rainfall, the availability of private and government land, and testimonials from satisfied farmers "who are glad they came to Montana."¹⁷ Such advertisements were distributed at agricultural fairs and traveling railroad exhibits and published in newspapers, farm journals, and railroad magazines.

Established in 1907 as a regional meeting of dryfarming proponents, the Dry Farming Congress introduced the latest information about dryfarming to thousands of farmers. At the meetings, speakers from throughout the Great Plains, and in some cases from foreign countries such as Australia, outlined the opportunities afforded through dryfarming and discussed new dryfarming techniques and crops.¹⁸ Often leading dryfarm proponents, agricultural experiment station personnel, and local politicians, including the governors of Colorado, Montana, and Wyoming, addressed the assemblies. The annual conventions enjoyed wide appeal with meeting sites including Denver in 1907, Salt Lake City in 1908, Cheyenne in 1909, Billings in 1909, Spokane in 1910, Colorado Springs in 1911, Lethbridge in 1912, Wichita in 1914, Denver in 1915, and El Paso in 1916. Five hundred delegates attended the third congress 1909, and in 1912, the Dry Farming Congress reported 15,000 members.¹⁹



A key component of propagating dryland farming principles was advertising, and the Great Northern Railway's *General Information about Montana: A Homesteader's Guide* (above) was typical of the genre.

14. B. D. Bundy to Alfred Atkinson, May 25, 1916, file AC-F4, box 1, Wilson Files. Atkinson was appointed president of Montana State College of Agriculture and Mechanical Arts in 1919.

15. Ibid.; Alfred Atkinson to B. D. Bundy, May 30, 1916, file AB-F9, box 1, Wilson Files.

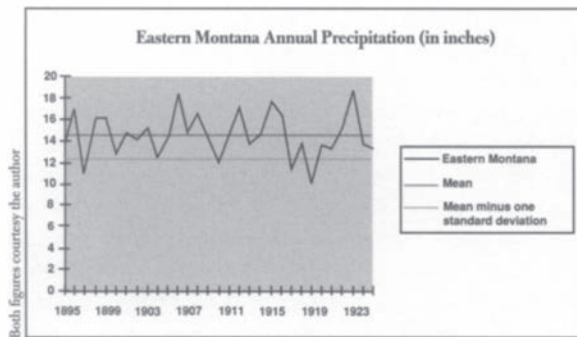
16. Montana Bureau of Agriculture, Labor, and Industry, *Tenth Annual Report* (Helena, Mont., 1906), 311; Montana Bureau of Agriculture, Labor, and Industry, *Eleventh Annual Report* (Helena, Mont., 1908), 3.

17. Glasgow Commercial Club, *Valley County: A Description of Location, Soil, Moisture, and Productiveness* (Glasgow, Mont., 1914), p. 3, pamphlet, PAM 406, Montana Historical Society Library, Helena (hereafter MHS); E. B. Milburn, *Eastern Montana Farm Lands* (Miles City, Mont., n.d.), copy in file AB-F6, box 4, Wilson Files.

18. Board of Control, *Third Dry Farming Congress* (Cheyenne, Wyo., 1909), 9-46.

19. Karl Quisenberry, in "The Dry Land Stations: Their Mission and Their Men," *Agricultural History*, 51 (January 1977), pp. 218-28, claimed that 10,000 attended the 1912 Dry Farming Congress in Lethbridge. Other sources claim that the congress had 15,000 members at the time. Board of Control, *The Seventh International Dry Farming Congress, 1912* (Lethbridge, Alberta, 1912), 31, copy in file AF-F4A, box 3, Wilson Files. Given the population of the region, the numbers are indicative of the movement's popularity. As a part of their effort, the congress's leadership lobbied the federal government for funding for dryfarming investigations.

FIGURE 1



Railroads, such as the Northern Pacific, Great Northern, and the Chicago, Milwaukee, St. Paul and Pacific (known as the Milwaukee Road), were another important source of information about farming prospects in eastern Montana. As every student of Montana history knows, the railroads encouraged the state's homestead boom by assuring homesteaders that they need not fear droughts. "The fact has been demonstrated beyond any reasonable doubt that the yields . . . can be greatly increased and often doubled by the intelligent cultivation of the soil, and not only increased in amount but the yield rendered sure," asserted a 1911 Northern Pacific publication.²⁰ Buoyed by this belief, railroads disseminated fliers and brochures advertising farmers' testimonials and the results of dry-farming investigations throughout the United States and Europe.

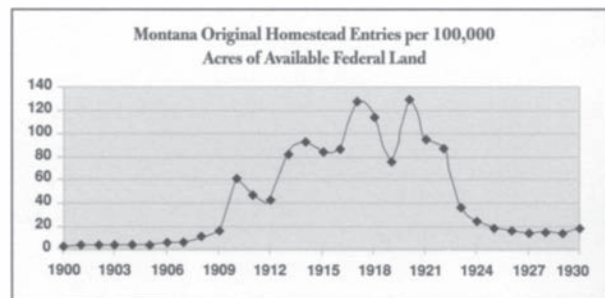
Railroads also contributed funding for dryfarming investigations on both private demonstration farms and state experiment stations. In 1905 and 1906 the Northern Pacific Railroad and Great Northern Railway respectively allocated \$2,500 and \$2,000 for "cooperative tests on dry bench lands." The State of Montana soon joined the railroads in funding these efforts. In 1909 the State appropriated \$11,000 for demonstration farms with the Northern Pacific providing an additional \$5,000 and the Great Northern and the Milwaukee Road each \$2,000. By 1911 appropriations totaled \$16,250 and that figure rose to \$22,750 in 1913.²¹

But the railroads went beyond the development and dissemination of dryfarming doctrine. Railroad companies used experiment station research to sell Great Plains land through a major advertising blitz aimed at an international audience. In 1914, for example, the Chicago, Rock Island, and Pacific Railroad hired dryfarming authority

20. Northern Pacific Railroad, *Western North Dakota: Being a Description of a Land of Great Promise and the Opportunities It Holds for Homeseekers*, (St. Paul, Minn., [1911]), p. 15, pamphlet, PAM 2097, MHS.

21. Montana Agricultural Experiment Station, *Thirteenth Annual Report* (Bozeman, Mont., 1907), 109-13; Montana Agricultural Experiment Station, *Sixteenth Annual Report* (Bozeman, Mont., 1910), 65,

FIGURE 2



Henry M. Cottrell, director of the Colorado Agricultural Experiment Station and organizer of the Colorado Farmers' Institutes, to head its agricultural development department and spread word about the availability of fine low-cost farmland. To speed settlement, railroads created immigration departments and provided immigrant trains as a low-cost means of transporting household goods and farm equipment westward. They also provided, at cost, cuttings and seeds for crops such as alfalfa, corn, wheat, barley, and rye that seemed suited to the northern plains. Farmers received free transportation to Farmers' Institutes, and they visited demonstration trains such as the Better Farming Special the Chicago, Burlington and Quincy Railroad sent to sixty-five towns in Montana, Wyoming, South Dakota, and Nebraska in February 1914 to spread the word about moisture-saving techniques.²²

Dryfarming doctrine and homesteading bloomed together and they jointly wilted between 1917 and 1921. The five-year drought of this period stands out for both the severity of the precipitation shortfall and for its length. The average rainfall in eastern Montana for the thirty years between 1895 and 1925 was a little above 14 inches (see FIG. 1). During the drought years, rainfall fell below 12 inches, far too little for most crops, particularly if dry weather occurred during the growing season, and well below what the United States Department of Commerce's Weather Bureau defined as a severe drought.²³ These statistics illustrate two important points about precipitation in eastern Montana in the early part of the twentieth century: Except for one-year droughts in 1904 and 1910, precipitation through 1916 was at or above average, and, indeed, the period between 1906

69-70; Montana Agricultural Experiment Station, *Eighteenth Annual Report* (Bozeman, Mont., 1912), 115-16.

22. Scott, *Railroad Development*, 8, 12-13; Richard C., Overton, *Burlington Route: A History of the Burlington Lines* (New York, 1965), 283-85. See also documents of support from the railroads for the Montana experiment station and dry farm substations in files AA-F8, AB-F1, AC-F1, AC-F4, box 1, Wilson Files.



Homesteaders with 160- or 320-acre claims could ill-afford the income shortfall that resulted from a dry growing season. With her finely crafted chairs and curtains, homesteader Rosie Roesler, pictured here with friends on August 31, 1913, exhibits her hard-earned domesticity. Even four years before the drought started making survival tenuous, Roesler walked to the town of Marsh, six miles away, to wash clothes and do other housework to earn extra money.

and 1916 was the wettest of the twentieth century. Conversely, during the five years that followed, the drought was so severe that nothing comparable occurred until the 1930s.

The drought appeared with a dry spring in 1917. Optimism among experiment station officials and homesteaders remained high, however, and farming continued as normal. Dryfarming doctrine inspired confidence that the drought could be withstood, and had it ended quickly, the doctrine probably would have been sustained much longer. Farmers endured droughts in 1904 and 1910 with little hardship, and this experience seemed to validate claims that the new techniques could successfully capture enough water in the soil to carry a small farmer through a drought year. In fact, Montana homesteaders made over 15,000 new land entries in 1917, more than in the previous year which had been much wetter, and settlers continued to arrive through the early 1920s (see FIG. 2).

By 1919, however, many observers, including Montana experiment station personnel, finally acknowledged

the unpredictability of drought. "Weather conditions beyond the expectation of any student of weather reports the past 40 years in this state have fallen upon Montana," noted the *Denton Recorder* in September 1919. For the first time, station officials doubted the ability of dryfarming techniques to guarantee a moderately successful crop.²⁴ In a further shift, by 1920 experiment station publications claimed that drought could be expected "rather frequently," and by 1921, they questioned the effectiveness of dryfarming doctrine.²⁵

Moreover, the drought cast doubt on the feasibility of small dryland farms. Montana Agricultural Experiment Station director F. B. Linfield claimed in 1924 that the distribution of marginal lands via the homestead acts had been a mistake and that successful farming in dry areas required "two to four times the area of the land named in the National Homestead Acts."²⁶ Larger farms could diversify into livestock to help maintain income when wheat yields were down, and they could better afford to place land in fallow, which was an effective means of building up soil moisture. Homesteaders with 160- or 320-acre

23. Rainfall data for eastern Montana, 1895–1947, compiled from United States Department of Commerce, Weather Bureau, *Climatological Data, Montana Section*, vol. 50, no. 13 (Helena, Mont., 1947), 75. A common designation of a severe drought is precipitation one standard deviation (a measure of variability) below the average.

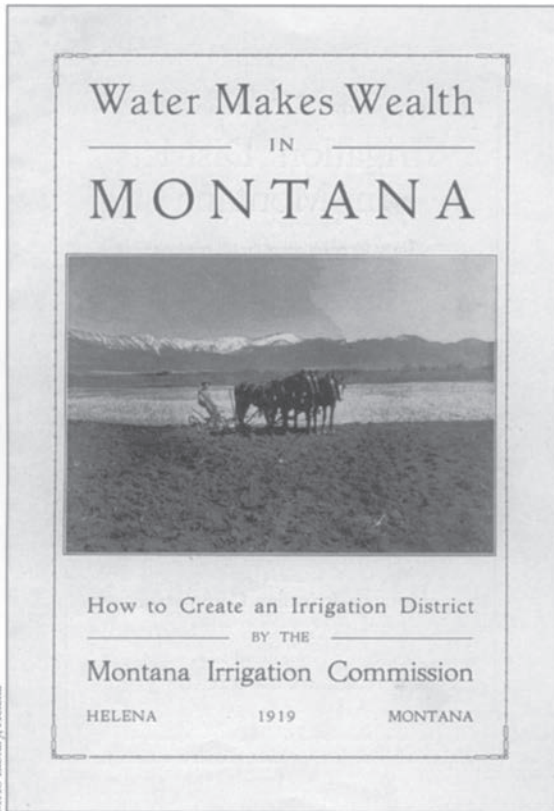
24. *Denton (Mont.) Recorder*, September 1, 1919; Montana Agricultural Experiment Station, *Twenty-Sixth Annual Report* (Bozeman, Mont., 1920), 8. The July 14, 1919, *Fairview (Mont.) News* said that the drought is "without precedent in the weather records of this state."

25. Montana Agricultural Experiment Station, *Twenty-Seventh Annual Report* (Bozeman, Mont., 1921), 7; Montana Agricultural Experiment Station, *Twenty-Eighth Annual Report* (Bozeman, Mont., 1922), 57.

26. Montana Agricultural Experiment Station, *Thirtieth Annual Report* (Bozeman, Mont., 1924), 8; F. B. Linfield, *Thirty-Second Annual Report* (Bozeman, Mont., 1926), 6.

27. John H. Rich, *The Economic Position of Agriculture in the Northwestern Grain Raising Area* (Minneapolis, 1923); Roland R. Renne, "Montana Farm Bankruptcies," in *Montana Agricultural Experiment Station Bulletin No. 360* (Bozeman, Mont., 1938), 20; Roland R. Renne, "Montana Farm Foreclosures," in *Montana Agricultural Experiment Station Bulletin No. 368* (Bozeman, Mont., 1939), 17.

28. Howard, *Montana*, 207-8.



farms did not have the luxury of leaving much land in fallow. They required continuous production from the entire farm to make a living.

The drought devastated homesteaders. Average wheat yields dropped from over 26 bushels in 1915 to less than 3 bushels per acre in 1919, and on many small farms, there was no crop at all. Between 1919 and 1921, farmers had difficulty producing enough to sustain their families, let alone sufficient income to pay banks for loans and local governments for accrued taxes. Plummeting wheat prices after the end of World War I meant that what little could be grown sold for much less than it had a few years earlier. Loan defaults and foreclosures followed.

Although these problems confronted farmers throughout the upper Great Plains, eastern Montana homesteaders were most affected. The region had the nation's highest rates of loan foreclosure, farm abandonment, and bank failure due to unpaid loans.²⁷ Howard, in his polemical *Montana: High, Wide, and Handsome*, estimated that over 11,000 farms, or one out of five, failed and approximately 2 million acres of land went out of production.²⁸ The remaining farmers consolidated the small landholdings into larger farms. Once-flourishing towns withered. School districts created in anticipation of growing enrollment instead closed facilities and consolidated. Not surprisingly, Montana became less attractive to immigrants. The number of

In a land subject to recurring droughts, irrigation offered a reliable, though by no means guaranteed, alternative to dryfarming. The pamphlet above proposed that irrigation could help alleviate the effects of a drought that was driving the homesteaders off their claims. Below, the Gardiner family poses on hard-used land.





new homesteads declined in 1921 and 1922 and then fell sharply in 1923, never to rebound.

The claim made by most histories of the period that railroads knowingly misled settlers with extravagant claims about dryfarming prospects is incorrect. The railroads were not mere publicists, indifferent to the outcome of homestead migration. The railroads funded scientific research in order to promote the settlement of their service areas and, in the case of the Northern Pacific, to sell land. Rather than duping fools, the railroads hoped to address the difficult conditions of the region and thereby create a permanent population of farmers who would ship and receive goods via their rail lines. The railroads had a stake in successful homesteads. Widespread agriculture failure reduced the attractiveness of the area and, hence, the value of railroad investment in the upper Great Plains. Like farmers, railroads had relied on the limited scientific information about dryfarming prospects and weather provided by the experiment stations. Unfortunately, their information proved to be too incomplete and optimistic for the drought conditions that unfolded between 1917 and 1921.

The legacy of the drought was a more somber assessment by all parties—farmers, experiment station personnel, local promoters, and railroad officials alike—of what it would take to succeed in farming in eastern Montana. Some dryfarming techniques such as the use of fallow were shown to be valuable tools for agriculture in a semi-arid region. But all agreed that practical science could only go so far in mitigating the weather of the Great Plains. No longer was it believed that dryfarming cultivation could store enough moisture in the ground to defeat drought. The risks of the region's climate remained, and farmers would have to adjust to it. *M*

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In the rural West dilapidated houses and outbuildings, weathering and usually forgotten, stand as reminders of how poorly homesteaders understood Montana's climate. Historians' claim that railroad officials unscrupulously lured homesteaders to land they knew to be too arid for farming is untrue; farmers, local promoters, experiment station personnel, and railroad officials had relied on the limited scientific information available and the result was a somber reassessment of what it would take to succeed in farming in eastern Montana.



State Historic Preservation Office, Helena