

Breaking Sod or Breaking Even? Flax on the Northern Great Plains and Prairies, 1889–1930

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A new thirst for paint and color in cities made extensive flax production profitable in the northern Great Plains and Prairies and contributed to the cultivation of the most fragile grassland ecosystems. The production of flax seed for linseed oil became an early spin-off of the Prairie wheat economy but, unlike wheat, flax vanished from old land after one or two rotations and reappeared in districts with the most new breaking. Officials explained the migrant crop as preparing native grasslands for cultivation or exhausting soil in old land, but farmers brought flax to their new breaking for other reasons. Producers would only put flax on any land when a range of economic and environmental conditions were in place. It was never sown without promise of adequately high prices or in the absence of affordable seed and other inputs. When price allowed, it usually appeared on new breaking because it could be planted later and transported further without upsetting the balance of other activities and without farmers learning many new techniques. Scientists discovered that diseased soil drove flax off old land, not soil exhaustion. Circumventing the disease was possible but costly, and farmers simply replaced flax with the next most lucrative commodity.

IF WHEAT MADE THE NORTHERN Great Plains the breadbasket of North America, then flax seed made Saskatchewan, Montana, and North Dakota the continental paint bucket. In 1910 flax was the third most valuable cultivated crop in the three Prairie provinces, and afterward it was briefly the second most valuable grain in Canada. A crop of similar

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size had been produced each year in the United States for over three decades, and after 1910, the two countries' outputs followed similar trends. Flax in the West was not grown for fiber, but for seed. The seed produced linseed oil and, with more processing, paint and varnish.¹

Unlike wheat, flax was grown mostly on new land and then abandoned for other cereals. Some officials even promoted flax as a living instrument of plains pioneering, a crop that prepared and broke down the soil, even if it seemed to lead quickly to soil exhaustion for flax production itself. County-level aggregate data show the constant migration of the center of flax production, and a broad spatial analysis maps its relationship to newly plowed land. The Prairie flax story demonstrates farmers' surprising involvement in commodity chains outside of wheat and other foodstuffs and their conversant manipulation of grassland ecosystems from the first days of settlement.²

The semi-arid farm regions of the Dakotas, Saskatchewan, and Alberta were initially considered unproductive. Early Canadian observers of this area, later dubbed Palliser's Triangle, declared it too arid for cultivation. However, in 1880, John Macoun's second western expedition for the Canadian government took him through the dry belt of the Prairies. There he decided that the dry grasslands could be farmed profitably and would benefit from breaking and prolonged cultivation—exactly what his expansionist sponsors wanted to hear. Bill Waiser has argued that Macoun's “‘rains follow the plough’ notion was fraught with difficulties [and] created the false impression that bringing the shallow and light soils of the second and third prairie steppe into agricultural production was a simple matter of cultivation.” In fact, these drought-prone areas would require “special techniques” for prolonged cultivation, techniques now canonized in the story of environmental hazards, technological and scientific triumphs over nature, and eventual abandonment of areas too arid for cultivation. Along with the development of dry-farming and early-maturing and drought-resistant varieties, flax cultivation was another element of adaptation to grassland ecosystems.³

Flax producers grew the crop largely for distant markets. They used some seed medicinally, and some women used boiled flax seed as a wave-set for hair styling, but of all grains, flax was probably the least suitable for on-farm consumption. The first stage of flax seed production included preparing the land, sowing, harvesting, and threshing the mature crop.

Marketing the seed meant transporting it to the nearest grain elevator, where it was then distributed to manufacturers. Millers crushed the seed, making linseed oil. A byproduct—linseed meal—was used for livestock feed. Finally, linseed oil became the primary drying ingredient in paint, varnish, and other surface coverings, and was sold to consumers in those forms.⁴

Farmer adoption of flax cultivation was part environmental adaptation, part business strategy. A farmer's land use system operated like a differential equation with environmental, economic, cultural, technological, and demographic variables. Contemporary observers and some recent scholars saw seeding flax on new breaking as a transplanted American activity. This cultural argument rests on the assumption that, although settlers moved from one agricultural region to another, their farming practices did not deviate from those in their places of origin. Expert discourse at the time encouraged prairie settlers to transplant an eastern style agricultural system to the West, and economists and geographers today use place of origin as a measurement for plains migration and land use. However, it is unlikely that farmers naïvely assumed new wine would keep in old wineskins—or that traditional land use would work in new environments. People brought practices with them, but they also evolved with every stop in their journey.⁵

A better explanation for choosing to allot new land for flax includes a range of factors found on the commodity chain, from the idiosyncrasies of the crop to the value of the finished object. State officials, farm scientists, capitalist commodity producers, and the oilseed industrialists all had grand explanations for why flax appeared mostly on new breaking, but in reality farmers would only put flax on new, or any, land when a range of economic and environmental conditions were in place. It was never sown without promise of adequately high prices or in the absence of affordable seed and other inputs. When price allowed, it tended to appear on new breaking because it could be planted later and transported further without upsetting the balance of other activities and without learning many new techniques. Officials argued that flax was an agent of pioneer agriculture; to farmers, flax on new breaking was something so ordinary and routine it was rarely discussed, merely practiced.

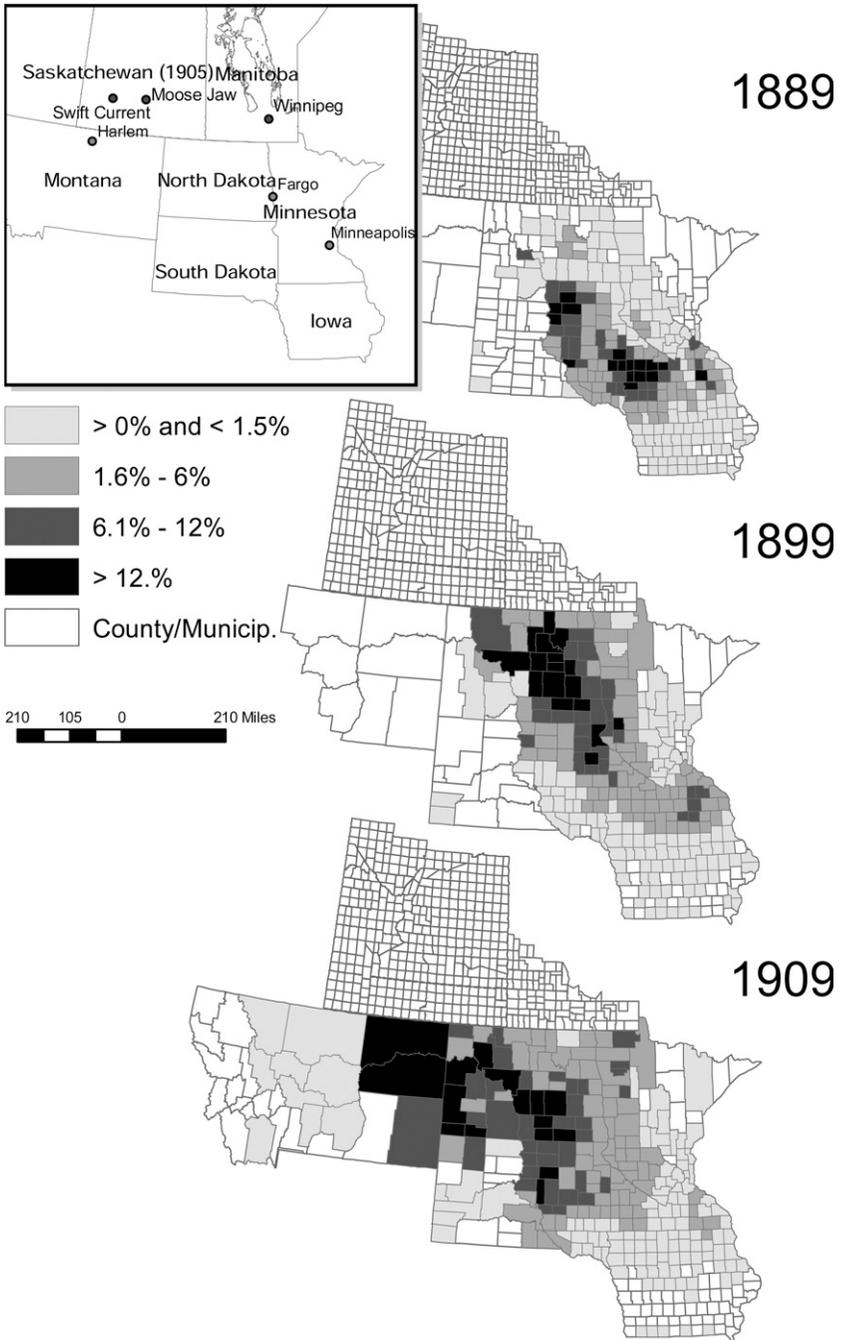
The salient features of the production chain were its temporal instability and geographic mobility. To the nation's top farm officials, mobility

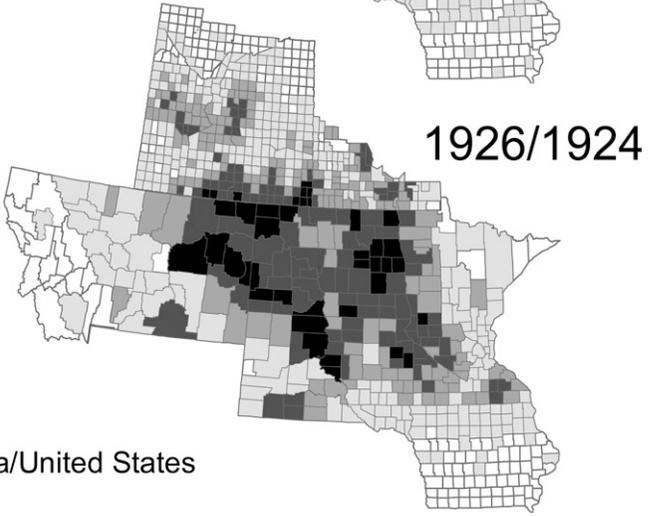
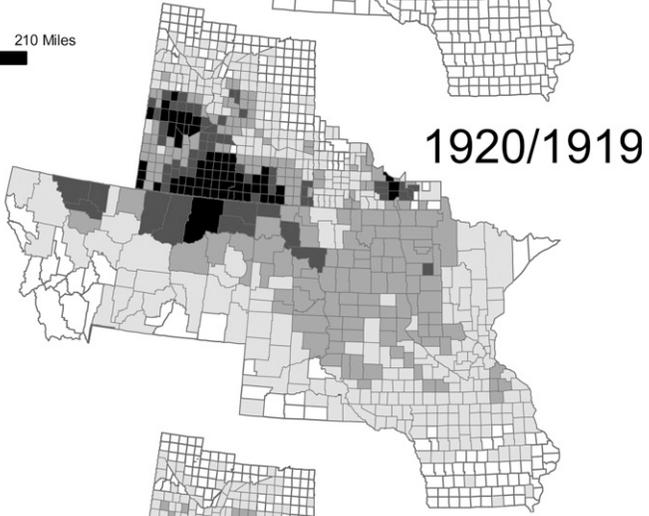
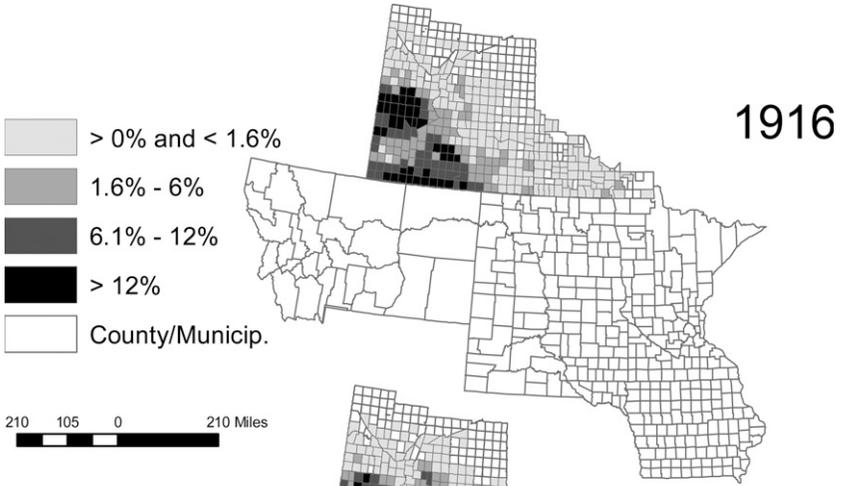
was symptomatic of flax's role as a sodbusting crop. State officials initially held that flax grown on freshly broken sod helped prepare the land for subsequent crops. The first suggestion that flax would become a breaking crop in the Canadian Prairies was in 1896, when William Saunders, the nation's most eminent farm scientist, claimed it grew well on first breaking in the northwest and also on fallowed land. He endorsed its role in the Prairie plow-up, claiming when "flax is sown on first breaking, a seed bed ... is provided, the farmer derives a revenue from his land the first year, and the crop effectually rots the sod so as to admit of ploughing to the ordinary depth in the autumn." State farm officials discussed flax's movements in the United States during the 1890s, and in 1902, the USDA claimed: "The flaxseed crop of the West has been distinctively a 'pioneer' crop ... [and] insofar as the reproduction of flaxseed is concerned, quickly exhaustive of the soil." The rhetoric intensified in later years. In 1907 an American farm scientist considered flax "valuable [for] subduing the virgin sod" and noted that "since the opening of the new lands in the West ... it has been a crop with which to reclaim the native sod."⁶

Officials based their theories not on experimentation, but on the pattern of flax production visible in aggregate census data. The center of flax production shifted several times between 1889 and 1930 in the northwest states, Manitoba, and Saskatchewan (see Figure 1). In fact, the nexus was never in the same place twice over any given quinquennial or decennial period before 1925. Beginning in Iowa, the location of farmers who chose to grow flax clearly moved northwest between 1889 and 1916. This was followed by a slight south-eastward movement in Saskatchewan until the Great Depression. Then Canadian flax virtually disappeared from production. In all of that period in Saskatchewan, farms that made flax a significant part of their field crops were usually in districts along the American border.

Despite its apparent presence as a frontier crop and Saunders's endorsement, flax did not suddenly become a major part of land settlement strategies in Canada. Land "reclamation" progressed quickly in Canada after 1900, but flax was virtually ignored by Canadian plains farmers until 1909, when the Saskatchewan Department of Agriculture noticed an increased interest in it. Then the Canadian flax crop, located almost entirely in the Prairie provinces, doubled its 1910 acreage to 1.4 million in 1911 and averaged about 1.1 million acres per year over the

Figure 1. Flax as Percentage of Field Crops.





Dates: Canada/United States

SOURCES: Canada, Dominion Bureau of Statistics, *Census of Canada 1921* (Ottawa: Dominion Bureau of Statistics, 1924); Canada, *Census of the Prairie Provinces, 1916* (Ottawa: J. de L. Tache, 1918); Canada, Dominion Bureau of Statistics, *Census of the Prairie Provinces* (Ottawa: Dominion Bureau of Statistics, 1926); US Census Office, *Eleventh Census, 1890* (Washington, DC: GPO, 1895); Census Office, *Twelfth Census, 1900* (Washington, DC: GPO, 1901); US Bureau of the Census, *Thirteenth Census, 1910* (Washington, DC: GPO, 1913); US Bureau of the Census, *Fourteenth Census, 1920* (Washington, DC: GPO, 1921); US Bureau of the Census, *Census of Agriculture, 1925* (Washington, DC: GPO, 1927); US Bureau of the Census, *Fifteenth Census, 1930* (Washington, DC: GPO, 1931).

next decade (see Table 1). The census of Canada attributed the unprecedented flax production to “the opening up of the Prairie provinces where flax has been sown to good advantage on new breaking.” Even as the federal report was being compiled, provincial officials were calling 1911 “a real flax year in Saskatchewan.” They connected it to the mass immigration of settlers from the western United States and the “consequent increase in new breaking.” American settlers were considered “desirable citizens” in many ways, especially because they arrived with dry-farming experience as well as animals, implements, furniture, and capital. Some were what Paul Voisey called “professional pioneers,” who had bought and improved successive frontier farms in many parts of the United States and Canada.⁷

Government officials saw a role for themselves in advising newcomers, as, like A. F. Mantle of the Saskatchewan Department of Agriculture, they feared that thousands of farmers were homesteading “with little or no knowledge of their work, the soil, the climate or those laws of nature and plant nature with which they must work in harmony.” “The first crop that most of these men will attempt to grow,” Mantle claimed, “is flax.” Farmers used it to “subdue new land” and for “reducing the soil to such a condition that it would grow wheat.” Perhaps even more important than its sodbusting strength was flax seed’s high price, and he recommended flax as a commodity that would provide homesteaders with much needed capital in their first years of Prairie farming. On the other hand, he wondered: “Is it worth the while of large companies and farmers having capital—men who need not sacrifice the future to immediate returns—to sow even clean flax seed upon their newly ploughed breaking?” Some claimed that the crop introduced noxious weeds and said that the soil became “flax-sick” or useless for growing flax in short rotations. Mantle warned that as a result, “the crop has become nomadic in character, constantly seeking new

Table 1. Flax Seed Production and Price, 1900–1931

Year	United States			Canada			
	Production, mil bu.	Price, \$ per bu.	Tariff, \$ per bu.	Production, mil bu.	Acres '000	Price, West, \$ per bu.	Acre Value, \$ per ac.
1900	16.0			0.2	23		
1901	27.6		0.25				
1902	36.1	1.05	0.25				
1903	25.4	0.82	0.25				
1904	22.6	0.99	0.25				
1905	28.7	0.84	0.25				
1906	27.6	1.01	0.25				
1907	23.8	0.96	0.25				
1908	20.6	1.18	0.25	1.5	139	1.07	11.50
1909	19.5	1.53	0.25	2.2	139	1.48	23.53
1910	11.4	2.31	0.25	4.2	582	2.17	15.86
1911	18.5	1.82	0.25	15.4	1,351	1.83	20.88
1912	28.1	1.29	0.25	26.1	2,022	1.05	13.57
1913	15.1	1.23	0.25	17.5	1,553	1.04	11.70
1914	12.9	1.31	0.20	7.2	1,084	1.14	7.57
1915	11.3	1.68	0.20	6.1	463	1.68	22.21
1916	11.9	2.31	0.20	8.3	658	2.41	30.20
1917	8.4	3.11	0.20	5.9	920	2.97	19.15
1918	12.8	3.58	0.20	6.1	1,068	3.24	18.37
1919	6.8	4.42	0.20	5.5	1,093	4.55	22.79
1920	10.9	2.33	0.20	8.0	1,428	2.07	11.60
1921	8.1	1.65	0.30	4.1	533	1.54	11.87
1922	10.5	2.08	0.40	5.0	566	1.95	17.21
1923	16.6	2.12	0.40	7.1	630	1.92	21.77
1924	31.2	2.18	0.40	9.7	1,277	2.28	17.32
1925	22.3	2.26	0.40	6.2	843	2.10	15.54
1926	18.5	2.03	0.40	6.0	738	1.74	14.14
1927	25.2	1.92	0.40	4.9	476	1.90	19.50
1928	19.1	1.94	0.40	3.6	378	2.02	19.31
1929	15.9	2.81	0.40	2.1	382	2.48	13.37
1930	21.7	1.61	0.65	5.1	582	1.14	9.93
1931	11.8	1.17	0.65	2.5	648	0.94	3.98

SOURCES: Eastman, *History of the Linseed Oil Industry*, 58; US Department of Commerce, *Statistical Abstract of the United States, 1920* (Washington, DC: GPO, 1921), 562. Figures in italics are wholesale prices from F. H. Leacy, *Historical Statistics of Canada*, M413-416, all other Canadian prices are for the western farmer as calculated by M. C. Urquhart, *Gross National Product, Canada, 1870–1926*, 157.

localities, and has been used almost exclusively as the first crop sown on virgin lands that were being brought under cultivation.”⁸

Various new settlers grew flax on the Prairies in different quantities. In 1911 a photograph of Joe Bellas’s homestead shack near Alderson, Alberta, showed that he grew a small plot of flax and that it ripened shortly after his wheat crop was harvested and stooked (see Figure 2). Judging from his house, he had not been on the land for very long and probably owned one or two quarter sections. The native short grass prairie in the foreground suggests that Bellas’s breaking strategy was to sow flax on the new land furthest from his home and adjacent to the property he planned to break next. The farmer’s flax land acted as a moving buffer between the unbroken prairie and his wheat or other crops.

Standing in stark contrast to Joe Bellas were several operators who grew flax on new land on a large scale. A photograph of the Canadian Wheatlands Company in 1912 or shortly thereafter shows a dozen horse-and-mule-drawn binders and ten pulled by a tractor, all harvesting an immense field of flax near Suffield, Alberta (see Figure 3). O. S. Longman’s first field work at this company included preparing an entire section for flax in 1912 that had been plowed the previous fall.

Figure 2. Bellas Homestead, Carlstadt (later Alderson), Alberta, 1911.



SOURCE: NA-4711-3, Glenbow Museum and Archives, Calgary, AB.

The disking and packing took the better part of three weeks. Repairs demanded additional time since the many exposed parts of the machinery were constantly coated in the dry prairie dust. In that same year Sir John Strutt grew flax on several sections of new breaking in Flaxcombe, near Kindersley, Saskatchewan. The niece of one of Strutt's one-hundred-person workforce recalled that the first "year's breaking was seeded to flax" and yielded "some 65,000 to 70,000 bushels."⁹

Around what became Nobleford, Alberta, Charles Noble sowed three thousand acres of crops on new breaking. Most of these acres were in flax in 1911 and 1912 and yielded a total of forty-eight thousand bushels of seed. "He was trying out new ideas," according to an excited local newspaper, "and at prevailing prices it does not take a savant to figure out what Mr. Noble is going to make on this year's operations." Noble had tried unsuccessfully to attract investors to his project and, after initial rejections, he wrote of his high yields to a friend in Edinburgh. "I am sure this would have been very interesting indeed," he gloated, "to those who might have joined in the purchase of this property." Noble continued to expand his holdings and sow flax on new breaking, even reporting a crop worth between one-third and one-half a million dollars in 1919. In this year of intensive sodbusting, wheat was only the second most valuable crop, worth between 67 and 80 percent of the value of flax.¹⁰

Figure 3. Cutting Flax on Canadian Wheatlands Fields.



SOURCE: NA-587-18, Glenbow Museum and Archives, Calgary, AB.

The increasing popularity of flax-growing in the far northern plains is evident in the maps of production from 1889 to 1919. In 1909 flax was important to farmers on the border of Montana and North Dakota. Several counties there devoted over 12 percent of their cropland to flax, and Billings County, North Dakota, grew flax on almost 25 percent of its field crop area. In 1916, 1919, and 1920, districts on the Saskatchewan–United States border devoted more of their cropland to flax than any other areas. The crop grew in both countries in similar quantities on the similar soils of the Canadian Prairie and northern Great Plains, which constrained it geographically in the same ways north and south of the border. Knowledge, producers, and practices traveled relatively freely across the international line, but it posed other significant restrictions. For example, both governments developed elaborate regulations to stop admittance of agricultural products thought to contain contagious diseases or pests and worked to quarantine suspect cases.¹¹

For a dozen years after 1910, flax growing followed strikingly similar trends in Canada and the United States. After the initial surge in 1911 and 1912, there was a period of low production and then an apparent increase at the end of the decade. Major flax growers such as Noble continued to cultivate it on newly broken land, and large American outfits did the same. The Campbell Farming Corporation in Montana broke and sowed seven thousand acres to flax and wheat in 1918. The company continued breaking ground rapidly in 1919 and presumably included flax in its sodbusting strategy. A USDA scientist claimed at the end of the decade that “fully 80 per cent of the [flax] crop was produced on breaking,” and, “in practically all the area lying west of the ninety-eighth meridian flax is grown as the first crop on breaking.” Although flax’s relationship to new breaking was never systematically examined, it was widely embraced.¹²

After 1920 Canadian and American flax production diverged. Canadians grew their third largest area in 1920, and then suddenly production dropped by almost two-thirds in 1921. Conversely, the northwest states experienced a major resurgence in production after 1922, and the map for 1924 indicates that most counties in North Dakota and a few in South Dakota and Montana devoted at least a tenth of their cropland to flax.

The turnaround in production trends represented the earliest days of the retreat from Palliser’s Triangle and the partial abandonment of the dry belt. Western Canadian rates of new breaking dropped sharply

between 1921 and 1926, especially in Saskatchewan and Alberta. Many of the farmers who had made flax a part of their entry strategy in southwest Saskatchewan in the 1910s had now either retreated from the semi-arid region or had ceased to bring new land into production.¹³

However, the 60 percent drop between 1920 and 1921 did not change the geography of Canadian flax growing significantly. Flax production never disappeared in the way that it left Iowa and the southern Red River counties before 1920. Most flax-growing in Saskatchewan took place in two semi-arid areas: one near Kindersley and the other forming a large triangle with a base stretched along the American border and a peak near Moose Jaw. These were the last truly uncultivated lands in southern Saskatchewan in the 1910s, and a prime location for sowing flax on new breaking. In the decade after 1915, many farmers in this region continued to plant the crop on new breaking, but at a substantially slower rate. Responding to lower market demand, it seems most farmers simply made flax a smaller proportion of their cropping. Farmers were evidently able to scale their investment and land use decisions. They were less constrained by the environmental idiosyncrasies of flax and were quite able to think on their feet and use their knowledge of prices, climate, and factor-availability to determine the best allocation of their resources.

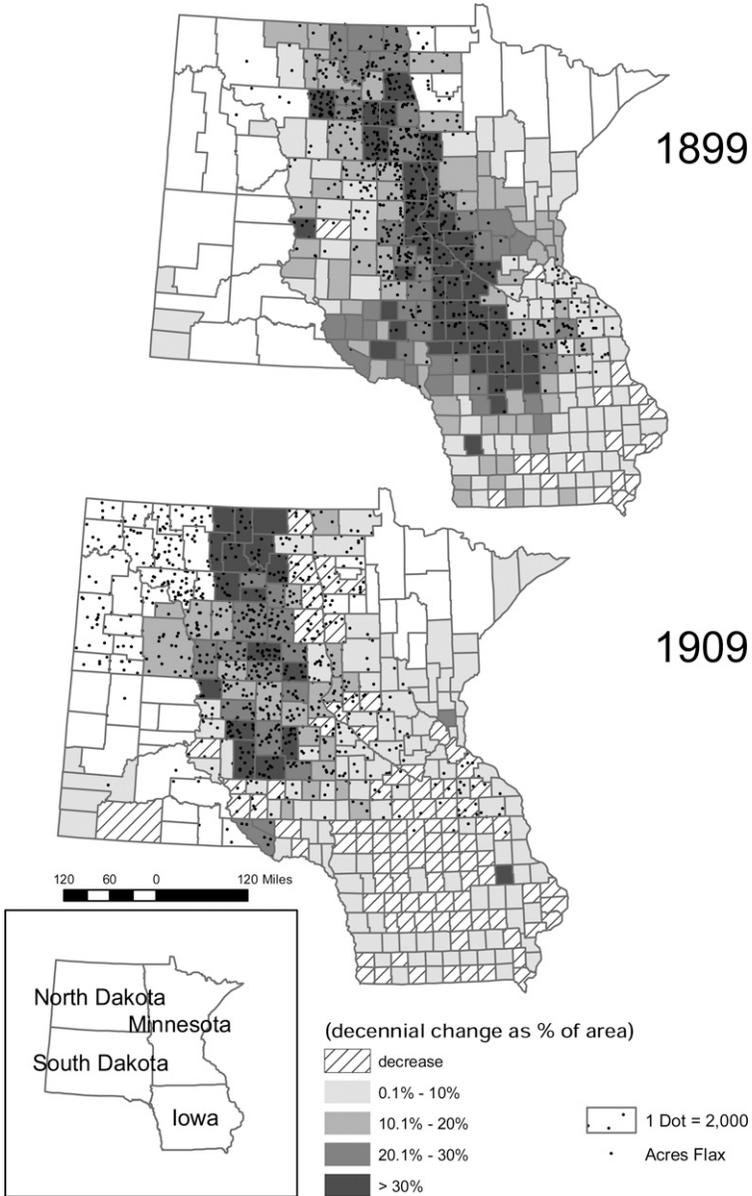
During the 1920s the center of flax production ceased to move northwest, and it seemed as if flax would return to the Great Plains. A rising price for seed and a tariff that favored domestic production briefly encouraged flax cultivation in the northwest United States. The tariff on imported flax seed since 1913 had been twenty cents per bushel, but, in peacetime, protectionists claimed that a dependency on foreign supply could mean disaster for the linseed oil industry if another war cut off the source of seed. This reasoning lay behind the Emergency Tariff of 1921, which increased the rate to thirty cents. The following year, the tariff was increased by another ten cents, and in 1930 a completely prohibitive tariff of sixty-five cents per bushel was introduced for imported flax seed. The effect of these policies on Canadian production was small. Canadian flax seed exports to the United States had continued despite the tariffs of the 1920s, and during the Great Depression both countries produced very little seed. The return of flax to the northwest states also indicated something of a "second frontier" opening in southwest North Dakota and Montana in the 1920s. This belt of counties with relatively high

proportions of cropland in flax was especially visible in 1924 and expanded into western South Dakota by 1929. Geoff Cunfer has shown that this area was probably quite recently plowed in 1920. It experienced a moderate increase in cultivation over the next fifteen years at which point the forbidding topography, temperature, and aridity “stopped sodbusters in their tracks.” Before these limits were reached, farmers employed flax as part of their sodbusting strategy. Yet flax had not been at all important here in 1919. Prior to the imposition of a protective tariff on flax seed, these farmers clearly grew other crops on their new land for some years.¹⁴

Other evidence shows that flax was not always an important sodbusting crop. Thousands of acres were improved across Saskatchewan every year without the help of flax cultivation. Other crops were seeded on new lands in the larger grasslands region. Charles Noble found that oats had a slightly higher value per acre than his flax, even in the first years of breaking. The *Farm and Ranch Review* claimed that wheat was the fastest way to make money “during ‘the early years of settlement.’” John Bracken demonstrated that wheat grown after flax yielded better than wheat grown after wheat, but not nearly as well as wheat grown after corn and other fodder crops. Don Worster originally argued that most new land under cultivation was sown to wheat, and Cunfer’s more detailed crop analysis suggests that corn was considered a breaking crop and followed a westward movement in the central plains similar to flax’s northwest migration.¹⁵

Still, flax had a distinctive relationship to newly broken land. Flax was another breaking crop—appearing in an area complementary to and north of the corn belt. Fortunately, data are available for comparing American flax production and the rates of grassland plowing during the first major increase in flax cultivation, from 1899 to 1909. In 1899 the first major crop of flax was recorded in the United States, which can be compared, on a county level, with the amount of new land plowed in the previous decade (see Figure 4). (For the sake of comparison, the breaking data for counties whose total area changed by more than two hundred square miles in that decade are excluded.) There is a clear correlation in this map between the areas of highest flax acreage and the areas with the most new land improved in the previous decade. By 1909 the crop was slightly more dispersed, and its center of production had shifted

Figure 4. Flax Acres Seeded (1899 and 1909) and Change in Improved Acreage as a Percentage of Total County Area (1889–1899 and 1899–1909).



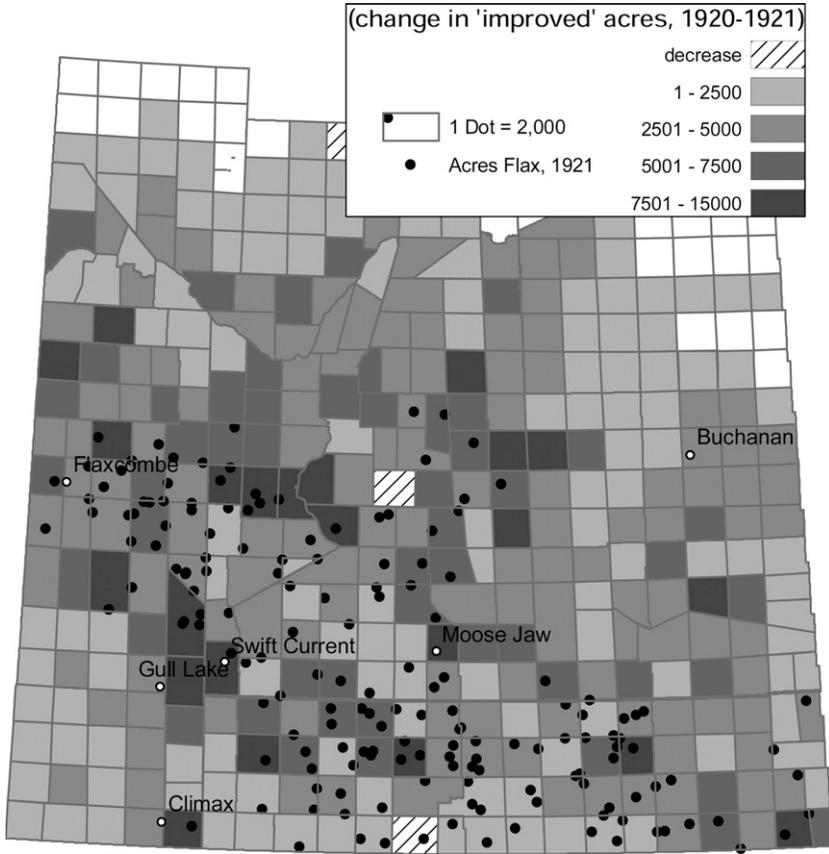
SOURCES: US Census Office, *Eleventh Census, 1890*; US Census Office, *Twelfth Census, 1900*; US Bureau of the Census, *Thirteenth Census, 1910*.

westward again throughout North and South Dakota (see Figure 4). Its movement followed another shift—the frontier of land under improvement. (Again, land use data are not displayed for counties whose boundaries changed to any great degree, but extrapolating from the trends in these two maps suggests that the areas in north central North Dakota were also undergoing significant breaking.)¹⁶

In Canada, the absence of crop data for standard census districts before 1916 precludes a study of the relationship between flax farming and breaking in the peak years of either activity. However, early records suggest that flax was most popular in the areas undergoing the most new breaking. Qu'Appelle, the Saskatchewan district with the most new land improved between 1905 and 1906 was by far the nation's largest producer of flax seed. In fact, 3.3 percent of the district's cropland was in flax in 1905 and almost twice that percentage was flax acreage in 1906. Between 1920 and 1921, however, data on which rural municipalities in Saskatchewan improved the most land are available and can be compared with flax production in 1921 (see Figure 5). Many areas, especially in the northern half of the map, experienced significant breaking, quite apart from any serious flax production but, in the areas where flax was grown, there was a potential relationship to the areas of most intensive sodbusting. Saskatchewan's rural municipalities did not reflect a perfect ratio of one acre of flax for every acre of new land. By far the most municipalities reporting any flax at all reported small amounts and were home to more recently improved acres than acres of flax. Nevertheless, these data suggest that whereas flax was not a critical part of sodbusting, new breaking was a fundamental part of growing flax.¹⁷

The commodity chain's experts had several explanations for why farmers grew flax on new land and seemed unable to grow it on old land. Flax's impact on the soil was often discussed—especially as Prairie farmers grew it in unprecedented quantities—and these discussions shed light on how farmers, promoters, and scientists thought of the environment. When state officials observed flax seed production moving between states they were less concerned with where flax moved than with where it disappeared. All the major cereals appeared in newly settled areas, but unlike flax they continued to be grown. So, flax was not necessarily a crop good on new land as much as it was a crop that grew poorly on land previously cropped to flax. Flax's constant relocation convinced

Figure 5. Flax Acres Seeded (1921) and Change in Improved Acreage in South Saskatchewan (1920–1921).



SOURCE: Canada, Dominion Bureau of Statistics, *Census of Canada 1921* (Ottawa: Dominion Bureau of Statistics, 1924).

scientists that it was detrimental to the land and could only be grown once or twice before it exhausted the soil of the essential elements needed for its cultivation.

The problem with the supposed threat of soil exhaustion is that farmers around the world learned how to farm soils for centuries without “exhausting” them. In particular, Russia, Northern Ireland, and the Baltic countries all farmed flax extensively for long periods. Bracken realized this and claimed “It should be possible for us to do what older agricultural countries have done, viz., conserve our soil resources while

still developing them.” Conversely, flax was far from a prerequisite crop on new breaking. There is no evidence that it was used on new soil in geographically similar areas such as northern Alberta’s Peace River district, the Soviet Virgin Land Program, or anywhere outside of the northern Great Plains and Prairies. But in that one place and in a relatively short period of new breaking, flax production soared and a discourse formed around flax’s role on pioneer farms.¹⁸

Farmers must have had other reasons both for growing flax, apart from soil preparation or cultural preference, and for not growing it, apart from soil exhaustion. The more likely explanations for flax’s odd geography are found in the spatial patterns of grassland resettlement and the political economy of the flax-paint commodity chain. The production chain’s output—seed—had a new and growing market, as demand for linseed oil in the paint and varnish industries created high prices that coincided with periods of grassland settlement. Transporting this output from newly broken land distant from railways or across international borders was possible with this low bulk and high value commodity. The major input necessary for flax production—land free of flax diseases and generic weeds—was plentiful on the edges of settlement. The crop performed well on rough breaking, which was often the only kind accomplished by new settlers, and had a season short enough to allow planting directly after spring breaking.

One of the reasons flax was grown at all in an agricultural economy generally known for wheat monoculture, was because it required few additional capital inputs. Almost anything a farmer invested in to grow flax could be used later or sometimes even in the same season for cultivating other grains. Flax farming occasionally demanded granaries for long-term crop storage or leak-proof wagons for hauling, but these were rather general improvements that a farmer could justify even if he or she never intended to grow flax again. The only investment a farmer was unlikely to use after flax was a special binder attachment that facilitated mechanical harvesting. Flax straw is much stronger than the straw on cereals, but even so most regular equipment would harvest it under careful operation. Many farmers grew such small amounts of flax that they could harvest their crops without the more efficient modifications.

When Mantle encouraged flax as an early cash crop for small farmers it was probably because of reports such as this one from the *Lakota*

Herald. A North Dakotan farmer in Walsh County, it claimed, “raised 2,500 bushels of flax from 100 acres of a \$750 farm, and is still selling it at home for \$1.75 per bushel for seed. A \$4,375 crop off a \$750 farm is pretty swift farming.” The yield this farmer reported in 1900 was over twice the previous year’s national average and seems unlikely. However, Walsh County was one of several important flax-producing districts in the Red River Valley, and its flax farmers averaged over fifteen bushels per acre in 1899. At that rate, the farmer would still have earned \$2,625 for his crop.¹⁹

In 1910, at the cusp of the first major flax boom in Canada, the Saskatchewan Department of Agriculture claimed that its farmers were earning similar prices. Well over a dozen correspondents writing to the department to account for the increase in various crops, mentioned that farmers grew flax because the high price made it worthwhile. Others gave additional reasons, such as its low bulk, profitability for distant transport, and the low price of other commodities such as oats. Farmers reported an increase in flax in many areas and for several reasons—mainly its price.²⁰

Farmers took a whole range of factors into consideration when deciding to grow flax, but the previous year’s prices were good indicators. Regular data collecting on annual flax acreage and prices in Canada began in 1908. An examination of three decades of these data shows that there is a positive correlation between the price of flax in one year and the area of land seeded to flax in the next. However, the market for flax seed was unpredictable; whereas \$1.50 was the median price per bushel between 1908 and 1938, farmers earned over \$2.00 in 1910 and 1929 and saw prices climb from \$1.00 to \$4.13 between 1914 and 1919. The Canadian linseed oil industry could only use a small amount of the country’s seed. In a letter to A. F. Mantle in 1910, Thomas Thompson, an influential grain merchant in Winnipeg, estimated that the domestic market for flax seed would never demand more than a million bushels. He was probably aware that Canada produced just over two million bushels the year before, but in a matter of two years its production increased to twenty-six million bushels of seed. The majority of these harvests were marketed in Great Britain and the United States, but these countries could also buy from competing flax seed producers in Argentina, India, and Russia.²¹

Along the Canadian–United States border, where Saskatchewan dry belt farmers often seeded over a quarter of their cropland to flax,

the oilseed was hauled to American elevators—apparently without interference from customs officials. Climax-area farmers like Bud English, hauled the short distance to Harlem, Montana, not just for flax markets but for a variety of services and destinations. Emil Kluzak hauled flax to Harlem in 1912, starting from Gull Lake, a depot on the Canadian Pacific Railway's main (and only nearby) line. "There were no customs on the border then," Emil claimed, "and people went back and forth as they pleased. We hauled about 65 bushels on each team. Flax was worth from 95c to \$1.00 a bushel, but you could buy a whole load of groceries for a load of flax."²²

Many farmers along the international border homesteaded in Canada but lived, worked, and sold, to some extent in the United States. Flax farming fit the social and economic situation of these cross-border farmers well. The commodity was ideal for hauling longer distances, and the loose border controls meant that it could be brought to the best market at either side. The land on the Canadian side was uncultivated and free of the weeds and diseases that plagued the crop. Farming it required few inputs or skills unfamiliar to northwest farmers and, by taking free homesteads and seeding them to flax, these farmers were investing in a promising product—land. Any inputs they put toward flax farming added value to their investment. Seed, implements, and other settlers' effects were available in familiar contexts and hauling flax to American markets was easily combined with family visits or short-term work trips.

Those who grew flax on new land found that ideal conditions included a suitable market for their seed, access to breaking outfits, and early, dry spring weather. In the *Lakota Herald* of June 12th, 1903, a farmer in Nelson, North Dakota, claimed good weather "made it possible to do much breaking and ... much flax has been sown on the new breaking." In the spring of 1910, the Saskatchewan Department of Agriculture offered some explanations for the increased amount of flax it observed under cultivation that year. The early spring allowed more land to be broken and sown in the same season, and flax was the crop of choice for such a quick use of new land. Another early spring in 1911 meant that "new settlers continued breaking until late" and planting the land to flax in the "new districts" along the Canadian Pacific Railway. These farmers gambled with nature by seeding late and were struck by misfortune when early snows caught and ruined their standing flax. However, the flax crop continued to increase,

“especially in newly opened districts,” and the department began to encourage a flax-breaking rotation. It recommended seeding new land to flax, followed by wheat, hay, another cereal, and then flax again.²³

Shipping and time constraints meant that most flax growers had to secure seed and break land before anyone knew when the land would dry, but good weather and the fact that flax was the last grain seeded may have given them more flexibility and enough time to order seed. One linseed oil consumer distributed literature to Canadian farmers as late as May 25th, because it was assured “there is yet time for considerable planting of flax, and the bulletins may do good.” One possible solution for last minute flax production may have been breaking outfits. John Bracken described a tractor outfit that plowed, disked, seeded, and harrowed flax in a single operation, but this was presumably not affordable to ordinary homesteaders. In four of Saskatchewan’s nine crop districts, provincial correspondents reported gas- and steam-powered outfits breaking land and sowing it to flax. In Buchanan, Saskatchewan, a correspondent to the department of agriculture reported seven such outfits breaking flax land in his township. “As near I can tell there were 640 acres broken this last week for flax,” he wrote on May 8th. O. S. Longman, then a student at Manitoba Agricultural College, worked on a steam-plowing outfit that could break an entire section of Alberta prairie in less than a week.²⁴

The argument that flax yielded better than other crops on new land may also explain why farmers grew flax when prices made it worthwhile. In 1916 J. Grisdale of the Canadian Department of Agriculture argued that flax was suitable for the settler because it outperformed other crops on new land. Americans such as Barker expressed similar optimism. In his opinion, flax was “the only grain which can be grown to full yield the first season on land ploughed and planted in the spring. Many farming lands have been paid for with the flaxseed crop obtained from the first breaking of the soil.” Consequently, “the bulk of the flaxseed crop has been produced by the frontier farmer.” According to Cora Hind, a leading Prairie agricultural columnist, “By far the safest crop for the beginner or on freshly broken land is oats, or flax put in in the spring on ground broken the previous summer,” but many experts, including Hind, were reluctant to endorse flax in Canada for reasons ranging from weed control and market instability to soil exhaustion.²⁵

These incentives for flax production do not necessarily explain why flax was often abandoned when new breaking ceased. Farmers on established farms found that whenever the spread of acre values between flax and other crops was very narrow, the risks of growing flax quickly outweighed the incentives. One of the major risks was a disease known as flax wilt. When established farmers abandoned flax they often considered their land “flax-sick,” and some North Dakotan neologists even claimed their land had been “flaxed to death.” At the turn of the twentieth century, H. L. Bolley, a plant pathologist at the North Dakota Agricultural College, discovered that the reason land became “flax-sick” was not from soil exhaustion but from a fungus deposited by the plant itself. When the crop was grown in a short rotation it became prone to disease, especially one known as *Fusarium lini*, or flax wilt. In 1911, when the United States’s flax crops were mostly concentrated in the Dakotas, Mantle claimed flax wilt was the real cause of “the disappearance of flax as a general crop in all but a few of the north-western states.”²⁶

The yield pattern lends veracity to the predictions of plant pathologists who claimed that intensive, repeated flax cultivation would encourage flax diseases and cripple the crop’s yield. Like most crops in the nitrogen-starved prairie, flax yields per acre declined steadily. What made the oilseed different was that areas of intensive production, such as the Red River counties, tended to drop more dramatically in yield per acre by the next census year. Conversely, the less American farmers planted flax in 1924, the more their yields went up in 1929.²⁷

Bolley found that by treating the seed the spores of the fungus could be destroyed, and he grew flax continually in a diseased plot at the state experiment station in order to select and breed more wilt resistant strains. He enlisted the help of flax industrialists and farmers alike in an effort to “save the flax crop,” but the general seed production levels declined in the first two decades of their work. The acre value of flax compared closely with other crops, and the cost of Bolley’s treatments and special seed varieties all counted against it. The American crop may have been revived in the 1920s, but this was temporary and at least partly due to protective tariffs. If tariffs made flax more valuable to American farmers, the efforts of scientists like Bolley helped account for the eastward movement of flax to older areas. The peculiar mobility that relocated the North American flax crop every year until at least 1916 was curtailed, partly by

the boundaries of arable land and partly by a new political economy. The scientific triumph over infected soil had limited effect; ultimately the inputs in flax's commodity chain favored new land and demanded a consistent price for its outputs.²⁸

Thus, flax presents a new glimpse of the Prairie plow-up, suggesting that when prices were encouraging, farmers planted the crop in some parts of the northern Great Plains for quick and effective use of newly broken land. It is unlikely that the economic allure of flax induced many farmers to break new land to accommodate it and even more unlikely that farmers believed flax would help prepare their new soils for other cropping. However, when for a variety of reasons farmers chose to grow flax they grew it in areas with more new land under the plow. The main factor influencing farmers' decisions to grow flax was its price and the acre value spread between it and other crops. A secondary factor was flax's suitability to their businesses, or the way flax's commodity chain fit with their available inputs. Without a high enough price as incentive, no amount of appropriate land could entice farmers to grow flax. There were many uncertainties in these two factors. Flax seed prices were even less predictable than the major cereals, and the most fertile flax land required certain growing conditions to secure a good yield. Diversifying production helped minimize risks, but it was only possible if the spread between commodity prices was relatively narrow. In certain years and places the acre value of flax seed came close to wheat and oats and this coincided with a period of rapid settlement and available breaking on which to sow flax.²⁹

Flax was not the critical factor in sodbusting, rather, its growing importance in a period of major settlement and rising demand for linseed oil meant that Prairie people thought of new ways to make flax work in their businesses and their environment. A new thirst for color and the political economy of the paint and varnish industries determined when flax was grown and the cost of exporting it to the United States. Within national boundaries and during years of high prices, the environment and the land use practices of farmers encouraged flax in the northern Great Plains and semi-arid Prairie. The environmental constraints within this region were overcome by a variety of technological improvements, so long as they were affordable, such as dry-farming and early maturing varieties. Crop diseases were especially crippling for flax yields, and although disease-resistant varieties were developed, the most effective adaptation

was long crop rotations or moving production to land that had never been in flax. The changing environment and economy of the flax boom meant that innovations were necessary to find the best areas for flax and the best botanical strains for those areas. Flax did not create the agricultural prairie landscape, but the people who did often grew flax on new breaking. Many recent commodity histories write about how salt, potatoes, corn, and so on changed the world. The story of prairie flax is, by contrast, about how society changed and refashioned commodity chains.

NOTES

1. M. C. Urquhart shows that from 1909 to 1923 flax was the third most valuable grain, after wheat and oats, except for 1911 and 1912 when it was second only to wheat, and 1921 when it dropped briefly below barley, *Gross National Product, Canada, 1870–1926: The Derivation of the Estimates* (Kingston: McGill-Queen's University Press, 1993), Table 1.9, 32–33; Canada, Dominion Bureau of Statistics, *Census of the Prairie Provinces*, 1916 (Ottawa: J. de L. Tache, 1918), Table 38, li.

2. Research for this paper has been supported in part by the Canada Research Chair in Rural History, University of Guelph. I am also grateful for the United States spatial data provided by HUSCO, the United States Agricultural Census data obtained through the Great Plains Population and Environment Database, and the advice of *Agricultural History's* anonymous reviewers.

3. W. A. Waiser, *The Field Naturalist: John Macoun, The Geological Survey, and Natural Science* (Toronto: University of Toronto Press, 1989), 49–50; Doug Owrarn, *Promise of Eden: The Canadian Expansionist Movement and the Idea of the West, 1856–1900* (Toronto: University of Toronto Press, 1980), 111. This notion was popularized earlier in the United States by Charles Dana Wilbur, see, Donald Worster, *Dust Bowl: The Southern Plains in the 1930s* (New York: Oxford University Press, 1979), 82.

4. Ann Marie Low, *Dust Bowl Diary* (Lincoln: University of Nebraska Press, 1984), 29. The use value of linseed meal for livestock feed was high but presumably unavailable to farmers until after the flax seed had been milled. Therefore, flax cannot be considered a feed crop in the same way as oats and corn, and its proximity to livestock does not carry the same weight. Ruby Delores (Stanek) Arsenault, "The Frank Staneks," in *Our Czech Heritage*, ed. Verla Nevay (Rosetown, SK: V. Nevay, 1980), 53.

5. See, for example, Michael Percy and Tamara Woroby, "The Determinants of American Migration by State to the Canadian Prairies: 1899 and 1909," *University of British Columbia Economics Discussion Paper No. 79-02* (Jan. 1979); Jeffrey B. Roet, "Agricultural Settlement on the Dry Farming Frontier, 1900–1920" (PhD diss., Northwestern University, 1982); Owrarn, *Promise of Eden*; David Spector, *Agriculture on the Prairies, 1870–1940* (Ottawa: National Historic Parks, 1983); Clinton Lorne Evans, *The War on Weeds in the Prairie West: An Environmental History* (Calgary: University of Calgary Press, 2002), 86. Peter A. Russell's recent synthesis challenges the simple picture of Canadian grassland farmers importing technologies such as dry farming from a supposedly homogenous area like the northwest states, "The Far-From-Dry Debates: Dry Farming on the Canadian Prairies and the American Great Plains," *Agricultural History* 81 (Fall 2007): 493–521.

6. Early growers in the east claimed “nothing can beat a piece of old lea” for growing flax, but otherwise there is little evidence that it was considered a sodbusting crop before the 1890s, J. A. Donaldson, “Flax Culture,” *Canada (Toronto) Farmer*, Apr. 15, 1869; William Leslie, “Flax in and about Meadowvale,” *Canada Farmer*, July 1, 1865, 195; William Saunders, “Flax,” Central Experimental Farm, Ottawa, *Bulletin No. 25* (May 1896), 7; Charles M. Daugherty, “Flaxseed Production, Commerce, and Manufacture in the United States,” *Yearbook of the United States Department of Agriculture, 1902* (Washington, DC: GPO, 1903), 421–38, 425; C. P. Bull, “Flax,” in *Cyclopedia of American Agriculture*, Vol. II, ed. L. H. Bailey (New York: Macmillan Company, 1907), 294, 295.

7. F. Hedley Auld, “Acreage of Grain Crops and Condition of Livestock,” Saskatchewan, Department of Agriculture, *Bulletin No. 10* (July 2, 1909): 4; A. F. Mantle, “Acreage of Grain Crops and Condition of Livestock,” Saskatchewan, Department of Agriculture, *Bulletin No. 16* (May 27, 1910): 4; Canada, Dominion Bureau of Statistics, *Census of Canada* (Ottawa: J. de L. Tache, 1914), xlvii; Thomas Cromie, “Estimated Acreage of Grain Crops and Report on Condition of Live Stock,” Saskatchewan, Department of Agriculture, *Bulletin No. 26* (June 30, 1911): 21, 5–7; Don C. McGowan, *The Green and Growing Years: Swift Current, 1907–1914* (Victoria: Cactus Press, 1982), 21; Paul Voisey, *Vulcan: The Making of a Prairie Community* (Toronto: University of Toronto Press, 1988), 46–47.

8. A. F. Mantle, “Hints for Flax Growers,” Saskatchewan, Department of Agriculture, *Bulletin No. 24* (1911): 4, 9, 5.

9. Oliver S. Longman, “Pioneers and Pioneering in Western Canada,” 1963, MS, Glenbow Museum and Archives, Calgary, AB (hereafter GMA), pp. 76, 82; Harvey White, “The Big Four Farm” and Verna Sawchuck, “Pleasant Memories of the Big Four—1912–1914,” in *Little Town in the Valley: History of Flaxcombe and Surrounding School Districts* (Flaxcombe: Historical Society, 1984), 32, 36.

10. “Charles S. Noble,” *Lethbridge (Alberta) Herald*, Oct. 21, 1912; C. S. Noble to Alfred Shepherd, Oct. 18, 1912, GMA; the estimates were typed in the spring before planting and were modified in pencil, presumably in the fall, to indicate that more flax had been sown in the newest property and that higher yields made the crop worth \$463,500, C. S. Noble Fonds, “Estimated Crop & Revenue,” May 17, 1919, GMA.

11. Paul Riegbert, *From Arsenic to DDT: A History of Entomology in Western Canada* (Toronto: University of Toronto Press, 1980), 95–97; Anatoly Marchenkov, et al., “Cultivation of Flax,” in *Flax: The Genus Linum*, ed. Alister D. Muir and Neil D. Westcott (London: Routledge, 2003), 76–77.

12. Deborah Fitzgerald, *Every Farm a Factory: The Industrial Ideal in American Agriculture* (New Haven: Yale University Press, 2003), 151; Charles H. Clark, “Experiments with Flax on Breaking,” Bureau of Plant Industry, USDA, *Bulletin No. 883* (Sept. 20, 1920): 2–3, he is presumably referring to flax in the northern Great Plains, or what he calls “the four principal flax-producing States” (ND, Mont., Minn., and SD).

13. David B. Danbom, *Born in the Country: A History of Rural America* (1995; repr., Baltimore: Johns Hopkins University Press, 2006), 187–88; David C. Jones, *Empire of Dust: Settling and Abandoning the Prairie Dry Belt* (Edmonton: University of Alberta Press, 1987).

14. Whitney Eastman, *History of the Linseed Oil Industry in the United States* (Minneapolis: T. S. Denison & Co., 1968), 174–76; Geoff Cunfer, *On the Great Plains: Agriculture and Environment* (College Station: Texas A&M University Press, 2005), 30–31, 35–36.

15. Noble to Shepherd, Oct. 18, 1912, quoted in Voisey, *Vulcan*, 85; Mantle, “Hints for Flax Growers,” 9–10; John Bracken, “The Problem of Crop Production,” Saskatchewan,

Department of Agriculture, *Bulletin No. 48* (1917): 6–13; Worster, *Dust Bowl*, 94; Cunfer, *On The Great Plains*, 89–92.

16. Production surged up 75 percent in certain years in this decade, but given the lack of county-level data for those years the decennial census is as close as we can get to the question of flax and sodbing.

17. There are several complicating factors with the acreage of new land under improvement. The category does not necessarily indicate that all land under improvement was plowed. In Canada it included land in field crops as well as idle land, fallow land, and land in pasture. In the United States, discrepancies between the questions enumerators asked about improved land in 1910 and 1920 meant that more pasture was probably included in the latter year's data. Fortunately, earlier data are more comparable in the United States, and excellent records for the Prairie provinces in the 1920s enable research in that decade. Specific to the flax issue, the crop may have been more attractive to sow on land that had been broken in the spring of that growing season than on new land that had been broken the previous summer. The census does not allow us to differentiate between the two, and we are left to examine more anecdotal evidence, Canada, Department of Agriculture, *Census of Population and Agriculture of the Northwest Provinces: Manitoba, Saskatchewan, Alberta, 1906* (Ottawa: S. E. Dawson, 1907).

18. Bracken, "The Problem of Crop Production," 8.

19. *Lakota (ND) Herald*, Mar. 30, 1900.

20. Mantle, "Acreage of Grain Crops and Condition of Livestock," 8–12.

21. F. H. Leacy, ed., *Historical Statistics of Canada* (Ottawa: Statistics Canada, 1983), Table M249-300; Thomas Thompson to A. F. Mantle, in Mantle, "Hints for Flax Growers," 14.

22. Stone Diggers Historical Society, *Prairie Wool: A History of Climax and Surrounding School Districts* (Climax: Stone Diggers Historical Society, 1980), 98, 235.

23. *Lakota Herald*, June 12, 1903; A. F. Mantle, "Acreage of Grain Crops and Condition of Livestock," 4, 9–10; Thomas Cromie, "Final Report on Grain Crops and Live Stock of the Province of Saskatchewan for 1911," Saskatchewan, Department of Agriculture, *Bulletin No. 29* (Feb. 12, 1912): 24; Thomas Cromie, "Final Report on Grain Crops and Live Stock of the Province of Saskatchewan for 1912," Saskatchewan, Department of Agriculture, *Bulletin No. 35* (Feb. 1913): 9, 70.

24. H. L. Bolley, North Dakota Agricultural Experiment Station, to Manager, American Linseed Oil Company, May 25, 1918, File 7, Box 39, Henry Luke Bolley Papers, Institute for Regional Studies & University Archives, North Dakota State University, Fargo, ND (hereafter HLB); John Bracken, *Crop Production in Western Canada* (Winnipeg: Grain Growers Guide, 1920), 214; A. F. Mantle, "Acreage of Grain Crops and Condition of Live Stock," 9; Longman, "Pioneers and Pioneering in Western Canada," 82–83.

25. *Drumheller (AB) Mail*, Apr. 13, 1916; Walter S. Barker, "Flax: The Fiber and Seed: A Study in Agricultural Contrasts," *Quarterly Journal of Economics* 3 (May 1917): 500–29; Edmund A. Whitman, *Flax Culture: An Outline of the History and Present Condition of the Flax Industry in the United States and a Consideration of the Influence Exerted on it by Legislation* (Boston: Rand Avery Company, 1888). J. R. Leeson's introduction claimed it "is stated in a recent official document that 'in many instances a single crop (of seed) has paid for the land, in addition to the cost of breaking and planting,'" 11.

Cora Hind, "Farm Problems," *Canadian Thresherman and Farmer* (Feb. 1919): 36; Mantle actually claimed in a letter to Thomas Thompson that he would "not undertake to advise [farmers] to grow more flax." A. F. Mantle to Thomas Thompson, Dec. 3, 1910, File 1, No. 38,

Ag. 3, Saskatchewan Archives, Saskatoon, SK (hereafter SA), p. 1. In an undated summary of scientist McKay's presentation at a convention, he stated that "if the government could stop the growing of flax in this country it would be a good thing—from the point of view of weed prevention," File 1, No. 38, Ag. 3, SA, p. 3.

26. "Letters from farmers regarding co-operative and extension work conducted by the Department of Botany, 1911–1914," File 18, Box 13, HLB; David B. Danbom, *Our Purpose is to Serve: The First Century of the North Dakota Agricultural Experiment Station* (Fargo: North Dakota Institute for Regional Studies, 1990); H. L. Bolley, "Growing Flax on Old Lands," North Dakota Agricultural Experiment Station, *Bulletin No. 40* (Dec. 1910): 1; Cromie, "Estimated Acreage of Grain Crops and Report on Condition of Live Stock," 35, 69.

27. W. Burton Hurd and T. W. Grindley, *Agriculture, Climate and Population of the Prairie Provinces of Canada: A Statistical Atlas Showing Past Development and Present Conditions* (Ottawa: F. A. Acland, Printer to the King, 1931), 41; Cunfer, *On the Great Plains*, 206–207.

28. H. L. Bolley, "Resistant Flaxseed for Sowing Purposes," North Dakota Agricultural Experiment Station, *Bulletin No. 57* (Jan. 1, 1913): 1–4; Eastman, *History of the Linseed Oil Industry*, 105.

29. Bolley believed during the First World War that, unless war stopped, the "spread" between flax and wheat prices would not narrow, and he should not promote flax when wheat prices were high. He figured he would be accused of trying to increase seed production in order to lower prices, H. L. Bolley to Archer-Daniels Linseed, Apr. 8, 1915, File 11, Box 39, HLB.