

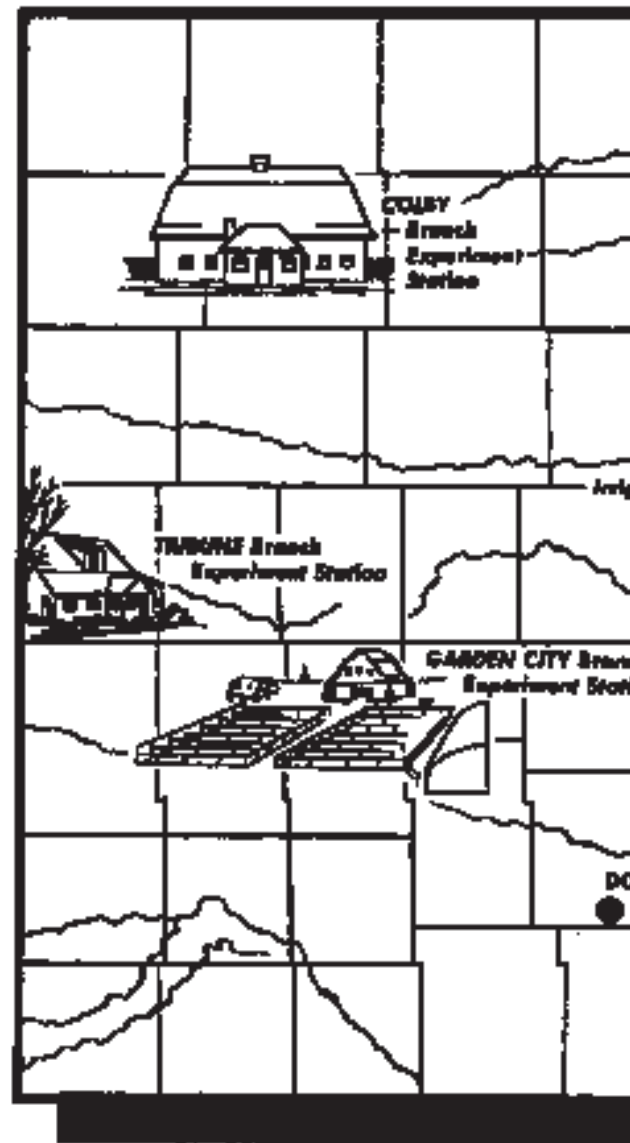
# Beyond Winter Wheat

## The USDA Extension Service and Kansas Wheat Production in the Twentieth Century

by Bonnie Lynn-Sherow

James Malin's celebrated study of farmers' adaptation to a "subhumid" climate, *Winter Wheat in the Golden Belt of Kansas* (1944), often has been hailed by scholars as a masterpiece of early environmental history.<sup>1</sup> His expansive view of humankind in the environment raised the study of history and ecology to unprecedented levels of detail and abstraction. But Malin was first and foremost an agricultural historian. His subjects were farmers and his venue was the Dust Bowl. Certainly Malin's intense pride as a native Kansan caused him to study the farmers of Edwards County, but celebration was not his primary objective. Malin's insistence on Kansas farmers' successful adaptation to the grasslands in *Winter Wheat* also was a reaction against what he considered the totalitarianism of federal agricultural planning, specifically the Agricultural Adjustment and Resettlement Administrations.<sup>2</sup> Malin's rejection of

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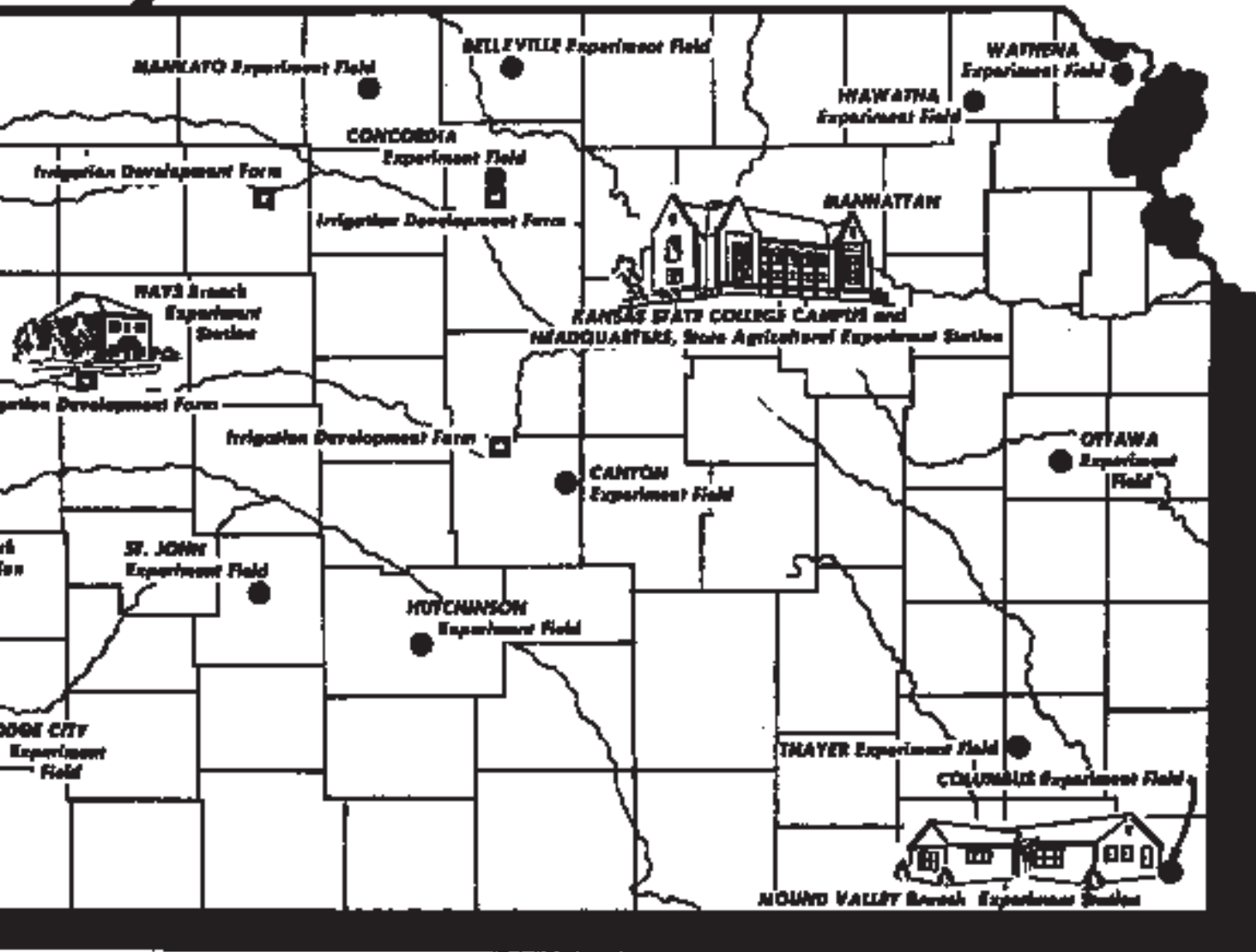
Map is from the Kansas State College of Agriculture Experiment Station Bulletin for June 1955.

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1. See particularly, Allan G. Bogue, "The Heirs of James C. Malin: Grassland Historiography," *Great Plains Quarterly* 1 (Spring 1981): 105-31; Burton J. Williams, "A Dedication to the Memory of James C. Malin, 1893-1979," *Arizona and the West* 22 (Autumn 1980): 206-10; Robert P. Sweirenga, "The Malin Thesis of Grassland Acculturation and the New Rural History," *Canadian Papers in Rural History* 54 (1985): 297-335.

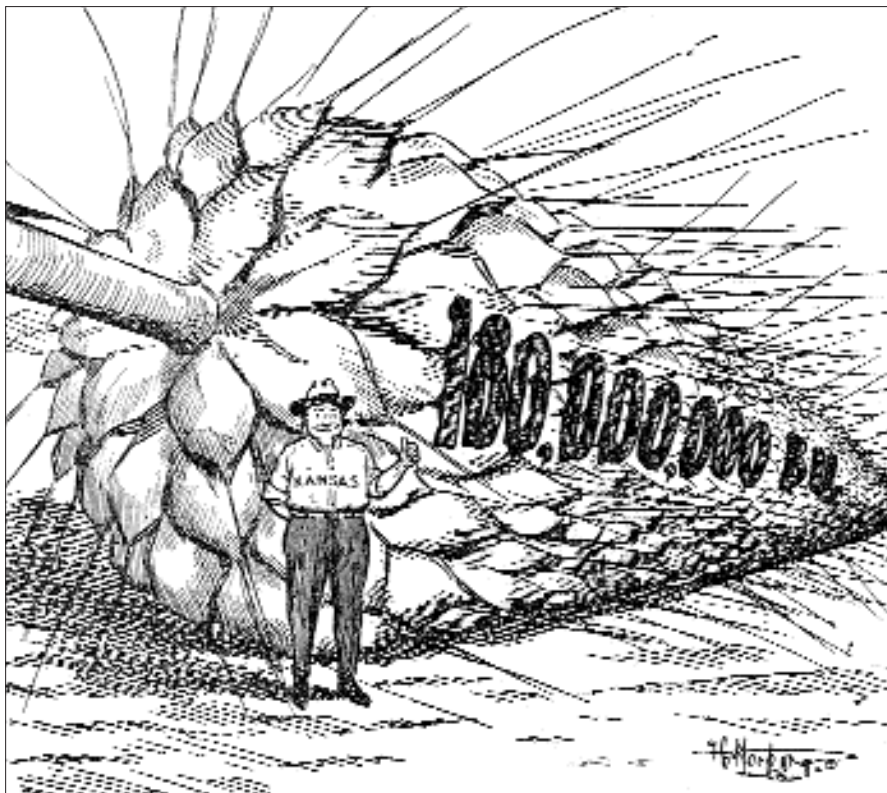
2. Richard White has noted that, "Hostile to social and environmental planning, Malin has become the unlikely progenitor of a group of scholars identified with the environmental movement and who often advocate the planning Malin despised." See Richard White, "American Environmental History: The Development of a New Historical Field," *Pacific Historical Review* 54 (August 1985): 319.

# College AGRICULTURAL EXPERIMENT STATION



government directed agriculture in the 1940s was squarely based on the steady progress farmers had made since the 1870s. Paradoxically, however, Malin documented that progress through the records of yet another government agency—the United States Department of Agriculture (USDA) Office of Experiment Stations. What Malin would not (or could not) see in 1944 was the already entrenched and interdependent relationship between Kansas wheat growers and the local USDA field station.

The telling difference for Malin in *Winter Wheat*, between government aid versus government interference, was whether it was farmer-centered. That is, did a government program evolve as a result of farmers' own perceived needs or was it foisted on them? Certainly Malin's faith in Kansas farmers' ingenuity and flexibility was directly on target when it came to winter wheat growing. After casting about for a generation for the most reliable (best adapted) varieties of winter wheat, Kansas farmers were amazingly



The USDA experiment stations helped boost production by assisting farmers with seed selection, fertilizers, pesticides, and other technical problems. This cartoon of an abundant yield, entitled "Some crop, eh?" appeared in the *Kansas City Journal*, June 24, 1914.

quick to adopt more technologically dependent systems of production to increase their efficiency. State sponsored research supported and encouraged this shift to technical dependency. Yet farmers' new and almost total reliance on manufactured implements and gasoline-powered farm equipment only increased their reliance on the local extension agent for help with seed selection, fertilizers, pesticides, and other technical decisions to help them keep ahead of their capitalization debts. Station scientists for their part reinvented their role as farm advisors to include agricultural economics to help farmers make informed decisions based on marketing research. Instead of asking farmers what they needed and wanted, USDA researchers slowly shifted their attention to the other end of the production cycle to discern and analyze the needs of consumers. In the context of agricultural station research, farmers were no longer the inventors of Kansas wheat culture as Malin described them. They were now simply producers who worked in cooperation with other members of the agricultural business sector in the wider state, national, and international economies.

This study of the relationship between Kansas wheat farmers and USDA experiment stations in the twentieth century suggests three developmental stages. In the original research stage, USDA scientists worked on problems related to plant selection, fertilizers, formulas for preparation of the soil, and other basic information. This phase of research lasted approximately to World War I. In the second stage, scientists and farmers became versed in the use of machinery aimed at more efficient harvesting methods, reduced labor and transportation costs, and the use of modern accounting practices. Both research and development were critically important in the development of wheat farming in Kansas, but in the prosperous post-World War II era they were already reaching their limits in terms of sustaining farmers' economic security. The only new avenue for improvement for wheat scientists was in aggressively marketing wheat products to a wider consumer audience. Pleasing processors and consumers by creating products that fit their needs eventually became the focus

of experiment station research after World War II and remains so today. This has caused, in the opinion of one agricultural economist, the farm sector (composed of farm organizations, congressional committees, the USDA, and the Land Grant school system) to have "lost control of the farm policy agenda."<sup>3</sup> While Malin supported and applauded the first two stages in the evolution of Kansas wheat culture he likely would have been disappointed by farmers' and scientists' increasing need to gauge consumers' perceptions of appropriate farm policy and practices.

USDA scientists' initial investigations in winter wheat farming in Kansas centered on the search for a suitable wheat variety for the state. The origin of winter wheat and its adoption was of intense interest to Malin, and he spent a considerable amount of time gathering anecdotal and newspaper evidence to prove that

3. Don Paarlberg, "The Changing Policy Environment for the 1990 Farm Bill," *Journal of Soil and Water Conservation* 45 (January-February 1990): 8.

central Kansas farmers had spontaneously adopted the hard red varieties through word of mouth, example, and experience. To support his theory of adaptation to a sub-humid climate, Malin laboriously cited Kansas experiment station notes in which several strains of Turkey wheat, variously named Odessa, Russian Amber, Hungarian, and Bulgarian, were given station trials in the early 1880s. He was highly skeptical of the Mennonites' claim to introducing hard red wheat to Kansas, sarcastically suggesting that it was unreasonable to believe that newspapers in the McPherson area would not have mentioned this wondrous development before the 1890s.<sup>4</sup> As positive evidence of the wisdom of the average Kansas wheat farmer, Malin also pointed to the downfall of T.C. Henry, whose brief Kansas wheat empire was imprudently built on soft spring wheat.<sup>5</sup> In each case, Malin's object was to demonstrate the resiliency of the average Kansas wheat farmer in having taken up winter wheat farming in response to natural conditions. In Malin's view, the gap between rural intuition and scientific investigation was never very wide. The scientists always caught up eventually.

Malin's skepticism of the Mennonites' claim to the introduction of hard red winter wheat was sustained by historian Norman Saul, whose research into the origin of winter wheat seed in Kansas led him to conclude that although Mennonite farmers likely brought seed with them from Molochna in Ukraine in the 1870s, the widespread distribution of the several varieties of Turkey Red was the result of the efforts of several people including farmer-entrepreneur Bernhard Warkentin and wheat scientists W. T. Krehbeil, Edward M. Shelton, and Mark Carleton. Over several decades the Kansas Experiment Station in Manhattan imported numerous Russian varieties, tested and crossed them, and then marketed them to farmers via county fairs, millers, and the railroads. Finally, new markets for high gluten flour and the development of steel rollers for milling the harder varieties provided the last chapters in the story of the "miracle" of winter wheat in Kansas.<sup>6</sup>

4. James C. Malin, *Winter Wheat in the Golden Belt of Kansas: A Study in Adaption to Subhumid Geographical Environment* (New York: Octagon Books, 1973), 167.

5. Homer Socolofsky, "The Agricultural Heritage" in *The Rise of the Wheat State: A History of Kansas Agriculture, 1861-1986*, ed. George Ham and Robin Higham (Manhattan, Kans.: Sunflower University Press, 1987), 23-24. A hagiography of T. C. Henry can be found in Stuart Henry, "Kansas Winter Wheat," Special Collections, Kansas State University, Manhattan, hereafter cited as Special Collections.

6. Norman E. Saul, "Myth and History: Turkey Red Wheat and the 'Kansas Miracle,'" *Heritage of the Great Plains* 22 (Summer 1989): 10.

Malin's philosophy of history was the re-creation so far as possible of the "point of view of the people of a given period who were looking into the unknown future."<sup>7</sup> This philosophy gave him an extreme sense of empathy for early Kansas wheat farmers. Crop failures were common: pests that arrived in biblical proportions, untimely rains, hailstorms, and other climatic problems all conspired against farmers' raising winter wheat. This created the informational vacuum that USDA experiment station scientists hoped to fill. As the director of the Fort Hays Experiment Station recalled in 1916, farming methods before 1900 "were not successful and they met with failure, either partial or complete for so many years in succession that a large percentage of these farmers were compelled to sacrifice most of their belongings and leave their homesteads. . . . [T]he hardships experienced and told by the few remaining pioneers are almost unbelievable."<sup>8</sup> The lack of a stable winter wheat crop had, according to the director, convinced western Kansas farmers of the wisdom of pasturing cattle in addition to raising wheat. This meant that farmers also had to learn how to raise a variety of other crops, "hence the reason for experiment stations now scattered over the Plains."<sup>9</sup>

Malin's interpretation of the introduction of hard winter wheat in Kansas, as a spontaneous evolutionary development, necessarily skewed the relationship between experiment station scientists and farmers in the years before World War I. While station workers did investigate wheat varieties (some two thousand between 1906 and 1910), their primary goal was to create a system of diversified agriculture that would give farmers a more reliable income. This led station staff in several directions at once to demonstrate the variety of products a farmer in Kansas might produce and thus ensure himself against the vagaries of both climate and the market. To this end, the Kansas legislature authorized a branch experiment station on the grounds of old Fort Hays in 1902, recognizing that the Manhattan location in the Flint Hills could not effectively reach out to farmers in central and western Kansas. Station staff at Fort Hays held farmers' institutes and traveled widely to disseminate

7. Thomas Burnell Colbert, "A Most Original Thinker: James C. Malin on History and Technology," *Kansas History: A Journal of the Central Plains* 19 (Autumn 1996): 181.

8. Fort Hays Experiment Station, *Annual Report, 1916*, Special Collections.

9. *Ibid.*



nate new information. They published circulars in local papers and wrote bulletins that they mailed to farmers on request. "Field Days" and livestock judging contests lured hundreds of local farmers to the station each year where they could see the results of the experimental work firsthand. They also were instrumental in the distribution of seed, particularly after 1900 when, in cooperation with the railroads, they were able to transport free quality seed to the entire state in a timely manner. Lastly, they created partnerships with other researchers, like those in the federal Office of Dry Land Agriculture who toured the Fort Hays substation in 1906.<sup>10</sup> In some cases, as in the selection of high quality winter wheat seed, station staff were highly successful. In other areas, as in their recommendations that farmers diversify their operations, they were virtually ignored.

This lack of farmer response to diversified farming was not a large problem for station staff as long as the winter wheat crop continued to bring in cash for credit-starved farmers and their own funding for more basic research remained secure. As the director of the Hays station wrote, "most people think wheat is one of the sure money crops and therefore has been grown too extensively. . . . There is no doubt but that continuous cropping will be practiced for some time to come even though the experiences of older countries teach us the danger of this practice."<sup>11</sup> The uneasy feeling station staff had about farmer's wholehearted investment in winter wheat farming slowly dissipated between 1900 and 1918 as wheat prices reached historic highs and mechanical wheat harvesting became more efficient and better organized. With the sharp post-war decline in agricultural prices in 1919, however, farmers were again officially encouraged to diversify their operations and manage their farms more efficiently. As the Kansas State Board of Agriculture's annual report to the legislature noted, "economic disturbances now upon us as a consequence of war cannot wholly be turned aside by human agencies, but better farm management is a medium through which each individual may improve his situation."<sup>12</sup> Station staff recognized too that their efforts in wheat breeding had improved the crop so much that farmers were now able to turn their attention to other aspects of farming, including mechanization and storage.

They believed that reducing labor costs together with the ability to store grain (as insurance against low prices) also worked to meet their ultimate goal for Kansas wheat farmers, which was financial security equal to other sectors of the economy.

This next phase in the relationship between farmers and experiment station staff—the development stage—Malin considered a highly positive new direction and proof of farmers' continuing adaptation to their environment. Interestingly, scientists rather than farmers were the examples of technological ingenuity Malin chose to support his adaptation thesis, noting for example that in 1888 experiment station director Edward Mason Shelton's "experimental attitude toward adaptation to environment" had led to research on a listing plow for wheat based on corn listers. As Malin stated in the conclusion of *Winter Wheat*, "The difference in behavior among individuals, private organizations and government agencies is immaterial in these respects."<sup>13</sup> In a kind of intellectual coup de grace, Malin hypothesized that any sincere effort on the part of intelligent human beings, or "innovation," inevitably led toward progress in adaptation to the Plains. Whether belonging to a farmer or a scientist, Malin wished to see the free hand of innovation left to its own devices without the interference of any "government bureaucracy [*sic*]."<sup>14</sup>

But the center of technological innovation already was shifting from the farm and the experiment station to the implement dealer with profound consequences for the agricultural community. Although agricultural historians have long noted that tractors did not outnumber horses and mules until 1955, the Plains states were far ahead of most of the country in accepting new agricultural technology, and a majority of Kansas farmers owned tractors by 1925. According to agricultural historian R. Douglas Hurt, 75 percent of the 1929 winter wheat harvest on the Great Plains was accomplished by gasoline-powered combines.<sup>15</sup> Statistical evidence for this shift is further backed by a rather deep pool of anecdotal evidence. Wheat farmers in-

10. *Ibid.*, *Annual Reports, 1902–1906*.

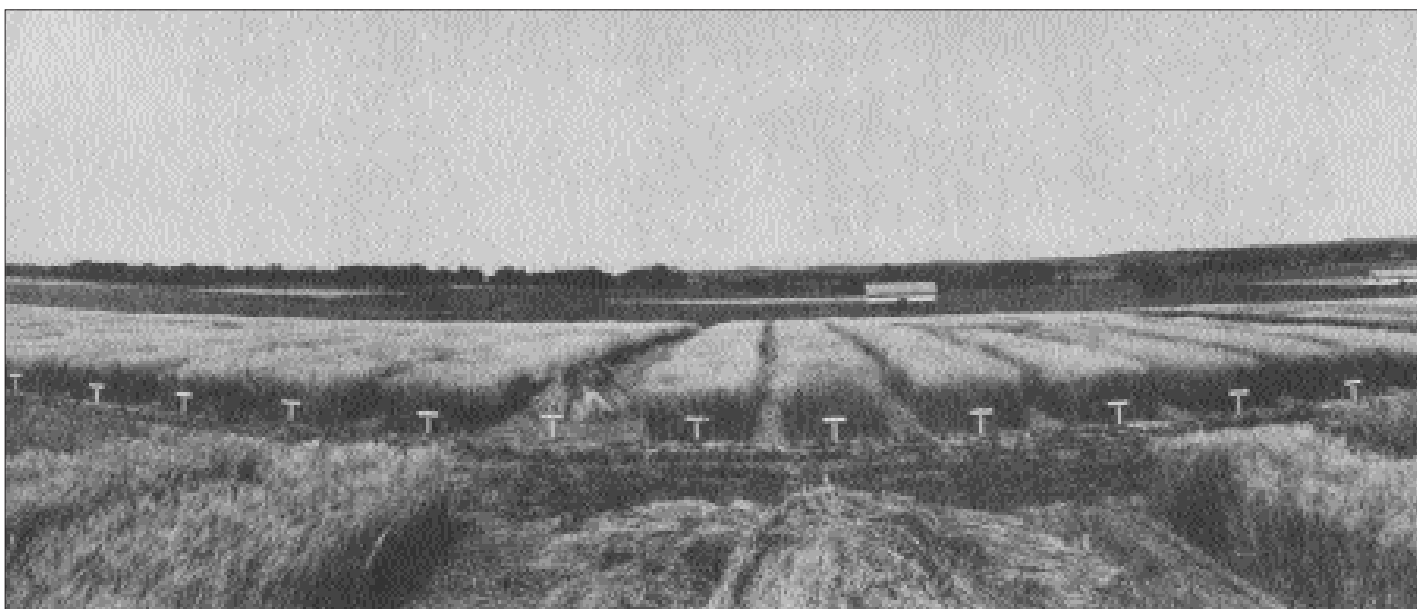
11. *Ibid.*

12. Kansas State Board of Agriculture, *Twenty-Second Biennial Report, 1919–1920* (Topeka: Kansas State Printing Plant, 1921), ix.

13. Malin, *Winter Wheat in the Golden Belt of Kansas*, 235.

14. *Ibid.*, 252.

15. R. Douglas Hurt, *American Agriculture: A Brief History* (Ames: Iowa State University Press, 1994), 252; see also Robert C. Williams, *Fordson, Farmall and Poppin' Johnny: A History of the Farm Tractor and Its Impact on America* (Urbana: University of Illinois Press, 1987); David B. Danbom, *Born in the Country: A History of Rural America* (Baltimore: Johns Hopkins University Press, 1995), 196–97.



Experiment stations researched and analyzed wheat varieties to develop those best suited to Kansas farming. These test plots were planted on the agronomy farm at the experiment station in Manhattan, 1927.

vested early in agricultural machinery, especially harvesting equipment, and Kansas farm boys often worked summers for custom combining outfits. As Solomon Loewen recalled, mechanical harvesting after the turn of the century was a community-based activity organized through threshing rings. The introduction of affordable tractors and especially combines after 1940, however, meant that farmers no longer needed to rely on each other for help. "Harvesting became an individual family affair, not the enlarged family and community activity it used to be," explained Loewen.<sup>16</sup> Farm men and women now had greater freedom to develop their farming enterprises in isolation from their neighbors.

Experiment station research also was shifting from basic research to the development and assessment of new mechanical technology by the mid-1920s. This was a logical step in the station's long standing goal of helping farmers stretch their investments in land, labor, and capital to offset low prices and poor harvests. In essence, the new emphasis on mechanization and efficient production through lowering labor costs was consistent with the initial goal of experiment station work, which was aptly summarized in a popular 1920s USDA circular entitled *How to*

*Make the Farm Pay*. The precipitous drop in farm income that followed World War I, however, had a direct effect on wheat farming in Kansas and on the kinds of work performed at the experiment stations. In a radical departure from regular "lines of work," as they called them, the staff of the USDA's new Bureau of Agricultural Economics conducted a survey in land tenure that was completed in 1919. Scientists' worst fears were confirmed when they found that the average age at which a farmer could be expected to own his own farm (the upper rung of the agricultural ladder) had risen from 24.6 years in 1875–1880 to 34.7 years in 1915–1919.<sup>17</sup> Gilbert Fite's recounting of his own South Dakota grandparents' futile struggle to hold on to their land and their heirs' inability to capitalize on their parents' hard work through the 1920s and 1930s is a perfect example of the consequences of those trends station scientists were seeing even before the bottom fell out of the market in 1919.<sup>18</sup> In essence, wheat farmers were falling farther behind in spite of everything station scientists had accomplished in terms of research and development.

16. Solomon Loewen, "Harvesting in Kansas During the Early Decades of this Century: A Reminiscence," *Kansas History: A Journal of the Central Plains* 13 (Summer 1990): 87.

17. Fort Hays Experiment Station, *Annual Report, 1918–1919*, 10, Special Collections.

18. Gilbert C. Fite, "Failure on the Last Frontier: A Family Chronicle," *Western Historical Quarterly* 18 (January 1987): 5–14.



One phase of USDA research involved improving farm machinery to facilitate more efficient harvest methods. These four photographs, left and on the facing page, illustrate various types of harvest equipment from the 1910s to the 1950s: TOP LEFT: Horses provide the power for cutting and binding wheat on the G. A. Garret farm, Russell County, 1912. BOTTOM LEFT: Steam-powered equipment and manual labor were the major resources for wheat threshing during the early decades of the twentieth century. Edwards County. TOP RIGHT: Combines greatly reduced a farmer's time and labor. Tractor-pulled machines were the first to be developed, as seen in this early 1930s photo. BOTTOM RIGHT: By the 1950s self-propelled combines were common and further eased the workload. Photo taken in 1957.

with Malin's thinking, the company was founded on the premise that "thousands of acres were being handled ineffectively because of a lack of power, because of lack of capital, because of mortgage debt and because of broken morale among owners and producers."<sup>22</sup>

In a shameless use of social evolutionary theory, the WFC painted a rosy picture of inevitable progress—as defined by a decrease in hard labor and an increase in

One response to this economic slide was corporate farming. A primary example was the Wheat Farming Company (WFC) based in Hays, Kansas, and Kansas City, Missouri.<sup>19</sup> In a remarkable little 1930 booklet, which lifted the majority of its information from the publications of publicly funded research stations, author and company president John S. Bird compared Kansas land to the great eastern factories. Manufacturing, Bird claimed, had caused Kansas to "look upon her eastern sister states with a feeling almost of envy."<sup>20</sup> His solution, of course, was to turn Kansas wheat farms into factories. In addition to profitably farming their seventy-one thousand acres of Kansas wheat land, the WFC hoped to re-educate Kansas farmers in efficient mechanization, shrewd mathematical calculation, and positive thinking.<sup>21</sup> Very much in line

income. The key was greater production on a larger scale for less money. More efficient production, the company claimed, would raise farmers out of debt even if the cost of wheat fell below parity prices. The company's claim that political solutions were of no lasting usefulness, that the answer to wheat farmers' problems lay in their own energy and efforts, belied its ties to established financial interests and appealed to widespread notions of agrarian fundamentalism. Although the WFC went into receivership in 1931, its presumed viability underscored wheat farmers' increasing dependency on outside experts for technical advice. While adhering to some of the sentiments expressed by the WFC, western Kansas farmers were not ready to repeal their loyalty to local landownership, and they outlawed corporate farming that same year.<sup>23</sup>

19. J. S. Bird, *An Independent Kansas Agriculture Through Self-help* (Kansas City: Wheat Farming Co., n.d.), Special Collections.

20. *Ibid.*, 3.

21. Craig Miner, *Harvesting the High Plains: John Kriss and the Business of Wheat Farming, 1920–1950* (Lawrence: University Press of Kansas, 1998), 160.

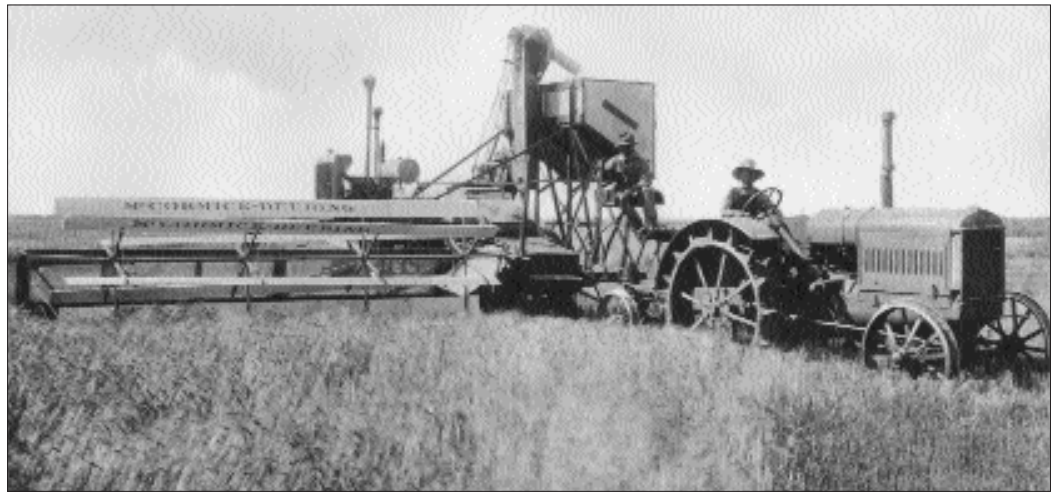
22. Bird, *An Independent Kansas Agriculture Through Self-help*, 17.

23. Miner, *Harvesting the High Plains*, 160.



The wheat farming crisis of the 1930s in Kansas, as graphically depicted in Lawrence Svobida's autobiography *Farming the Dust Bowl*, only increased the pressure experiment station scientists felt to pull farmers out of the economic basement. Certainly Malin would not have approved of Svobida's ultimate adaptation to the state, which was to move away and start a new life elsewhere. Nor would he have relished Svobida's parting remarks that better farming methods would only be adopted "under strict regulation by wise laws adequately enforced."<sup>24</sup> For experiment station scientists, the application of New Deal laws governing their relationship to Kansas wheat farmers became a source of tension and confusion about their original goals and objectives. In a highly suggestive understatement, the director of the Fort Hays Experiment Station reported in 1935, "For the past two years, the Station has cooperated with the AAA in its program for control of wheat production, believing that the plan *might* [emphasis added] be of value in developing practical means of crop production control."<sup>25</sup>

The fact was that wheat scientists felt wholly threatened by the introduction of new federal programs into what had traditionally been a closed local system. As Milton Eisenhower, who later became president of Kansas State University, put it in 1940, "State workers could per-



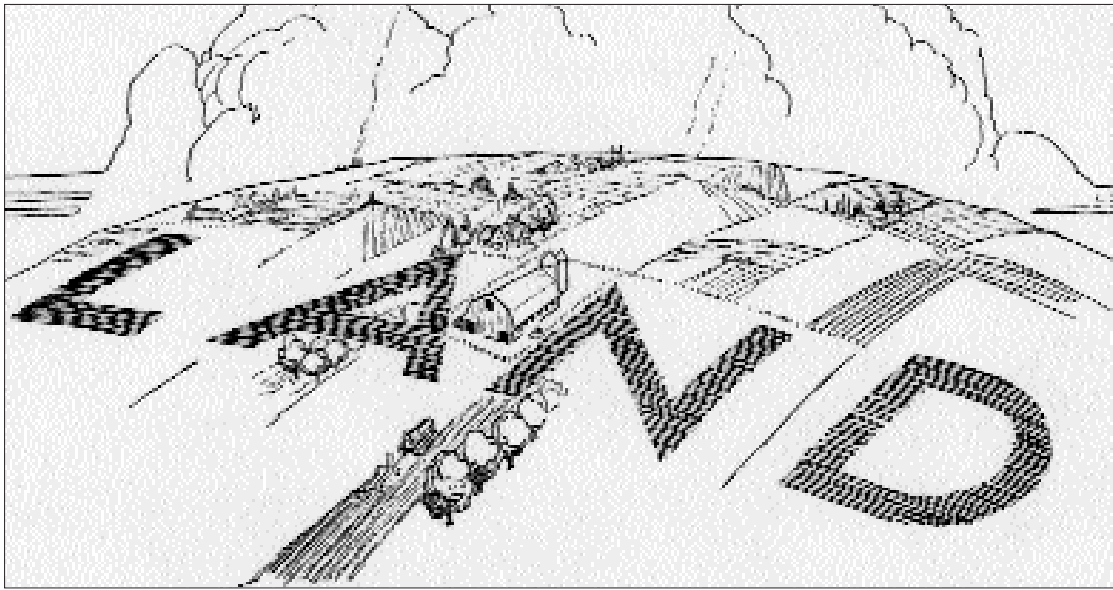
haps see themselves gradually falling into what Grover Cleveland once called a condition of innocuous desuetude."<sup>26</sup> Also understood by station staff was implicit criticism of their work, which had first focused on increasing crop yields through basic research and then increased efficiency through the use of machinery. Over-production was now considered the culprit in farmers' economic tumble, and station staff who formerly took pride in helping farmers accomplish just that were left to scratch their heads as to their next project emphasis. Worse than this, by 1940 it was clear that funding for basic research at the

24. Lawrence Svobida, *Farming the Dust Bowl: A First-hand Account from Kansas* (Lawrence: University Press of Kansas, 1986). Svobida's account originally was published in 1940 under the title *An Empire of Dust* (Caldwell, Idaho: Caxton Printers, 1940); *ibid.*, 248.

25. Fort Hays Experiment Station, *Annual Report, 1935*, 11, Special Collections.

26. Milton S. Eisenhower and Roy I. Kimmel, "Old and New in Agricultural Organization," *Yearbook of Agriculture, 1940* (Washington, D.C.: Government Printing Office, 1940): 1131.





*One response to wheat marketing problems was corporate farming. In 1930 J. S. Bird of the Wheat Farming Company based in Hays and Kansas City compared Kansas land to industry in the East. Kansas, Bird wrote, possesses a great manufacturing opportunity in her level, fertile land.*

station level could no longer be taken for granted. Formerly secure in their mission to aid farmers struggling with market forces beyond their control, station scientists, particularly wheat scientists, now found themselves subject to those same forces in maintaining their research programs.

As Alan Marcus, an agricultural policy historian, has clearly laid out, after World War II federal money that formerly would have gone to agricultural research was funneled instead to two new research institutions: the National Science Foundation (NSF) and the National Institutes of Health (NIH). This meant agricultural researchers were “frozen out of the extended review process by the Johnnies-come-lately.”<sup>27</sup> The emergence of the NSF and NIH also caused good station scientists in agricultural research to find positions elsewhere, thus further weakening the experiment station system. Creation of the Agricultural Research Service in the mid-1950s only exacerbated the problem by making funding for crop research competitive through granting schemes that pitted experiment stations against one another. Finally, according to Marcus, the National Agricultural Research, Extension and Teaching Act of 1977 allowed all scientists, not just those associated with state programs, to compete for money traditionally set aside for station research.<sup>28</sup>

Not surprisingly, publicly funded wheat research has had to forge new partnerships with private groups and industries to maintain its programs. As a result, private consultation is taking over the role of the USDA as farmers’ primary information source. As Steven Wolf of the Department of Agricultural and Resource Economics at the University of California at Berkeley recently wrote, “Agriculture is increasingly becoming more like other industries as the ‘social contract’ between agriculture and society is eroding.”<sup>29</sup>

One clear example of this new focus on marketing and marketing research in Kansas wheat culture is the development of new varieties of white winter wheat. While Kansas remained ideal for the production of hard red winter wheat, scientists in the early 1970s began an intensive research program to develop a hard white variety for Kansas. The reasons for the shift were clear: white wheat was more desirable for consumers both at home and abroad. In January 1978 wheat scientist Floyd Smith stated that the station was working on a white winter wheat variety because “Wheat growers want help in stimulating markets.”<sup>30</sup> About the only advantage hard red winter wheat had over white wheat, according to Smith, was that it did not sprout in the head as easily as white winter in the Kansas climate. In other words, red winter wheat was better climatically

27. Allan I. Marcus, “The Wisdom of the Body Politic: The Changing Nature of Publically Sponsored American Agricultural Research Since the 1830s,” *Agricultural History* 62 (Spring 1988): 4, 25–26.

28. *Ibid.*

29. Steven Wolf, ed., *Privatization of Information and Agricultural Industrialization* (New York: Social and Water Conservation Society, 1999), 153.

30. “White Winter Wheat: A Promising Crop,” *K-Stater* 27 (January 1978): 1.

but was not as marketable. Beginning in 1969 the experiment station's mission was to create a hard white winter wheat that performed as well as hard red in Kansas soils. In the early 1970s the white wheat breeding program for Kansas was given a major boost by private wheat grower Earl Clark of Sedgwick County, whose variety of hard white was resistant to early sprouting. Scientists were certain this would make Kansas wheat more competitive with white wheat grown in Canada and Australia.

Ironically, scientists' projects to introduce white winter wheat to Kansas were stymied not by difficulties in creating a new variety but in marketing it within an established system based on hard red winter wheat. According to the U.S. Standards for Wheat, adopted in 1917, growers or buyers could not market hard white apart from soft white varieties. The U.S. Standard for Wheat finally was updated for the first time in 1990—twenty years after the Kansas experiment station began work on a hard white variety. Also essential to the effective marketing of hard white wheat was maintaining separate storage facilities. This was a major obstacle in Kansas where storage and transportation have always been at a premium. The farmer who risked growing white winter wheat also risked not being able to store or transport his harvest. Lastly, hard red wheat is an eager volunteer in the spring where it has been planted before, making it possible for red wheat to become mixed into a white wheat harvest and reduce the value of the crop to a "mixed" wheat suitable only for a few markets. As a result of these marketing difficulties, the Kansas Experiment Station's first white winter wheat variety, named Heyne after the first scientist to suggest research on the crop in 1968, was not released until 1998. Solving the marketing problems of white winter wheat has been an integral part of the experiment station mission and remains so today.<sup>31</sup>



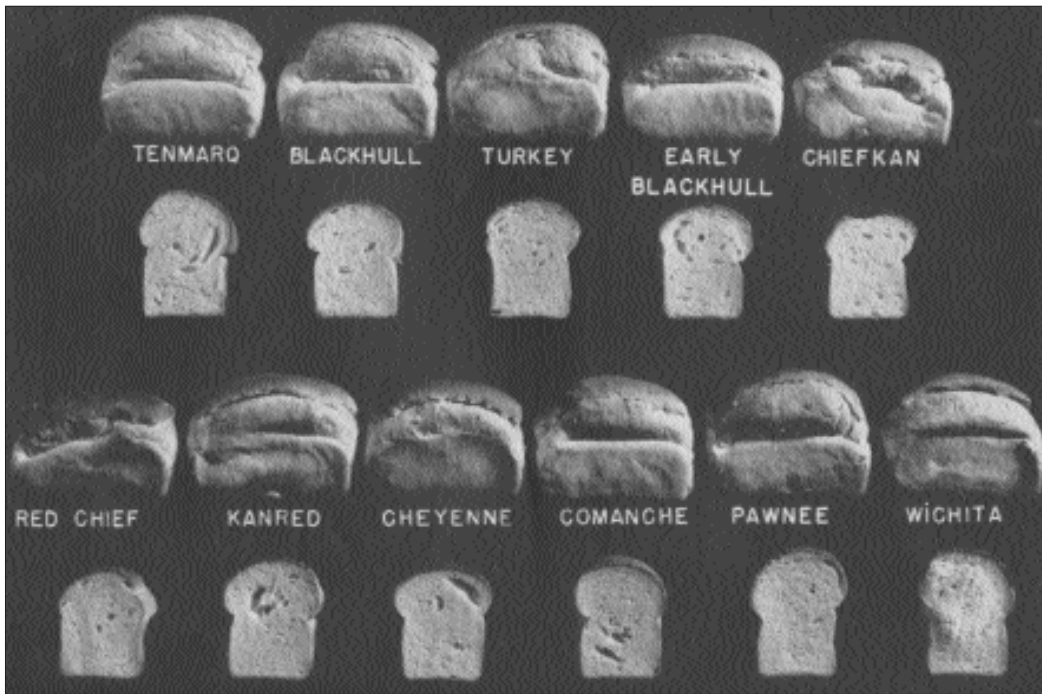
*During economic difficulties, experiment stations assisted farmers in low-cost production methods, enabling them to secure some profits from their labors.*

And how have Kansas wheat farmers fared as a result of the experiment station focus on marketing? On the one hand, Kansas wheat has continued to increase in productivity with both yields and harvests reaching unprecedented heights. This has been a direct result of experiment station research during the past forty years in terms of wheat breeding with nearly 75 percent of the 1998 wheat crop planted to Jagger, a hard red winter wheat developed by Kansas State University. From an average of 181 million bushels of wheat produced annually in the 1950s, Kansas wheat farmers in 1998 produced an astounding 494.9 million bushels of wheat. Similarly, the average wheat yield on Kansas farms has increased from 14.5 bushels per acre at mid-century to a whopping 49 bushels per acre in 1998.<sup>32</sup>

But increased productivity as a result of all this scientific research has not raised wheat farmers' standard of

31. Robert K. Bequette and Timothy J. Herrman, *Hard White Wheat, Keeping Up with Research 120* (Manhattan: Kansas State Experiment Station, 1998).

32. Kansas State University Agricultural Experiment Station and Cooperative Extension Service, *1998 Kansas Performance Tests with Winter Wheat Varieties*, Report of Progress 816 (Manhattan: July 1998), 4; Kansas State Board of Agriculture, *Kansas Farm Facts* (Topeka: Kansas Agricultural Statistics, 1997), 9.



*Red wheat varieties, used to create the bread at left, have resulted from years of experiment station wheat breeding programs. Currently taking center stage is a hard white wheat, which possibly has greater marketing potential.*

living. Using the indices of land, labor, and capital in 1966 as the standard, a recent study claimed that wheat farming income in 1980 had risen only slightly above the 1966 level.<sup>33</sup> This conclusion is supported by the USDA's own office of Agricultural Statistics. Specifically, the USDA routinely maps how much of the American food dollar goes to producers compared with other sectors of the agricultural economy such as processors, advertising, energy, and transportation. In 1997, the most recent year for which statistics were available, 79 percent of food expenditures went to marketing. In a glutted wheat market, other factors such as storage, which further works to depress the farmers' share of the food dollar to just a few cents, come into play. Kansas farmers who produced hard red winter wheat in 1999 received an average of \$2.30 per bushel. Compared with the \$2.14 Kansas wheat brought at the height of the food crisis during World War I, the 1999 price represents a net loss of income.

In his study of winter wheat in Kansas, Malin wrote that "a good case may be spoiled by claiming too much, by over-statement, and failure to make careful discrimination."<sup>34</sup> Documenting the relationship between the experi-

ment stations in Kansas and the state's wheat farmers becomes especially difficult as layers of experience become harnessed to historic events far beyond the imaginations of either the station staff or farmers when they first encountered one another in the late nineteenth century. Today the conflicted nature of the wheat scientist and the "farmer," whoever he or she may be, is a consequence of several factors, not the least of which is the changing nature of farming itself. The winner-takes-all attitude of bonanza operators of the late nineteenth century has become common again among twentieth-century wheat farmers in Kansas. An increasingly competitive environment has led local extension agents to respond to the increasingly market-driven concerns of farmers, particularly in the area of new technology.

One recent manifestation of this change came in 1998 with the creation of the Wheat Research Center (WRC) at Kansas State University. Funded by a variety of sources, both public through the USDA and private through seed, processing, and storage companies, the WRC embodies the changes in the relationship between wheat farmers (now producers) and the staff of the experiment stations in Kansas. Self-described as a "customer-centered research and resource organization" the WRC will overlap with the historic functions of the experiment station's involvement with wheat growers by helping to "disseminate scientific information, improve the competitiveness and profitabili-

33. Deivan Durai, "Analysis of Returns to Agricultural Research on Wheat and Wheat Productivity in the Great Plains 1966 to 1980" (Ph.D. diss., Kansas State University, 1985).

34. Malin, *Winter Wheat in the Golden Belt of Kansas*, 102.




Because today's Kansas harvests are producing unprecedented highs, creating new markets for wheat products continues to be critical for the survival of wheat producers. The longest elevator in the world, right, stands at Hutchinson, filled with golden grain, and, like today's farmers, looks out over an unknown future.



ty of the nation's wheat industry, to enhance environmental quality and develop a strategic plan for the future of the U.S. wheat industry." Most striking about this new organization is the complete lack of attention to rural life, farming people (the term "producers" can mean corporations), and the historic relationship between farmers and station staff.

Other extension projects have attempted to breach the gap between producers and consumers by creating new markets for wheat products. By and large the benefactors of this research have not been wheat producers but corporate processors, although Kansas recently has seen the creation of several new farmer-owned processing cooperatives. Midwest Grain Products (MGP), a farmer-owned cooperative of wheat growers, is experimenting with numerous new wheat-based (gluten) products ranging from chicken meat substitutes to cosmetics and biodegradable

golf tees. The biggest difficulty that MGP faces, according to its president Ladd Seaberg, is that other countries have already developed several new wheat-based products and have captured a large portion of the American market.<sup>35</sup> Along with the Kansas Association of Wheat Growers and the 21st Century Alliance, MGP is just one of several initiatives by farmers to reach American consumers directly. This shift in focus from family farmer to professional marketer is not what Malin anticipated in describing farmers' successful adaptation to the subhumid environment of central and western Kansas in 1944. At the dawn of a new millennium, Kansas wheat farmers are now gazing into an unknown future—far beyond *Winter Wheat*. 

35. Dana Fields, "Company Turning Wheat Into Cosmetics and Golf Tees," *Wichita Eagle*, September 19, 1999.