1933

Agricultural experiments in Iowa during the Civil War decade

Leila Mae Bassett

Iowa State College

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AGRICULTURAL EXPERIMENTS IN IOWA DURING THE
CIVIL WAR DECADE

BY

Leila Mae Bassett

A Thesis Submitted to the Graduate Faculty
for the Degree
MASTER OF SCIENCE
Major Subject Economic History

Signatures have been redacted for privacy

lege
1933
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AGRICULTURAL EXPERIMENTS IN IOWA DURING THE CIVIL WAR DECADE

I

CONDITIONS IN IOWA AT THE OPENING OF THE PERIOD

Population

The Iowa of 1860, with a population of 674,913, ranked twentieth among the nation's thirty-three states. All of Iowa was occupied but a small triangular piece of territory in the northwest, and the present counties of Lyon and Osceola were the only ones not organized.¹

The density areas of population were along the Mississippi River and extended in a northwesterly direction from Lee County. Dubuque was the largest county, with a population of 31,164. Almost one-third (32) of the counties had a population of between 5,000 and 15,000 each; and there were only fourteen counties in the state with a population of more than 15,000. These were Clayton, Clinton, Des Moines, Dubuque, Henry, Jackson, Jefferson, Johnson, Lee, Linn, Marion, Muscatine, Scott and Van Buren.²

There were only six cities with a population of more than 5,000, and they were all located along the Mississippi River except Iowa City. Burlington, which until 1860 had been the largest city, was that year surpassed by Davenport and Dubuque. The other two cities were Muscatine and Keokuk.

Immigration to Iowa was both native and foreign, with a ratio of approximately 4 to 1. The sources of immigration are shown by the following table:

<table>
<thead>
<tr>
<th>State</th>
<th>Number</th>
<th>Country</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>New England States</td>
<td>25,040</td>
<td>England</td>
<td>11,522</td>
</tr>
<tr>
<td>New York</td>
<td>46,053</td>
<td>Ireland</td>
<td>23,072</td>
</tr>
<tr>
<td>New Jersey</td>
<td>4,114</td>
<td>Scotland</td>
<td>2,895</td>
</tr>
<tr>
<td>Pennsylvania</td>
<td>52,156</td>
<td>Wales</td>
<td>913</td>
</tr>
<tr>
<td>Ohio</td>
<td>99,240</td>
<td>German States</td>
<td>38,555</td>
</tr>
<tr>
<td>Indiana</td>
<td>57,555</td>
<td>Holland</td>
<td>2,615</td>
</tr>
<tr>
<td>Illinois</td>
<td>26,696</td>
<td>Scandinavia</td>
<td>7,814</td>
</tr>
<tr>
<td>Other Western States</td>
<td>10,371</td>
<td>France</td>
<td>2,421</td>
</tr>
<tr>
<td>Southern States</td>
<td>54,856</td>
<td>Other European</td>
<td>2,303</td>
</tr>
<tr>
<td>Born in Iowa</td>
<td>191,148</td>
<td>British America</td>
<td>8,313</td>
</tr>
<tr>
<td>At sea or unknown</td>
<td>1,603</td>
<td>Other countries or unknown</td>
<td>158</td>
</tr>
</tbody>
</table>

Total 568,932

Most of the native population who removed to Iowa came from Ohio, Indiana, Pennsylvania, Illinois, and New York; and many, too, came from Wisconsin, Minnesota, and Kansas. Meanwhile, by 1860, 37,555 native-born Iowans had migrated

3. Preston, Howard H., The history of banking in Iowa, p. 49.
4. Iowa Board of Immigration, Iowa; the home for immigrants, p. 67.
to other states, principally Missouri, Illinois, Kansas, and California.

The foreign population came largely from the British Isles. Continued crop reverses and ensuing panics gave many the impetus to remove to the United States. Most of the foreign immigrants settled in the southern counties. Dubuque, Lee, Scott, Clayton, and Des Moines were the five highest ranking counties in foreign population. Nine other counties had foreign populations of more than 15,000. They were Clinton, Henry, Jackson, Jefferson, Johnson, Linn, Marion, Muscatine, and Van Buren.5

Industries

Iowa in 1860 supported 1939 manufacturing establishments with a capital of $1,247,130 and with products of an annual value of $14,289,015.6 Manufacturing plants included 540 lumber and saw mills, 44 factories for agricultural implements, 15 meat slaughtering and packing plants, 12 woollen mills, 118 boots and shoes factories, 7 establishments for making soap and candles, and 52 distilleries for making malt and spirituous liquors. Manufacturing was carried on for local consumption only, for the main interest of the state was in agriculture.

Again the largest manufacturing counties were those which supported the largest population: Appanoose, Clinton, Des Moines, Dubuque, Lee, Linn, Muscatine, Scott, Clayton, and Washington. Dubuque and Davenport were the two leading manufacturing cities.\(^7\)

The General Assembly of Iowa in 1855 provided for a geological survey of the state. The survey was discontinued in 1857, however, and not re-established until some years later. Meantime sixty-nine coal mines had been opened, and the inadequate survey made estimated that coal covered approximately 20,000 square miles. The coal was bituminous and the 1860 production to June 1, yielded 72,500 bushels valued at $6,500.\(^8\)

Lead had been mined since 1833 when large quantities had been taken from the area around Dubuque. Estimates showed between 4 and 6 million pounds smelted annually at Dubuque, with a yield of 68 to 70 percent lead.\(^9\) The lead area was confined to a strip four or five miles wide extending up and down the river from Dubuque, which was founded largely because of the mines in that region. To a limited extent gypsum was mined, the bed located at Fort

---

7. *U. S. Census of 1860, Vol. on Manufactures*, pp. 161-162. There were 102 cities in the United States in 1860 with a population of over 10,000; Iowa had two of them, Dubuque and Davenport.
Dodge constituting one of the largest fields in the country. Gypsum was used largely for building and paving purposes.

**Agriculture**

Agriculture was still primarily in the pioneer stage. Most of the important machinery, including the plow, corn planter, two-horse cultivator, mower, reaper, and steam thresher had already been invented, but lack of capital and real need hindered their extensive use. Recent crop failures, financial losses resulting from the panic of 1857, and the consequent depression made the agricultural outlook gloomy. Iowa in 1860 ranked 15th with 3,792,792 acres of improved land and 6,277,115 acres of unimproved land. The cash value of the farms was $119,899,547. Most of the farms varied in size from 20 to 50 acres; a great many were from 50 to 100 acres; and numerous others were from 100 to 500 acres.

Wheat was the staple crop in every county, though it was best adapted to the northern counties. However, in 1858 and 1859 poor crops, insects, and inferior seed so decreased the production that corn temporarily became the leading crop. The yield of that crop in 1860 (42,410,686

bushels) increased in Iowa more than in any other corn growing state, and more than half as much was produced as in all the New England and Middle Atlantic states.¹² The enormous wheat crop of 1860 (8,449,403 bushels) again placed Iowa among the leading producers of that staple, and the yield placed Iowa eighth in production.

Oats was the third important crop in Iowa. The yield of 1860 was 5,887,645 bushels.¹³ Oats and corn were both used largely in the fattening of pork for market.

Barley, rye, and buckwheat were all subordinate crops. The yield for all of them was 865,830 bushels. Hops and tobacco were raised in limited amounts; and flax, the only crop which in 1860 showed an actual decline, was raised chiefly for the seed. Practically no root crops were raised for animal food.

The total valuation of livestock was $22,476,293.¹⁴ Cattle composed the largest class, although Iowa was not essentially a grazing state. Most of the settlers did not have enough money to own cattle for more than living needs.

¹⁴ Ibid., p. 274.
Cattle raising increased in importance when improved rail-road facilities made it possible to feed cattle so they could be taken to market with less shrinkage. Swine raising, especially pork for export, had been the only remunerative branch of farming for the preceding years. About a million and three-quarters dollars were invested in that, and consequently the tendency was toward better breeds. The sheep industry had been neglected. Tariff policies and regulations were designed to benefit the manufacturer and not the farmer. And so far woolen manufactures in the state had not assumed any place of importance.

Sorghum was produced only in sufficient quantities to supply home demand, and with uncertainty of manufacture and lack of adequate machinery, that could not always be met. Maple sugar and molasses were also made for home use.

Transportation

Transportation was primarily dependent on the Mississippi River and its tributaries. Wagon transportation was so inadequate that overland routes were used no more than the internal trade of the state required.

The first legislation designed to facilitate river transportation was that passed in 1838 which provided for

the improvement of the Des Moines River between its junction with the Mississippi and Raccoon Forks. To provide a stimulus to improvement, both state and national land grants were made along the river; the national government alone donated 900,000 acres below Raccoon Forks. During the course of the improvements, considerable difficulty arose between the commissioners of the River Improvement and the Des Moines Navigation and Railroad Company to whom contracts had been let for the improvement of the river from its mouth to the Forks, and active work on the river was postponed until after 1860.

Roads were unsatisfactory. The usual kinds built were the graded and planked roads, and during periods of rain they became virtually impassable. By 1846, it is true, a veritable network of highways connected the principal towns, but the importance of permanent roads was not seriously considered until some time later.

Nationally the period from 1848 to 1860 was one of railroad enthusiasm, encouragement, and construction. Water transportation was slow and during certain times of the year impossible. Roads were unsatisfactory. Settlers, through their steady and rapid increase in production, were clamoring for better means of marketing. They demanded railroads "at once and at any price."

19. Ibid., p. 17.
20. Ibid., p. 36.
come as quickly as the people desired them. Until 1854 no railroad reached the Mississippi from the east. 21

The first railroad survey within the state was made in the fall of 1852, and the following December the Mississippi and Missouri Railroad Company was formed to construct a road from Davenport to Council Bluffs.

In 1856 Congress made its first grant to Iowa to aid in railroad construction. The grant composed "every alternate section for six sections in width on each side of the [four] proposed roads" extending from the Mississippi to the Missouri. 22 Railroads so aided were to be retained for national use, free from toll or charge for transporting property or troops, and were to carry mail on such terms as Congress designated.

The four railroad companies to which grants were made were the Burlington and Missouri River Railroad Company; the Mississippi and Missouri Railroad Company; The Iowa Central Air Line Railroad Company; and the Dubuque and Sioux City and Tete des Morts Branch Railroad Company.

They were required to complete seventy-five miles of construction within three years, and thirty miles every

21. Riegel, Robert E., The story of the western railroads, p. 6. The Rock Island was the first railroad to reach the river; the Northwestern followed in 1855; and the Burlington in 1856. In eight years seven roads reached the river from the east.

year thereafter for five years. The whole line of each road was to be completed by 1865. In case the conditions were not met, the land granted was to revert to the state. The Iowa Central Air Line Railroad failed in the first condition; and in 1860 its grant was turned over to the Cedar Rapids and Missouri Railroad Company.

By 1860 Iowa had almost 680 miles of railroad, completed in five years' time at a cost of $19,494,633. The mileage was divided as follows.

<table>
<thead>
<tr>
<th>Railroad</th>
<th>Miles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Burlington and Missouri</td>
<td>93.30</td>
</tr>
<tr>
<td>Cedar Falls and Missouri</td>
<td>25.35</td>
</tr>
<tr>
<td>Chicago, Iowa, and Nebraska</td>
<td>82.11</td>
</tr>
<tr>
<td>Dubuque and Pacific</td>
<td>111.18</td>
</tr>
<tr>
<td>Dubuque, Marion, and Western</td>
<td>51.00</td>
</tr>
<tr>
<td>Keokuk, Ft. Des Moines, and Minnesota</td>
<td>92.00</td>
</tr>
<tr>
<td>Keokuk, Mt. Pleasant, and Muscatine</td>
<td>25.20</td>
</tr>
<tr>
<td>Mahaska County</td>
<td>12.00</td>
</tr>
<tr>
<td>Mississippi and Missouri with branches</td>
<td>187.63</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>679.77</strong></td>
</tr>
</tbody>
</table>

Iowa, meantime, was growing in importance as a source of breadstuffs, both for home and foreign markets. Wheat was the chief export. With Michigan and Wisconsin, Iowa was described by the superintendent of the census as "the granary of Europe." 23 England and Ireland were the chief markets, English imports having increased perceptibly since the repeal of the Corn Laws in 1846. 24

The East, too, provided an extensive market for wheat.

---

The states of Pennsylvania, Vermont, Delaware, New Jersey, Maryland, Virginia, and North Carolina, which had exported grain, now turned from agriculture to manufacturing; and by 1860 they were dependent on the West for their supply of breadstuffs. 25

The West had, by 1860, become the surplus wheat producing region, supplying not only New England but also western Europe. 25

Finances

The financial condition of Iowa in 1860 was generally unfavorable. Failures had followed the panic of 1857, and debts incurred during flush times had not been paid. Poor crops and a cold, wet season had come in 1858. There was inefficiency in tax administration and collection. Agricultural prices were low, freight rates were high, because rail transportation was inadequate, and there was little real money in the hands of the people. Delinquent taxes had doubled in four years. In 1857 they amounted to $31,311.39; in 1858, $27,441.52; in 1859, $30,524.56; and in 1860, $68,178.78. 27

Furthermore, the state was being flooded with bank notes issued under the free banking systems of Indiana.

26. Ibid., p. xliii.
Illinois, and Wisconsin. These notes were issued on the security of United States or State bonds, deposited with a certain state official. Often these notes were based on the depreciated southern bonds. The maintenance of an adequate specie reserve was not demanded so that notes could be redeemed when they were presented. 28

From 1846 to 1858 Iowa was without an authorized state bank. The Miners' Bank of Dubuque had been incorporated in 1836, approved by the territorial legislature, and its charter amended and affirmed by Congress in 1837. The bank, however, never did a very large business, partly because of the panic of 1857 and the ensuing depression. Its charter was repealed in 1846 on grounds of poor management and fraudulent capitalization. 29

The Constitution of 1846 forbade the establishment of banks. 30 Unauthorized private banks sprang up, however, for economic development made some system of banking a necessity. They usually were connected with some other business at first, gradually assuming more power and capital. The National State Bank of Burlington, established in 1842, claims to be the first bank. 31 Most of the banks were established after the charter of the Miners' Bank had been withdrawn.

30. Code of Iowa, 1851, p. 373.
31. Preston, op. cit., p. 49.
The constitution of 1857 provided that a state bank with branches might be established under certain restrictions; and such a bank was incorporated in 1858. It was not a bank of issue and deposit. It transacted no business except with branch banks of which no more than thirty might be organized. The main bank was located in Iowa City. By 1860 twelve banks and branches had been established.32

Two land acts passed by the U. S. Congress were important for Iowa. The land act of 1820, with its primary object of getting the western lands into the hands of actual settlers as speedily as possible, reduced the price of land to $1.25 per acre, and purchasers were allowed to buy as little as 80 acres. Payments were to be made in cash. All that a settler had to do to establish ownership over a tract of land, which he claimed, was to file a claim in the district land office thirty days after settlement, and appear in the office not more than a year later to prove actual residence on the land. Payment completed title to the property.33 The land act of 1820 was a turning point in the federal land policy; from then on an increasing emphasis was placed on adjusting the land laws to the needs of the settlers.34

33. Iowa board of Immigration, op. cit., p. 23.
A further development in the land policy which was of more consequence to Iowa was the Preemption Law of 1841. This law granted to squatters, or unauthorized settlers on public lands, the right, when such lands were opened to entry, to purchase at the minimum price in advance of public sale, thus affording protection against the competition of speculators. The Preemption Law established the principle that the actual settler should have precedence over all other purchasers.

Besides the sales of land provided on such generous terms by the national government, extensive grants were also made to the states. Iowa was given 500,000 acres on admission to the union. Other grants included swamp and overflowed lands; 2,431,541 acres for railroads; and not more than twelve saline or salt springs, comprising in 1856 46,101 acres with six sections of land contiguous to each to be sold and the proceeds used as the state legislature directed. The state was granted on November 19, 1859, 45,958 acres for a state university with branches in Iowa City, Fairfield, and Dubuque. By an act of May, 1856, the state made the following grants to railroads:

<table>
<thead>
<tr>
<th>Railroad</th>
<th>Acres</th>
</tr>
</thead>
<tbody>
<tr>
<td>Burlington and Missouri</td>
<td>227,000</td>
</tr>
<tr>
<td>Mississippi and Missouri</td>
<td>474,675</td>
</tr>
<tr>
<td>Iowa Central</td>
<td>775,095</td>
</tr>
<tr>
<td>Dubuque and Sioux City</td>
<td>1,226,559</td>
</tr>
</tbody>
</table>

35. Ibid., p. 154.
The railroads later sold those lands to the settlers retaining such as were necessary for the maintenance of their property. Total land grants of Iowa constituted 7,276,945 acres. 37

A survey of land development in 1860 in Iowa shows:

<table>
<thead>
<tr>
<th>Total number of farms</th>
<th>61,163</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acres of improved land</td>
<td>3,792,792</td>
</tr>
<tr>
<td>Acres of unimproved land</td>
<td>6,277,115</td>
</tr>
<tr>
<td>Area in square miles</td>
<td>55,045</td>
</tr>
<tr>
<td>Number of inhabitants per sq. mi.</td>
<td>12</td>
</tr>
<tr>
<td>Cash value of farms</td>
<td>$119,899,547</td>
</tr>
<tr>
<td>Value of farm implements and machinery</td>
<td>5,327,033</td>
</tr>
<tr>
<td>Value of livestock</td>
<td>22,476,292</td>
</tr>
</tbody>
</table>

Organizations

There was still a decided reluctance on the part of farmers to apply scientific principles to farming. It was easier to acquire more land than it was to improve the old; and in this respect the federal and state land policies fostered a system of extensive but comparatively poor cultivation. Knowledge of the treatment of the soil was meager; but worse yet, there was a distinct aversion to any scientific farming which would indicate the appearance of book knowledge. Each farmer preferred to rely on his own methods and resources. 39

37. Shambaugh, Benjamin, The messages and proclamations of the governors of Iowa, III:287.
Legislation for the promotion or regulation of agriculture was likewise of small consequence, both because it was meager and because improvement developed not with legislation but with the growth of markets. Legislation assumed two forms: that primarily educational; and that primarily protective. Educational laws provided for the establishment of county agricultural societies, fairs, and exhibitions, and a college. Protective laws included provision for fences and hedges, and for the non-importation of diseased stock.

The first law concerning agriculture in Iowa was passed by the first legislative assembly of the territory of Iowa, and provided for the incorporation of agricultural societies, consisting of at least twenty members each, encouraging agriculture and stock raising, and awarding prizes. In 1842, $1,000 was appropriated for division among the societies for awards. Societies, when they had raised $25 for agriculture, were entitled to a like amount from the state treasury; but they could not obtain more than $50 a year. In 1853 this amount was increased to $200. In 1857 county organizations were subjected to these regulations:

1. The awarding of annual premiums for improvement of stock, tillage, crops, mechanical fabrics, articles of domestic manufacture, and such others as may be deemed proper.

41. Iowa third general assembly, 1850. Laws, p. 171; Iowa fourth general assembly, 1852. Laws, p. 73.
2. The regulation of premium awards in such a way that small as well as large farmers might compete.

3. The publication of reports, awards, lists of rules, and officers.

A state society and agricultural fair was the direct outgrowth of agitation among leaders in the southeastern part of the state. In 1853 Jefferson County called a meeting to organize a state agricultural society and offered grounds for the first exhibition. A society was launched in December of that year, and the first fair was held in Fairfield in 1854.

The state fairs were as a rule of more value than the county exhibits, because they drew larger crowds, traveled from city to city as inducement warranted, and were better equipped. The fairs were primarily educational. Cattle exhibition and judging was the central feature. Combined with that were suggestions for improvement and a discussion of the reasons for the awards. Evening meetings of the fairs consisted of interesting, if often heated, informal discussions.42

The state agricultural college, located in Story County, was established by an act of 1858. It characterized the institution as a State "agricultural college and model farm, to be connected with the entire

agricultural and mechanical interests of the state." The college was not opened, however, until late in the decade of the sixties.

In 1860 Iowa had one agricultural publication, The Iowa Homestead and Western Farm Journal, established in 1855. It had a circulation of 9,000, and was published once a month. At the same time Iowans were contributing articles to several eastern publications, including the American Agriculturist, The New England Farmer, and The Country Gentleman. The New York Daily Tribune provided regular departments for the correspondence from Iowa.

Reports of the state and county agricultural societies were published and circulated. Through them the farmers obtained adequate crop information. Besides this, the secretary of the state society encouraged the writing of essays on farm problems, experiments, and results, and he published them as a distinct part of his annual report.

II

CROPS AND FARM MACHINERY

General Conditions During the Decade

The agricultural situation in Iowa in 1860 looked most promising. Development in all lines of agriculture, industry, and manufacturing had progressed rapidly, especially during the fifties; and the settlers, despite temporary reverses in the latter part of the decade, were quickly recovering and extending their crop production.

The outlook for agriculture, however, changed considerably during the year, and up to the opening of the war in 1861. The crop yield of 1860 was enormous, but when marketing facilities were hampered the situation became serious. The difficulty centered around the river. The sympathies of the people were unquestionably with the north, despite the early preponderance of southern emigrants who had found their way up the Mississippi River. In the course of the fifties immigration from the northern states and from Europe changed Iowa from a southern to a northern state.44 Even so, the South hoped that Iowa would find a

southern rather than a northern alignment more profitable because of the dependence of transportation on the river as an outlet to the markets.

With the closing of the river, produce was shipped by rail to Chicago, which was fast becoming the market of the middle west. But inadequate facilities (the railroads had developed primarily as feeders for the rivers) and a large surplus hindered marketing. Produce could not be handled either easily or effectively, and as a result prices went down while freight rates increased 30 or 40 percent.\(^45\) If the crops of 1861 could have been sold at a normal price, a general prosperity would have existed. As it was, they brought approximately half the 1860 price.\(^46\) By 1862 the cost of carrying grain to market was in some cases three times as much as the cost of growing it.\(^47\) Such a condition led to the extensive use of corn as a fuel.

The years 1862 and 1863 were particularly favorable to crop production. Sometimes weather conditions were not always the best, but throughout the state in general a considerable degree of prosperity existed. A year later crops were even better, the reward was more remunerative to the tiller, and better market facilities existed than had for some years past. Attention was partially diverted, moreover, 

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\(^45\) Iowa state agr. soc. report, 1861, p. 7.
\(^46\) Ibid., p. 3.
\(^47\) Ibid., p. 126.
from almost pure tillage to grazing; and increased attention was given to improved breeds of livestock, to the use of machinery, and to the improvement of farms and buildings. Late in the year a raid of grasshoppers came from the west, too late to damage the crops of that year. The next spring, however, their hatched larvae left the territory, especially that around Sioux City, practically stripped. A more serious plague came two years later when not only grasshoppers virtually laid waste some regions, but when chinch bugs, potato beetles, and canker worms also ravaged the state. In some cases they came too late to injure the essential products; in others they missed parts of the state, so that production was not materially decreased. But some places were so completely stripped of vegetation that food had to be brought from other parts of the state.

At the close of the decade a general survey of agriculture showed, in the main, improvement. While there had been excessive rains at harvest time, inferior grades of some crops, and destruction through early frosts, there was no outstanding loss from insects. Furthermore, diversity in farm products, which had been one of the outstanding needs of the state, had been attempted, and showed remarkable progress.

48. Ibid., 1864, p. 3.
49. Ibid., 1867, p. 7.
50. Ibid., 1869, pp. 5-6.
Grains and Cereals

Iowa had two staple crops, wheat and corn. Both were referred to, at some time during the period, as "the staple". However, more prominence as such was given to wheat because of its necessity in making breadstuffs.

Wheat, like the other crops, was above the average in 1860, following closely upon a production below normal and aggravated by the increase in foreign demand. The next year, with abnormally high freight rates and adverse weather conditions, cultivation was substantially abandoned throughout the state. Some acres raised in the southeastern counties did well; but the spring wheat crop was materially short, averaging fourteen bushels to the acre.51

During the middle of the decade production increased generally. In 1863 it was increased fifty percent, while all other crops showed a deficiency; and in 1866, though the secretary of the State Agricultural Society regretted that so little good farming was evidenced in the raising of wheat, especially since it was sown on corn land without plowing, nevertheless he was most gratified that Iowa had exported more than one-third of the 11,960,991 bushels received at the Chicago market.52 He wrote, "Deducting what was con-

51. Ibid., 1861, p. 6.
52. Ibid., 1866, p. 17.
sumed by the mills on the Mississippi, and at other points, it is within bounds to estimate that our young State furnished one-third of all the wheat sent to that greatest grain market in the world. This fact must be gratifying to every one who feels a just and honest pride in the rapid progress of Iowa in the path of empire."

In 1867 Iowa again furnished one-third of the Chicago receipts of wheat - 6,539,628 bushels out of 18,090,868. Profits were large, and there developed a tendency to waste the soil through careless plowing and planting; and to impoverishment through failure to rotate the crops. In this year the secretary predicted that "with a good crop, Iowa alone can raise wheat sufficient for the whole country." A year later, however, with still further production, he recommended that in view of the declining price, wheat raising should be left to the pioneer on the new soil and to the farmers near the railroads.

The decade closed with an almost negligible crop, damaged or ruined by excessive rains just at harvest time. Meantime, ruling high prices earlier in the decade had resulted in increased planting and in the contraction of debts for reaping machines to harvest a crop which eventually was harvested with the old fashioned cradles. Necessity clearly

53. Ibid., 1867, p. 15.
54. Ibid., p. 16.
55. Ibid., 1868, p. 20.
showed that too much emphasis should not be placed on wheat alone, but that agriculture should be diversified. 56

Reports from the various county agricultural societies through the state showed a preference for Canada Fife, White Mediterranean, or Rio Grande wheat. Canada Fife was by far the most common. Spring wheat was planted all over the state, but winter wheat was also common in the southern counties.

In the essays sent to the State Agricultural Society there were several during the decade on the conditions of wheat cultivation: whether the land should be deep- or shallow-plowed, drained, or fertilized. Some of the writers thought that with land taken up as recently as it was in Iowa, fertilization and rotation were unnecessary. Emphasis was placed on the quality of the seeds used. During the decade production rose from 8,449,403 bushels to 39,435,692 bushels; and Iowa rose in rank from eighth to second place. 57

Corn, the other staple crop, was also called the king cereal of the country. 58 At all times during the decade its production surpassed that of wheat. The decade opened with a yield of 42,410,686 bushels, with Iowa ranking seventh among the corn-growing states. By 1870 the crop had increased to 68,935,065 bushels, and the rank to second place. Illinois was first. 59

There was a fine crop of this cereal in 1860. In 1861

56. Ibid., 1869, p. 15.
57. Hull, op. cit., p. 66.
58. American Agriculturist, 26:277, 1867.
59. Hull, op. cit., p. 64.
it assumed preeminently first place; and in 1863 it was called the great staple of the state, and it deserved such recognition, with a yield of 63,883,916 bushels and an average of forty bushels to the acre.\textsuperscript{60} The price that year was three times as great as it had been the previous year.\textsuperscript{61} Exports of the year, over four railroads, totaled 621,431 bushels.

In 1864 it was still the principal crop, though the acre average had fallen to thirty-six bushels. Iowa furnished one-tenth of the corn crop of the United States,\textsuperscript{62} though a very small quantity of it was shipped in the bulk. By far the larger percentage of it went as pork or beef.

Two years later there was a general shortage in crop production which indicated the necessity for shifting attention from the one- or two-crop system of cultivation. Then the editor of the American Agriculturist noted the fact that western farmers cultivated too many acres of one product.\textsuperscript{63} Such advice apparently went unheeded, for in 1868 the area of corn planted was the highest it had ever been. Meantime, however, there was a particular interest in corn raising because of the contemporaneous development of the livestock industry.

The farmers seemed to think that with rather careful

\textsuperscript{60} Iowa state agr. soc. report, 1863, p. 5.
\textsuperscript{61} Ibid., p. 5.
\textsuperscript{62} Ibid., 1865, p. 13.
\textsuperscript{63} American Agriculturist, 24:246-247, August, 1865.
plowing and planting of their corn fields they could average 30 to 50 bushels per acre. Again the secretary of the State Agricultural Society cautioned them. He maintained that with any degree of care they could raise 100 to 150 bushels to the acre; and he decried their methods, both because they were exhaustive to the soil, and because corn would have to remain the principal source of revenue. 64 By the end of the decade there were 221 varieties of corn in use. The two preferred varieties were the red and yellow dent.

Oats, barley, buckwheat, and rye, though showing a steady increase in acres planted and bushels raised, remained as secondary crops. Most of them were used as hog or stock feed, and rye was also used to a considerable extent in the manufacture of liquor. As late as 1867 in thirty-seven counties reporting, seventeen indicated that little rye was raised, and seven said that none was raised. In the same year in thirty-four reporting on barley, fourteen reported that there was little raised and in seven there was none. The average yield per acre was thirty bushels. 65

In 1860, with a total grain yield of 57,613,564 bushels, these four grains produced only 6,753,475 bushels, or 11 percent. The remaining 89 percent were wheat and corn. By 1870 the percentage was a little higher, 23,581,160

64. Iowa state agr. soc. report, 1865, p. 13.
65. Ibid., 1867, p. 20.
bushels out of 121,951,917.

There was considerable fear expressed, when the war broke out, that the rapid and extensive enlistment of men from the state of Iowa would seriously interfere with crop production. If it did not interfere directly with the planting of the fields, most certainly it would decrease the available help in the harvesting.

No unusual upset in the labor supply was noticeable at all during the war. Help was recruited from the women and children. More important, however, was the introduction and extensive use of improved and labor saving machinery. The war seemed to stimulate an unprecedented interest in machinery, and its adoption in Iowa was extensive.66

As soon as the state began to pay more attention to grazing, there was more interest shown in the production of grasses and hay. Hungarian grass was highly recommended as a feed, both because it spread rapidly and because it

<table>
<thead>
<tr>
<th></th>
<th>1860</th>
<th>1862</th>
<th>1864</th>
<th>1866</th>
<th>1868</th>
<th>1870</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wheat</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acres</td>
<td>8,449,403</td>
<td>8,795,321</td>
<td>8,284,565</td>
<td>14,635,520</td>
<td>17,963,555</td>
<td>29,435,692</td>
</tr>
<tr>
<td>Bushels</td>
<td>1,149,837</td>
<td>964,452</td>
<td>1,057,330</td>
<td>1,804,504</td>
<td>1,804,504</td>
<td></td>
</tr>
<tr>
<td>Corn</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acres</td>
<td>42,410,686</td>
<td>63,883,916</td>
<td>48,471,183</td>
<td>56,928,958</td>
<td>76,507,576</td>
<td>68,935,065</td>
</tr>
<tr>
<td>Bushels</td>
<td>1,733,503</td>
<td>1,727,777</td>
<td>1,992,326</td>
<td>2,058,239</td>
<td>2,500,000 est.</td>
<td></td>
</tr>
<tr>
<td>Oats</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acres</td>
<td>5,887,645</td>
<td>7,582,060</td>
<td>15,928,777</td>
<td>15,861,494</td>
<td>18,596,625</td>
<td>21,005,142</td>
</tr>
<tr>
<td>Bushels</td>
<td>336,137</td>
<td>517,540</td>
<td>657,007</td>
<td>700,000 est.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Barley</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acres</td>
<td>467,103</td>
<td>385,067</td>
<td>950,696</td>
<td>1,197,729</td>
<td>1,144,454</td>
<td></td>
</tr>
<tr>
<td>Bushels</td>
<td>18,679</td>
<td>51,814</td>
<td>48,013</td>
<td>49,607</td>
<td>52,000 est.</td>
<td></td>
</tr>
<tr>
<td>Buckwheat</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acres</td>
<td>215,705</td>
<td>155,914</td>
<td>233,714</td>
<td>37,971</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bushels</td>
<td>15,999</td>
<td>298,646</td>
<td>496,347</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rye</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acres</td>
<td>183,022</td>
<td>474,675</td>
<td>662,388</td>
<td>492,284</td>
<td>496,347</td>
<td>505,807</td>
</tr>
</tbody>
</table>

Statistics for all of the years are not available. These figures are from Hull, op. cit., pp. 179-183, 278-305.
was well adapted to the prairies. When the Hungarian grass plant was first brought into Monroe County in 1860, it received an unusual degree of attention. The praise which accompanied its use, carried through the reports of the county agricultural societies, led to its extensive introduction into other counties. By the mid-decade it had increased in cultivation by almost 70,000 acres; and then as rapidly its importance waned. Some of the farmers discarded it entirely within four or five years. They claimed that it was too hard on the soil, and that it was troublesome when it was followed by hoed crops. Some also thought that it tended to act as a poison to their animals, especially the horses. By the end of the period it had ceased to be even moderately used. No doubt the rapid expansion of acreages in corn and the lesser cereal crops lessened its importance as a stock feed. 67

Supplemental Crops

Besides the regular grain crops which were accorded their share of attention at this time, experiments were conducted in the raising of crops whose importation was checked by the war. These concerned sugar, tobacco, flax, and hemp. The experiments with them, however, did not assume any great importance, and in most cases their culti-

vation terminated with the reopening of trade relations with the south. The most interesting experiment, of course, was that with sorghum. Attempts were made to manufacture sugar and syrup from the sorghum cane.

Sorghum syrup was first brought to the notice of the people of the state when some of it was exhibited at the Muscatine fair in 1856. At that time it was regarded as a curiosity. Two years later about one farmer in twenty was experimenting with a few hills. To encourage its cultivation, premiums were offered by the state agricultural society both for syrup and for sugar.

In 1860 the state society increased the inducements for raising sorghum. Its efforts were certainly fruitful, for during the year sorghum cane was introduced into every county of the state, and its reception was everywhere hailed with enthusiasm.

During the first two years of the period nearly every county raised enough sorghum for home consumption. In some there was an insufficient supply. Production exceeded a million gallons, and in nineteen counties sugar was being made in small quantities. Iowa, with 3,996,948 gallons of syrup in 1862, among ten midwestern states, was surpassed only by Ohio, rating above Illinois, Indiana, Kansas,

68. Ibid., 1861, p. 8.
69. Ibid., p. 9.
70. Ibid., 1862, p. 129.
Michigan, Minnesota, Missouri, Wisconsin, and Pennsylvania. In 1864, 21,469 pounds of sugar were made, but even then some of the people had had poor enough crops to wonder whether the soil was really fitted for its cultivation.

Most of the doubt on the subject came from the impossibility of making a merchantable sugar. The machinery that had been set up for manufacturing it left the sugar sticky and with the taste peculiar to sorghum too noticeable. Some counties had ceased to raise it at all, and others scarcely mentioned it as an important branch of agriculture. By 1865 the interest in it revived somewhat, new mills had been opened, manufacture was better understood, and the crop yield was good. Still the manufactured sugar was not usable except in the home. Many denied that good sugar could be made from the cane, and said that what was made was the result of accident rather than of system.

It is interesting to note how the editor of the American Agriculturist, Orange Judd, rated the importance of sorghum. In the issue for July, 1864 he said that it was not worth while to make sugar from sorghum, for its value on the market was not so high as that for the syrup. The sugar, he said, was a gummy mass which might be washed so as to leave some of the crystals free; but while it was all right for family use that it was not marketable.

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73. Ibid., 1867, p. 18.
Two years later he wrote, "We know of no other crop ever having been introduced among agriculturists which grew so rapidly in popularity as has the Sorghum." And by 1869 he was writing, "Iowa should make its own syrups and sugars, and farther than that, it should afford large quantities for export. And this can be done, and will be done, so soon as the sorghum crop receives the same attention as corn and wheat."76

There was some difficulty in raising sorghum at first, and that probably accounted for the necessity of the use of premiums to inaugurate its cultivation. High rolling timber soil was found to be preferable to now soil. It had to be plowed deep and pulverized. The seed was planted at least three or four weeks before it showed itself above the ground. Best results followed the soaking of the seed, and its planting in hills two or three inches apart. Four feet was found to be the best distance between rows. If the cane was harvested while it was still in bloom, the syrup made was probably a little better, though there was always left in it the cane taste.77

Table II shows the extent of sorghum cultivation.

75. Ibid., 25:316, September, 1866.
76. Ibid., 28:17, January, 1869.
### Table II

**EXTENT OF SORGHUM CULTIVATION**

<table>
<thead>
<tr>
<th>Year</th>
<th>Acres</th>
<th>Gallons Syrup</th>
<th>Gallons Sugar</th>
<th>Value</th>
<th>Pounds Sugar Per Acre</th>
<th>Value</th>
<th>Pounds Sugar Per Acre</th>
</tr>
</thead>
<tbody>
<tr>
<td>1858</td>
<td>5,606</td>
<td>410,776</td>
<td>74</td>
<td>$37</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1859</td>
<td>26,866</td>
<td>1,993,474</td>
<td>92</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1862</td>
<td>37,607</td>
<td>3,442,396</td>
<td>92</td>
<td>46</td>
<td>21,469</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1864</td>
<td>21,452</td>
<td>1,543,604</td>
<td>67</td>
<td>41</td>
<td>8,386</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1866</td>
<td>25,796</td>
<td>2,090,557</td>
<td>81</td>
<td>57</td>
<td>14,697</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1868</td>
<td>26,243</td>
<td>2,592,393</td>
<td>99</td>
<td>74</td>
<td>16,500</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1870</td>
<td>27,000</td>
<td>2,979,480</td>
<td>110</td>
<td></td>
<td>1,500&lt;sup&gt;78&lt;/sup&gt;</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Little attention was paid to the raising of tobacco before the outbreak of the war. High prices during the rebellion, and a fear that the supply would be cut off stimulated the planting of tobacco. In 1860 there were 312,919 pounds raised, and by 1863, though 2,000,000 pounds was estimated as the yield, the actual crop was only about 300,000 pounds. Difficulty of seed germination, poor seeds, droughts, and frost had successfully ruined it.

Its returns were greatest in 1863, when 517,194 pounds were raised.

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<sup>78. Iowa state agr. soc. report, 1867, p. 18, contains summary for 1853, 1859, 1862, and 1864; for 1866 and 1868; Iowa 12th general assembly, 1868. Legislative documents. Report of the census, p. 79; 1870 in compendium of the ninth U.S. census, p. 702. Iowa and Pennsylvania were the only two states reported by the ninth census as making sugar from sorghum. Pennsylvania made 900 pounds.</sup>
raised, and in 1865 when 753,626 pounds were raised.79
By 1870 only 71,792 pounds were grown.80

Flax was raised primarily to take the place of southern cotton. Early in the decade its cultivation was urged because of the chemical value of its mixture with cotton, and even the possibility that it might supersede that commodity. The cost of raising it was figured as $5 an acre, with harvesting, handling, and threshing it costing an additional $2. The straw alone was valued at $5 a ton, and additional profits accrued from the fiber, the seeds, and the linseed oil.81 In 1867 the area of cultivation, the bushels of seed obtained, and the pounds of lint were slightly below those of 1865, but at the close of the period there was a revived interest in flax culture.82

Most of the attempts to replace cotton with flax were unsuccessful. The machinery, previously considered to be adequate, failed to separate the fibers sufficiently, and not until corrections had been made in it did the replacement of one plant with the other proceed.

Iowa was asked by the U. S. Department of Agriculture in 1863 why she did not start raising hemp. It was confined mainly to Kentucky and Missouri, but this state had

80. Ibid., p. 185.
81. Iowa state agr. soc. report, 1860, p. 120.
decided advantages over the other two; a colder climate, pure water, and soil equal in fertility to any on the globe. A negligible interest in it was the only outcome of the suggestion.

Root Crops

Simultaneously with the increased attention paid to the livestock industry which developed in such leaps and bounds through the decade was an increased production of root crops - carrots, turnips, rutabagas, and cabbage for feed. The consensus of opinion had been, earlier, that if the stock wintered successfully, there was consolation and effort enough for the farmer.

Scientific experiment showed that animals needed the juices which they could extract from the roots if they were to thrive. In 1863 the United States Department of Agriculture called attention to the fact that root crops were important, and urged an expansion of their cultivation. The American Agriculturist continued the agitation, and gave as reasons for the use of roots as staples for animal feeding that the animals thrived better on a mixed diet and that more food per acre could be obtained with them than with any other crop.

84. Ibid., p. 95.
Some expansion of cultivation of this crop was recognized through the decade. But again, a report from Linn County as late as 1870 stated that one man knew "of no one hereabout who raises roots for stock" except himself. Thus root crops, like so many other crops used during the decade, were limited to certain counties and to certain farmers.

Fruit

Even after 1860 the people continued to think that Iowa was not a fruit-growing state. Early experiments in fruit raising had been quite unsuccessful, and they assumed the reason was that the climate was too cold. What attempts had been made had resulted almost entirely in failure. It must be said, however, that such failures were not caused by the climate, but by the lack of knowledge and care on the part of the grower.

By the middle of the decade a distinct interest in fruit growing had been developed, and all over the state men were sending to the U. S. Department of Agriculture, or to the state society, for seeds or for trees. The idea that Iowa was not adapted to fruit had been entirely disproved, and the state was rapidly being planted with fruit.

trees. In 1865 there were 636,458 trees bearing fruit, and 2,523,905 more trees had been planted. 87

At this time an interest in grape culture swept the state. Agricultural and horticultural papers engaged in the discussion of its worth, and the daily papers filled their columns with it. The chief varieties grown were the Concord and the Delaware; the Concord was everywhere given preference. 88 Practically all types of fruit were raised in the state. Peaches and pears did well in the southern part; cherries and plums were grown in most of the counties; and apples were the king of them all. 89 By 1869 orchards were being planted with a rapidity never before known. When once enthusiasm had been aroused, it seemed never-ending. The year 1870 was not so favorable to the enterprise. Most crops were poor, and those that were not injured by the droughts were damaged by the hordes of insects which infested the state. 90 But ardor in the subject did not wane. Attention was also given to the smaller fruits and berries: strawberries, raspberries, currants, gooseberries, and blackberries.

87. Ibid., 1865, p. 7.
88. Ibid., 1868, Horticultural section, p. 70.
89. Ibid., 1870, p. 81.
90. Ibid., 1869, p. 5.
While the extension of the livestock industry was absorbing more interest, another necessity confronted the pioneer farmer: he had to provide some means of fencing in his stock. This problem, like others arising during the decade, had its difficulties. One of the correspondents to the state agricultural report said that the cost of fencing was too high, and that keeping up the repairs and interest on the investment exceeded the annual sales of cattle and hogs by $138,000. Other writers insisted that, with the average cost of $320 for 40 acres, it was cheaper in the long run to hire someone to shepherd the animals than to construct fences. Some criticized the making of fences because of the shortage of timber, which was further being cut by the railroads. Again they decried the fact that there was no good substitute for the wood fence.

The use of the Osage orange became popular as a hedge about this time. At first it was neglected and ill-cared for, so that its general adoption was quite slow. Those who did plant it expected that once it was in the ground, Nature would do the rest. Those who found

92. Ibid., Horticultural section, 1868, p. 69.
its use costly did not see that a little care on their part would have made its use more satisfactory.

Sometimes the honey locust was used instead of the Osage orange. Objections to it were that it was naturally a tree and could not be cramped into a hedge plant. The same was true of the Osage orange, but apparently that was not considered. The hawthorn, or buckthorn, met the same response. The search for a hedge which would be just the right size without any attention or care was useless. "Even the Beech may be grown as a hedge, if properly clipped." 93

For fencing around the house, before the introduction of steel fencing, more grove trees were planted: the big willow, cottonwood, and evergreen, which were most often selected. Once an interest in them had been aroused, the acreages of groves planted increased. Further than that, lands used for hedging and the planting of forest and orchard trees were exempt from taxation. 94

With the horticultural interests stimulated, attention was quite naturally manifested in bee culture. Italian bees, which were found to be the most satisfactory, were brought into the state and hundreds of hives were set up. Production of honey for the various years of the decade is shown in the following table:

Farm Machinery

Farm machinery was yearly being improved. Though the decade had started with a considerable amount of machinery in use, the steady adaptation of it did not lag. In 1861 there were more than 280 inventions of farm machinery, including 25 pertaining to bee hives, 53 cultivator patents, 9 seed drills, 60 plows and appendages, 37 seed planters, and 97 harvesters, mowing machines, and reapers. It is noticeable that all of these inventions were designed primarily for the West. Sugar separators, wine presses, horse rakes, and portable engines appeared on the market with the increased demand for them.

Even the uncertainty of business during the war did not diminish the output nor the purchase of machinery. There was probably an increased demand for the commodities, for

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of Hives</th>
<th>Pounds of Honey</th>
</tr>
</thead>
<tbody>
<tr>
<td>1860</td>
<td>84,731</td>
<td>919,750</td>
</tr>
<tr>
<td>1862</td>
<td>87,118</td>
<td>1,052,685</td>
</tr>
<tr>
<td>1864</td>
<td>85,727</td>
<td>1,128,339</td>
</tr>
<tr>
<td>1866</td>
<td></td>
<td>896,745</td>
</tr>
<tr>
<td>1868</td>
<td>82,517</td>
<td>639,717</td>
</tr>
<tr>
<td>1870</td>
<td></td>
<td>853,213^95</td>
</tr>
</tbody>
</table>

95. For 1860, Prelim. report of the U. S. census, p. 209; for 1862, Iowa legislative documents of the 10th general assembly, census report, 1864, p. 81; for 1864, 1866, and 1868, Iowa leg. doc. of the 13th general assembly, census report, 1870, p. 99; for 1870, compendium of the ninth census, p. 704.
the labor supply had been decreased and the need for a larger production created. Demand for machinery came, too, from the agricultural press, which urged the substitution of machine for hand labor. 96 The pages of the agricultural periodicals were full of advertisements for machinery.

"No improvement in modern husbandry has been more marked and rapid than that effected by the invention and introduction of mowers and reapers," reported the secretary of agriculture in 1862. 97 The trend had indeed turned toward scientific and more intensive farming.

EXTENT OF IMPROVEMENT

It was in livestock and animal products that the most important and far-reaching experiments of the decade were conducted. These experiments were important not only because of the actual improvements made during the course of the ten-year period, but also because they showed a distinct tendency on the part of the Iowa farmer to diversify his agriculture. It has already been noted that the secretary of the Iowa Agricultural Society continued to warn the people against the reliance on a one-crop system of farming; and in this case there was proof that livestock was soon partially to supplant grain raising. Later, however, those who let their enthusiasm for livestock raising absorb their attention were reminded that they were neglecting crops which were also important. By the close of the decade Iowa had taken an outstanding place in both branches of agriculture; and although livestock production subordinated grain raising, the two tended through their dependence on each other to develop simultaneously.
Before the Civil War the improvement of domestic animals had been "one of the most important, and to a large extent, one of the most neglected branches of rural economy."\textsuperscript{98} The fault had not been that the farmers did not keep enough stock, for often they kept more than they could feed profitably. The difficulty was that they failed to take proper care in the selection of animals for breeding, and to appreciate the value of obtaining better animals with which to breed.\textsuperscript{99}

For some reason, too, the attitude of the Iowa farmers was that of quantity rather than quality. A man might have a considerable herd of farm stock, but whether it was composed of blooded animals or not made no apparent difference to him. He could not see that by improving the general standard of his animals he would ultimately gain by the larger expenditure of money. Even when a few of the more progressive men in the state imported blooded stock from Europe, their purchases were looked upon as curiosities rather than as examples to be followed. Moreover, the average farmer made little or no effort to protect his animals. "The only barns, with few exceptions, are poles or boards, forming a skeleton frame, covered with heavy masses of straw from the stacks, from the interior of which nearly all light and air are excluded, and in which horses, cattle, and sheep

\textsuperscript{99} Ibid., p. 224.
lie upon their filth, until the whole structure is a mass of rotten straw, mold, and reeking dampness. The business of stock raising will never be sufficiently extended or properly remunerative until some attention, some expense, is bestowed upon barns and cattle sheds."100

Diseases among farm stock were prevalent at all times, though of course more pronounced some years than others. The causes of disease in several cases have been mentioned: the lack of adequate feeding, shelter, or care. Again, diseases in cattle were often carried by animals imported from other parts of the country. Sometimes they were the result of eating or feeding smutted corn. Footrot in sheep, which was the major cause of the depletion of flocks, was usually brought in when importations were extensive. Hog cholera was present at nearly all times during the decade, and its existence was more pernicious because its cause and remedy were not known.

Thus it was that the secretary of the Iowa Agricultural Society waged his campaign for improvement. He divided his efforts between betterment of breeds and of care, though he paid more attention to the former. He began by scoring the farmers for their neglect of this phase of agricultural development, while he praised by name those who had attempted to increase their herds with blooded stock. All through the

decade he continued to promote interest and cooperation, but as late as 1867 he wrote with concern that Iowa had made but slow progress in the improvement of cattle. The use and distribution of better stock were confined to the few; and while the superiority of the better breeds was recognized, their care was crude and their cost high.\textsuperscript{101} The next year he noted that although improved stock was gradually gaining favor, there was still too much of a tendency to be satisfied with the present achievements.\textsuperscript{102}

Iowa as a state was particularly well suited to animal production. There were numerous small streams, plenty of timber, and the land was fertile. Crop cultivation was extensive, and although production was cut off somewhat by pests and poor crops, feed usually was plentiful. One notable exception should be made. In 1864 the west generally felt the pinch of a short corn crop. Hogs, especially, starved to death or were killed to prevent starvation. It was then that the use of compressed beef cakes and grains, especially rye, were suggested as overlooked sources of food.\textsuperscript{103} Iowa did lack, early in the decade, the conveniences incident to good connections with the eastern markets, especially in the western part of the state; but those drawbacks were quickly remedied with the increased railroad construction of the post-war period.

\textsuperscript{101} Iowa state agr. soc. report, 1867, p. 9.  
\textsuperscript{102} Ibid., 1868, pp. 13-14.  
\textsuperscript{103} American Agriculturist, 23:175, June, 1864.
The war slowed somewhat the process of farm development; but as soon as adjustments could be made, improvements also were made. Such improvements were not general throughout the state, but it must be emphasized that the setback and retardation resulting from the war were not the actual, or hardly the contributing, cause for failure to progress. That rested in the attitudes of the farmers themselves. By 1870, however, great improvement had been made; but better yet, a decided interest in the subject and method of improvement had been stimulated. Furthermore, the actual value of livestock had risen from $22,476,293 in 1860 to $82,987,133 in 1870.104

Cattle Raising

The farmer of Iowa turned to cattle raising as a well defined industry when the Civil War broke out in 1861. When the railroads to the east were choked with the additional traffic delegated to them with the closing of the Mississippi River, transportation became poor and often the cost of getting produce to market exceeded the cost of raising it.105 The editor of the Country Gentleman asked quite pertinently why the farmer insisted on raising grain when wheat was a drug on the market and stock raising

104. Hull, op. cit., p. 274.
would pay so much better. Farmers were urged to turn their attention to the production of meats, poultry, butter, cheese, and milk for market. And at last they did - when they were quite sure that their profit lay in supplying the needs of the army. When the declaration of war cut off the well developed market in the south, the price of cattle temporarily declined. By 1862 it resumed its high level, which was continued until after the war closed. Until 1868 the price fluctuated, varying from $2.50 to $7.00 per hundred in 1867 to $3.00 to $7.50 in 1868. After 1868 there was a comparatively steady rise until after 1870.

The early pioneer farmer raised cattle chiefly for his own use, so that he sought a dual purpose type. While the range was extensive, he often raised more cattle than his immediate needs required. With the drop in wheat prices, however, he decided that there would be more profit in stock raising, and consequently he turned his attention to the beef type, and, to a certain extent, to the better breeds. More attention was also paid to feeding, pasturing, and sheltering. Diseases were prevalent during the decade, and in 1867 the

110. Ibid., p. 90.
111. Ibid., p. 241.
state legislature, in an effort to stop the spread of Texas fever, passed a law which prevented the importation of any cattle from the south. 114

Gradually the marketing of cattle became more centralized in Chicago. The year of highest shipments was 1865, when 81,999 cattle were sent to that city. In the other years the shipments were: 1863, 68,976; 1864, 65,942; 1866, 73,203; 1867, 64,346; 1868, 82,321; 1869, 90,141; and 1870, 129,253. 115 Furthermore, the method of fattening the cattle for market changed. At first the custom had been to ship or drive the cattle to some nearby state, as Illinois, to fatten, for by so doing shrinkage on the drive could be averted. With increased railroad construction and improved transportation, that policy was ended, and the cattle were more easily and profitably fattened in this state. 116

Between 1860 and 1870 the number of cattle nearly doubled, rising from 540,008 head to 1,006,235 head. 117

Sheep Husbandry

Sheep husbandry was the branch of agriculture which showed the most rapid rise and decline during the decade. During the war the attention of the Iowa farmer was some-
what diverted from cattle as an enterprise to sheep. Wool was demanded for the army, and to supply the needs "every farmer became interested in sheep." Besides this demand, the supply of cotton from the south had been cut off, and some substitute for that commodity was imperative. Then, too, the fact that wool as a bulky article could be shipped to the east much more cheaply than other products was a consideration not to be taken too lightly by the average farmer. The estimated cost of freighting at any point 200 miles from Chicago to the sea coast on four of Iowa's leading exports was: wheat, 80 percent; pork, 30 percent; beef, 20 percent; and wool, 4 percent. Figures for the actual increase in both sheep raising and pounds of wool clipped show the interest which this industry commanded for the war years. In 1860 Iowa had 258,228 sheep and clipped 660,858 pounds of wool. By 1865 the number of sheep was 1,000,541 with a wool yield of 2,813,620 pounds.

The inducements to sheep raising as an industry, cheap lands, the lack of labor required, the high price paid for wool, cheap corn, and favorable conditions in the state aided in its adoption as a state interest. "No state east

120. Ibid., p. 260; Hull. op. cit., p. 362.
of the Rocky Mountains, in the same latitude, can produce wool cheaper," observed the editor of the Country Gentleman. 122 Active support of the industry was fostered by the state, especially through the efforts of Governor Kirkwood (1860-1864) when he proposed exemption from taxation for a period of five years of all sheep not exceeding fifty owned by any resident of the state, and the further exemption of all capital invested in the state in woollen manufactories. 123 Fostering of the industry to such a degree was interesting in view of the fact that sheep raising in Iowa had previously been declared most unprofitable. Failures had followed the attempts of the settlers to realize some profit from the business, and they had come to the conclusion that the state was not adapted to it. Throughout the fifties many large flocks had been brought into the state, but lack of experience on the part of the pioneers, speculation, lack of shelter, and want of knowledge permitted but one result. Consequently the interest temporarily declined, and was revived only when the war crisis placed a premium on the success of the business. 124 After 1863 "an unparalleled impetus was given to the importation of sheep, and the interest in this branch of husbandry forms an epoch in our history." 125

125. Ibid., 1864, p. 12.
Such an interest in sheep lasted only during the period of the war. In 1862 importation began in earnest, and in 1864 it reached its high point when ten times as many sheep were brought into the state as were taken out. Two years later Iowa was exporting ten times as many sheep as she imported.  

Exports and imports during the decade were as follows:

<table>
<thead>
<tr>
<th>Year</th>
<th>Imports</th>
<th>Exports</th>
</tr>
</thead>
<tbody>
<tr>
<td>1863</td>
<td>70,108</td>
<td>6,289</td>
</tr>
<tr>
<td>1864</td>
<td>159,519</td>
<td>16,585</td>
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<td>1865</td>
<td>33,116</td>
<td>20,755</td>
</tr>
<tr>
<td>1866</td>
<td>5,972</td>
<td>52,539</td>
</tr>
<tr>
<td>1867</td>
<td>4,368</td>
<td>30,461</td>
</tr>
<tr>
<td>1868</td>
<td>3,688</td>
<td>48,464</td>
</tr>
<tr>
<td>1869</td>
<td>1,371</td>
<td>57,825</td>
</tr>
<tr>
<td>1870</td>
<td>2,726</td>
<td>78,465</td>
</tr>
</tbody>
</table>

By 1867 most of the counties reporting to the Iowa Agricultural Society indicated discouragement and failure as a consequence of low prices and losses from footrot, scab, and other diseases. Many who had thought of making sheep raising a specialty had abandoned it altogether. The next year less than half the thirty counties reporting mentioned sheep, and only six gave a favorable report. They were Appanoose, Adams, Harrison, Marion, Mitchell, and Van Buren. The causes for decline throughout the state were similar to those of the previous year, with the

128. Ibid., 1867, pp. 12, 13.
129. Ibid., 1868, p. 17.
addition of ravages of dogs, the want of pasture, and the hard winters. At the close of the decade, of sixty-one counties reporting, twenty-one did not mention sheep, and only two of those which did were optimistic. Thirty-eight reported that production was decreasing, had been abandoned altogether, or was too unprofitable to continue. Many of the sheep were slaughtered for their pelts. The actual number of sheep in the state had increased more than three-fold in ten years: from 259,041 in 1860 to 855,493 in 1870.

The woolen industry fared better. In 1860 there were twenty-three woolen manufactories with an annual value of products of $847,251. By 1870 there were sixty-eight factories with an annual value of products of $1,561,341. Wool production had increased in the ten years from 660,858 pounds to 2,967,043 pounds. Manufacturing was encouraged by exemption from taxation, the policy which Governor Kirkwood initiated and which his successors tried to continue.

Meantime, however, Iowa wool growers had two serious obstacles to meet. Dogs inflicted an annual damage of thousands of dollars. In 1864, the year of greatest develop-

130. Ibid., 1868, p. 17.
The next year thirty-three counties reported a loss of 4,660 head. In 1859 a petition had been circulated for protection against dogs, but it was ridiculed and finally defeated. After the close of the eighth general assembly the Iowa Agricultural Society took up the agitation, and the ninth general assembly was swamped with petitions representing 53 counties, 13 agricultural associations, and 3,000 people. It enacted a law which required registration of all dogs, the killing of all those found molesting sheep, and the assessment of a $10.00 fine to any officer neglecting to enforce the law. Funds accruing were to be set aside for the use of the schools. The law took effect through publication. It was enforced in the cities, but the agricultural districts, for which it was intended, scorned it, and it was repealed in 1862 in a special session of the legislature.

The other obstacle was the lack of adequate protection of the industry by the national government. The Wool-Growers' Association was formed in southeastern Iowa in 1864 with the specific objective of petitioning Congress for protection by a tariff on woollen imports. A writer from Lee County said that without legislative protection

wool could not be profitable at the current prices.\textsuperscript{138} Through the efforts of the Association, its objective was attained, and a duty was placed on the foreign article.\textsuperscript{139} The Association did not disband at once, however; it continued its meetings to maintain an interest in wool growing.

The efforts of the sheep breeders were to obtain a finer wool and a heavier fleece. For this, they found the Spanish Merino superior to all other breeds of sheep,\textsuperscript{140} and experiments were conducted to make the sheep larger and the fleece heavier. Blooded animals were brought into the state, and more care was exercised in the purchase of flocks or single animals. The word of every sheep-peddler who insisted that his animals were blooded was taken with the proverbial grain of salt. When the interest in raising sheep for wool alone decreased somewhat, other breeds including the Cotswolds and Southdowns were introduced in a few counties for mutton.\textsuperscript{141}

Hog Raising

In no branch of agriculture was more improvement made than in hog raising.\textsuperscript{142} There were of course the usual discouragements and setbacks incident to any industry connected with farming, and with the short corn crop and high prices

\textsuperscript{138} U.S. dept. of agr. report, 1868, p. 43.
\textsuperscript{139} Ibid., 1864, p. 177; 1867, p. ix.
\textsuperscript{140} Ibid., 1864, p. 197.
\textsuperscript{141} Ibid., 1869, p. 542.
\textsuperscript{142} Iowa state agr. soc. report, 1868, pp. 15-16.
of feed in 1864, there was a growing feeling that with the additional work required for hogs over that needed for sheep, production would gradually be reduced.\textsuperscript{143} Hog cholera was present throughout the decade, and it gave the quack doctors excellent chances to sell supposedly positive remedies to some of the more gullible farmers. But the industry prospered nevertheless. Statistics for swine at the opening of the decade gave Iowa 934,820 head. Three years later, despite the extensive losses of 1852 (estimated at $200,000)\textsuperscript{144} production had increased to 1,743,366 head. In 1867 it had dropped temporarily to 1,620,089 head, but by the end of the decade it was 2,409,679.\textsuperscript{145} Many of the farmers made hog raising a specialty.

Hog raising developed because it was the most profitable way of getting rid of a tremendous corn supply with the best returns. In 1860 the price was $3.00 per hundred for hogs at any shipping point on the Mississippi River.\textsuperscript{146} By 1867 it had risen to between $5.50 and $7.35; and by 1870 the price was between $8.00 and $10.00.\textsuperscript{147} Slaughtering and packing plants had increased to ten, with an annual value of products of $1,190,400.\textsuperscript{148}

Improved breeds of hogs were quite common. Since this was the chief means of converting corn into cash, suggestions

\textsuperscript{143} Country Gentleman, 34:186-187, Sept. 22, 1864.
\textsuperscript{144} Iowa state agr. soc. report, 1862, p. 129.
\textsuperscript{145} Hall, op. cit., p. 360. 1928.
\textsuperscript{146} Schmidt, "Farming in Iowa in the sixties," Wallaces' Farmer, 55:1574.
\textsuperscript{147} Iowa state agr. soc. report, 1870, p. 15.
\textsuperscript{148} U. S. census of 1870, Vol. on Manufactures, p. 517.
for betterment were readily followed. In fact, it was thought that the farmers who had not adopted the improved breeds must be few. Magee, Chester White, Suffolk, and the Poland breeds were introduced throughout the state, and they became the most popular breeds for the improvement of the general stock. The Chester Whites were perhaps slightly more common because they had good hair to withstand the rigors of the climate; they would fatten at any age; they were quiet and not inclined to roam; and they fattened well in a clover pasture.

When hogs were slaughtered, all parts of the carcass were used. The offal and refuse from the lard and grease vats, and the bones, were dried and pulverized and used in the manufacture of commercial fertilizer, most of which was shipped east. Such exportation was deemed unwise by at least one Iowan, who protested that such fertilizer should be left here for future use in restoring the fields so rapidly being depleted through exhaustive methods of farming.

Horses and Mules

Though the number of horses in the state increased during the ten-year period from 175,088 head to 433,642 head, an increase of almost 250 percent, the first
interest in horses was manifested with the demands for the army. The taking of such large numbers from the fields had by no means the disastrous effects which it was thought would follow their wholesale removal. Improved machinery, the extension of the railroads and other means of easy communication lessened the dependence of the farmers on the animals. As a matter of fact, even the interest in horses had so declined in 1867 that there were only two thoroughbred stallions exhibited at the state fair. Some people did devote their time to the raising of blooded horses, however, and the Bashaw stock of Muscatine County had a national reputation. Morgan and Black Hawk breeds were quite generally preferred. By the end of the decade more attention was also paid to mules, chiefly because they were less liable to disease, they could endure more fatigue, required less grain, and came to maturity earlier.

Animal Products - Butter and Cheese

Another interest attracted attention late in the period - that of butter and cheese making. Manufacture at different times during the decade showed a steady increase in butter manufacture, while that of cheese remained steady

156. Ibid., 1867, p. 133.
or decreased slightly. The census reports show the pounds
of butter and cheese manufactured during the decade:

<table>
<thead>
<tr>
<th>Year</th>
<th>Butter (pounds)</th>
<th>Cheese (pounds)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1860</td>
<td>11,953,666</td>
<td>918,635</td>
</tr>
<tr>
<td>1863</td>
<td>13,675,500</td>
<td>902,701</td>
</tr>
<tr>
<td>1865</td>
<td>14,538,216</td>
<td>1,000,738</td>
</tr>
<tr>
<td>1867</td>
<td>19,192,727</td>
<td>1,403,864</td>
</tr>
<tr>
<td>1869</td>
<td>22,065,724</td>
<td>1,188,546</td>
</tr>
<tr>
<td>1870</td>
<td>27,512,179</td>
<td>1,087,741 157</td>
</tr>
</tbody>
</table>

Most of the farmers who engaged in this business at all
conducted it as a side line, making enough for home use
but none for sale. As late as 1868 Iowa had but three
factories for making butter and cheese.158 The demand for
the Iowa product, as well as that of most of the western
states, did not necessitate a further spread of the industry.
Porosity and bad flavor, resultants of carelessness,
in efficiency, or ignorance in manufacture, did not stimulate
an overwhelming market call for cheese. And western butter
did not enjoy a high reputation. The chief criticisms
were that the butter maker showed lack of skill in making his
product, and that rank grasses, noxious plants, or poor
water caused an unpleasant taste.159 During the Civil War
decade the chief importance of this industry was that it
showed the necessity of selecting and breeding better
cattle.160

159. Ibid., 1869, p. 363.
160. Ibid., p. 367.
ORGANIZATIONS

Agricultural Societies

Agricultural societies were considered the most important helps to agricultural reform. "When a society is well managed, its influence is felt in every house, and in almost every school district of the county, stimulating the minds of the farmers to better methods of husbandry. The annual fair is the great educator, bringing thousands of people together, with the results of their industry, and giving them the opportunity to study each other's improvements, and to compare notes."161

The State Agricultural Society had been formed in 1853, though county organizations had been in existence since 1836. The state society published its report every year, the first one appearing in 1857. Each volume contained a report of agriculture for the state for that year. This report was particularly well handled during the decade of the sixties when J. M. Shaffer of Fairfield was the efficient secretary of the society. His influence in fostering

agricultural improvements and experiments has already been indicated. Following the report there were essays on various subjects of state interest, such as progress in certain industries, experiments in different phases of agriculture, and the adaptability of the state for various types of farming, such as fruit growing or animal production. Early in the decade there were essays on the cost of fencing, for there was no little difficulty with those farmers who failed to keep their stock from running at large. Most of the essays protested against compulsory fencing, for they maintained that it would cost more than the hiring of shepherds. At the close of the volume the compilations of the county reports, including the progress of different types of agriculture, crop averages for the year, and the general interests of the county, were summarized. In 1867 the last part of the publication was taken up with the reports of the newly formed Horticultural Society (formed June 26, 1866). The two societies continued their joint publication for three years, although the separate publications of the Horticultural Society were available with the first report of 1867.

The Horticultural Society's first interests were fruit growing and the planting of groves. Its aims were: to prove that the state was adapted to horticulture; to create an interest for horticulture; and to disseminate knowledge.

162. Iowa state agr. soc. report, 1867, Horticultural section, p. 5.
163. Ibid., 1868, pp. 7-8.
The Society expected that Iowa could grow some fruits, and despite the failures of earlier attempts at fruit raising, its members planned to encourage the industry here. They realized that certain fruits were not adaptable to every section of the state; hence they appointed committees for the northern, southern, and central divisions of the state, to determine which fruits were best suited to cultivation in each section.\textsuperscript{164} In 1867 and 1868 the Society was given an annual appropriation of $800 by the state legislature.\textsuperscript{165}

The fair was of course the outstanding exhibit of the state societies. Fair grounds, in fact, came to be as "common as Court Houses."\textsuperscript{166} This was partly because of the state encouragement to the organizations, and partly because agriculture was the predominating interest of the state. "Men attend agricultural fairs to witness improvements, to study new inventions, to purchase implements and animals, as well as to make an interchange of thought and opinion upon all subjects connected with agricultural development."\textsuperscript{167}

Twice during the decade did the interest in the fair wane. The first time was in 1861 when the tension of the state was high, with national affairs having just reached the crisis of war. Patriotism was high, and there was a question whether in the face of events it would be practicable to

\textsuperscript{164} Ibid., p. 9.  
\textsuperscript{165} Ibid., 1869, p. 13.  
\textsuperscript{166} Ibid., 1861, p. 6.  
\textsuperscript{167} U. S. dept. of agr. report, 1864, p. 177.
have the state fair. When it was decided to go ahead with the exhibits, rains and unfavorable weather so decreased the attendance and thereby the receipts that the executive committee was unable to pay the premium awards. They finally decided to pay 50 percent, and the winners were thankful for even that amount. 168 The other time during the decade when the holding of the fair was questioned was when, in 1862, Indian raids in the northwest and "Secesh" raids along the southern border absorbed the attention of more people than did the preparation of food and animals for exhibit. 169

The number of entries in the state fair was somewhat reduced in 1863 when a fee was required for each entry. In 1864 this ruling was changed and an all-inclusive fee of $1.00 was made. This allowed the entrant to exhibit as many articles in as many classes as he chose. 170

Animals and agricultural implements were accorded the greatest interest among the entries, and through their exhibits it was comparatively easy to trace the progress of their use from year to year. Other entries appealed to the women, especially those ever-increasing entries which applied to the home. All kinds of canned fruits and vegetables, preserves, jellies, and fancywork were shown, and

169. Ibid., 1862, pp. 129-130.
170. Ibid., 1863, p. 13; 1864, p. 10.
Table III
ENTRIES IN THE IOWA STATE FAIR, 1856-1870

<table>
<thead>
<tr>
<th></th>
<th>1856</th>
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<th>1859</th>
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<td>Cattle</td>
<td>145</td>
<td>169</td>
<td>146</td>
<td>125</td>
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<td>Horses</td>
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<tr>
<td>Mules</td>
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<tr>
<td>Sheep</td>
<td>22</td>
<td>10</td>
<td>33</td>
<td>37</td>
</tr>
<tr>
<td>Swine</td>
<td>27</td>
<td>19</td>
<td>26</td>
<td>38</td>
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<tr>
<td>Agricultural Implements</td>
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<td>Farm Products</td>
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<td>Other Classes</td>
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<table>
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<th>1864</th>
<th>1865</th>
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</tr>
</thead>
<tbody>
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<td>Cattle</td>
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<td>67</td>
<td>79</td>
</tr>
<tr>
<td>Horses</td>
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<td>Mules</td>
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<td>25</td>
<td>23</td>
<td>30</td>
</tr>
<tr>
<td>Sheep</td>
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<td>107</td>
<td>76</td>
<td>159</td>
</tr>
<tr>
<td>Swine</td>
<td>47</td>
<td>52</td>
<td>40</td>
<td>27</td>
</tr>
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<td>221</td>
<td>205</td>
</tr>
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<td>519</td>
</tr>
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<td>1276</td>
<td>1334</td>
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<tr>
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<td>$8522</td>
<td>$4460.05</td>
</tr>
<tr>
<td>Paid in Awards</td>
<td>3988</td>
<td>3549</td>
<td>4183</td>
<td>3630</td>
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<table>
<thead>
<tr>
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<th>1868</th>
<th>1869</th>
<th>1870</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cattle</td>
<td>94</td>
<td>105</td>
<td>129</td>
<td>167</td>
</tr>
<tr>
<td>Horses</td>
<td>188</td>
<td>140</td>
<td>278</td>
<td>247</td>
</tr>
<tr>
<td>Mules</td>
<td>12</td>
<td>11</td>
<td>34</td>
<td>34</td>
</tr>
<tr>
<td>Sheep</td>
<td>118</td>
<td>138</td>
<td>31</td>
<td>112</td>
</tr>
<tr>
<td>Swine</td>
<td>48</td>
<td>94</td>
<td>164</td>
<td>211</td>
</tr>
<tr>
<td>Agricultural Implements</td>
<td>379</td>
<td>278</td>
<td>333</td>
<td>687</td>
</tr>
<tr>
<td>Farm Products</td>
<td>251</td>
<td>222</td>
<td>415</td>
<td>358</td>
</tr>
<tr>
<td>Other Classes</td>
<td>706</td>
<td>606</td>
<td>1261</td>
<td>1901</td>
</tr>
<tr>
<td>Total Exhibits</td>
<td>1796</td>
<td>1594</td>
<td>2645</td>
<td>3697</td>
</tr>
<tr>
<td>Receipts</td>
<td>$9528</td>
<td>$7132</td>
<td>$12075</td>
<td>$11287</td>
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<tr>
<td>Paid in Awards</td>
<td>4350</td>
<td>4810</td>
<td>4775</td>
<td>7013</td>
</tr>
</tbody>
</table>

171. Ibid., for each year, and collection in the report for 1870, pp. 38, 40. There is a slight variation between the yearly averages and the cumulative report.
the number of awards made in these divisions gradually increased during the decade.

The first horticultural fair was held in conjunction with that of the state agricultural society at Clinton and Lyons in 1868. The exhibition was a pronounced success. The chief interest was in apples, and though the crop for the year was below average, the fair exhibits were equal to any shown at any time in the state. John Grinnell of Clayton, Clayton County, had thirty varieties, and D. W. Adams of Waukon had about thirty-five varieties. The latter were of especial interest because they were grown on the open prairies forty miles farther north than any fruit which had ever been exhibited in the state. Horticulturists took this to mean that no part of the state was too far north for a good apple crop, and they encouraged even more persistently the planting of additional numbers of trees.172

The Iowa Agricultural College

Iowa Agricultural College was created by an act of the state legislature on March 22, 1858, when provision was made for the establishment of a state agricultural college and farm. The same year $10,000 was appropriated for a farm, and 648 acres were bought in Story County in 1859.173 In 1862 the United States Congress passed the Morrill Act,

giving each state 30,000 acres of land for each representative and senator in Congress for the establishment of a state agricultural college, with the specific objective of encouraging agriculture and the mechanic arts. Through this grant, which Iowa was one of the first ten states to accept, 240,000 acres were added to that which the state had purchased in 1859. 174

The college opened October 19, 1868 and continued in session until January 7, 1869. Its faculty consisted of a president, three professors, and seventy-five students. 175 The college was formally dedicated and Adonijah S. Welch, senator from Florida, was inaugurated as the first president on March 17, 1869. At that time there were nine faculty members, including President Welch, the matron, and the superintendent of the farm. There were ninety-three freshmen the first term, including seventy-seven boys and sixteen girls; and there were eighty students in the preparatory school, including fifty-nine boys and twenty-one girls, making the entire enrollment for the first semester 175 in both the regular college and the preparatory division. Attendance dropped to 168 for the second semester. All students were required to spend a part of each day in manual labor for which they were paid wages ranging from three to ten cents an hour, dependent of course on the type

175. Shambaugh, Benjamin, op. cit., III:277-278.
of work they were doing. The amount paid for student labor in 1869 was $4,597.65. 176

The subjects taught the first term were those which were primarily agricultural in scope and application; and with the actual practice which accompanied the class room work there was little chance to criticize the tendency toward scientific farming against which there had been such a prejudice. Courses offered, which were the same for both boys and girls during the first two years, were mathematics, practical agriculture, chemistry, geology, and French or German. Piano was also taught. By the end of the first year the faculty had been increased to seventeen members.

Newspapers and Periodicals

The agricultural college, with its emphasis on practical studies, helped to breakdown the prejudice against book farming. So too did the increased circulation of the agricultural newspapers and periodicals. The American Agriculturist, though published in the east, maintained an extensive circulation throughout the middlewest, and its editor, Orange Judd, prided himself for the contributions which he received from his western readers. Other magazines with rational circulations which were read through the west were the Country Gentleman, The Valley Farmer, published in 176. U. S. dept. of agr. report, 1869, p. 453.
St. Louis, The Prairie Farmer published in Chicago, and The New England Farmer. The New York Daily Tribune enjoyed a similar extensive circulation in the middle west, and devoted several columns in its issues to the agricultural news of that section of the country.

There were, in 1860, 130 newspapers published in Iowa, and their circulation reached 39,240 copies, and one farm periodical, The Iowa Homestead. By 1870 there were 233 newspapers with a circulation of 219,090 copies, and four new farm magazines: The Western Stock Journal and Farmer published in Iowa City; The Pioneer Farmer published in Sioux City; The Western Pomologist published in Des Moines; and The Western Stock Journal published in Sigourney. The agricultural press was declared to be the most important agricultural educator.

CONDITIONS AT THE CLOSE OF THE DECADE

Population

By the close of the Civil War decade Iowa had changed materially in all respects. Her population had increased to 1,194,020, an increase of 76.9 percent during the decade, and the state had risen in population from twentieth place to eleventh. The ten largest counties were again those of 1860: Clinton, Clayton, Des Moines, Dubuque, Johnson, Lee, Linn, Marion, Polk, and Scott. The density of population of the states had increased from 12.2 percent to 21.5 percent, with Scott County showing the greatest gain and a density of 84.8 percent.

The extension of the agricultural frontier was clearly reflected in the increase of farm acreages. The number of farms increased during the decade from 59,629 to 116,292, while the acres of improved land had increased from 3,792,792 acres to 9,396,467 acres, and unimproved land decreased from 6,277,115 to 6,145,326 acres. By 1870 all of the ninety-nine counties had been organized. The

179. Hull, op. cit., pp. 8, 125.
180. Ibid., pp. 197-199.
181. Ibid., p. 244.
182. Ibid., p. 132.
frontier line cut across the counties of Winnebago, Hancock, Kossuth, Wright, Calhoun, Carroll, and Shelby, leaving all of the counties to the northeast except Osceola, Sioux, Harrison, and Pottawattamie within the frontier region.

The increase in Iowa's population still continued to come in a large part from immigration. This was accelerated particularly through the Homestead Law of 1862, which reduced to a minimum the cost of western land. It was also given a new impetus through the lack of houses in the cities and towns, and through the demand for improved farms.183

"Trains rarely traverse the State westward, without some families seeking a home with us," was the observation of the secretary of the State Agricultural Society.184 The railroads themselves served to encourage migration to the west. The Burlington and Missouri railroad furnished a building near the depot in Burlington for the foreigner and for the stranger until they could provide some sort of shelter for themselves. Information was accessible in all the principal languages and countries of Europe. Railroad lands were sold in lots of forty acres or more on ten years credit with interest at six percent; but if full payment was made at the time of purchase, a twenty percent reduction was available. Prices of these railroad lands varied from $4.00 to $15.00 per acre, depending upon their distance from the line of the

184. Ibid., 1870, pp. 10-11.
road. From April 1 to the end of the year (1870) 105,000 acres were disposed of to 1,077 people.

The commissioners of emigration also attempted to send immigrants west, providing they received money from responsible people to help pay the cost of transportation. Sometimes, though, those who paid the cost of transportation never saw the people whose labor they had purchased. Often the immigrants would be started to a certain locality in the west, but lack of knowledge, conversation with other people, acceptance of the offer of someone else, or mistake kept them from reaching their intended destinations. The suggestion that the west maintain agents in the east to accompany immigrants westward was not adopted. One-fifth of the 1870 population of the state was foreign, having come principally from Germany and the British Isles, as had been the case during the previous decade. This was no doubt fortunate. "The Yankee farmer has been characterized as a depleter of soils and a destroyer of forests, and certain it is that his restless spirit and eager enterprise fitted him rather to be an exploiter than a conserver of natural resources. The European immigrant who followed in his footsteps knew the value of land, was accustomed to careful farming, and was by nature painstaking and industrious." Together with this steady increase of immigration to

186. Mark, Frederick, Economic history of Wisconsin during the Civil War decade, pp. 45-47.
swell the population there was, after the war, the necessity of reabsorbing the returning soldiers into the daily life of the state. Iowa had furnished more than 76,000 troops out of the 79,500 called,\textsuperscript{187} a larger number in proportion to her population than were furnished by any other state.\textsuperscript{188}

But people feared that with this constant influx of settlers Iowa would be swamped with labor and her whole system of industry would be seriously disarranged. Such was not the case, however. Resources demanding development were so great that labor supply was not adequate to fill the needs and agitation for higher wages and shorter hours was frequent.\textsuperscript{189}

**Industries**

One of these industries to which too little attention and encouragement had been paid, and for which resources of the state were readily available, was manufacturing. Iowa contained all of the elements essential for their growth, and the only reasons advanced for failure to provide them were the lack of capital and the ease with which they could be sent to other parts of the country for finishing.

Governor Merrill in his first biennial message on January 11, 1870 indicated the necessity of developing home manufactories, and he recommended a law exempting from taxation for an


\textsuperscript{188} Iowa 11th General Assembly. Legislative Documents, 1866. pp. 3-4.

\textsuperscript{189} U. S. dept. of agr. report, 1865, p. 2.
indefinite term of years at least a portion of the investment in certain classes of manufactures in the state. His recommendation was stated so broadly that no action was taken by the legislature upon it. By 1870 the value of all manufactures had increased from $13,971,325 to $46,554,322, with an increase in capital invested from $7,247,180 to $22,420,183. Iowa's 6,566 manufacturing establishments included those for carpentry and building, flouring and grist mill products, sawmills, saddlery and harness plants, factories for making tin, copper, and sheet iron wear, carriages and wagons, and furniture.

Agriculture and Agricultural Organizations

Agriculture had changed considerably in ten years. The farmer had changed his system of cultivation from one which was extensive and exploitive to one which was diversified. He had introduced varied products, at first as substitutes for those made inaccessible through the suspension of trade with the south. Some of the products, as sorghum and tobacco, did not go out of cultivation with the return of peace. In fact, the number of gallons of sorghum syrup made in 1880 was only slightly less than the amount made in 1870. Census of 1870, Vol. on Wealth and Industry, pp. 392-393. Ibid., p. 516.

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190. Iowa 13th General Assembly, 1870, Legislative documents, p. 40.
192. Ibid., p. 516.
1870: 2,037,398 gallons to 2,979,480. In the case of tobacco, Iowa's crop in 1880 was 420,477 pounds, an increase from 1870 of almost 600 percent.

There was no branch of agriculture in which a decided progress had not been made. Only three products raised in the state showed a decrease in yield: buckwheat, maple sugar molasses, and sweet potatoes. Averages for 1860 and 1870 are shown in Table IV.

The decade of the sixties witnessed important developments in agricultural organization. Iowa Agricultural College was opened, and applications for admission increased rapidly. By the spring of 1870 there were more than 500 applications to President Welch for admittance, with twenty-eight of them coming from other states. The college could accommodate 160, and the farmers nearby could take care of but fifty more. That spring there were 200 students in school, and 300 had been refused. The attendance was larger than that of any other agricultural college in the country, according to the report of the secretary of the State Agricultural Society.

He continued, "Agriculture has hitherto been pursued among us as a mere art, or as a kind of chance enterprise; but it is beginning to be prosecuted as a science, and I am safe in saying that in the no distant

194. Ibid., p. 82.
**Table IV**

**COMPARATIVE DEVELOPMENT OF IOWA IN 1860 AND 1870**

<table>
<thead>
<tr>
<th></th>
<th>1860</th>
<th>1870</th>
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</thead>
<tbody>
<tr>
<td><strong>Acreage</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Improved land</td>
<td>3,792,792</td>
<td>9,396,467</td>
</tr>
<tr>
<td>Unimproved land</td>
<td>6,277,115</td>
<td>6,145,326</td>
</tr>
<tr>
<td><strong>Cash Values</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Farms</td>
<td>$119,899,547</td>
<td>$392,622,441</td>
</tr>
<tr>
<td>Implements</td>
<td>5,327,033</td>
<td>12,895,139</td>
</tr>
<tr>
<td>Livestock</td>
<td>22,476,293</td>
<td>82,987,133</td>
</tr>
<tr>
<td><strong>Crops (bushels)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Corn</td>
<td>42,410,686</td>
<td>68,935,065</td>
</tr>
<tr>
<td>Wheat</td>
<td>8,449,403</td>
<td>29,435,692</td>
</tr>
<tr>
<td>Oats</td>
<td>5,887,645</td>
<td>21,005,142</td>
</tr>
<tr>
<td>Barley</td>
<td>467,103</td>
<td>1,960,779</td>
</tr>
<tr>
<td>Buckwheat</td>
<td>215,705</td>
<td>144,920</td>
</tr>
<tr>
<td>Rye</td>
<td>183,022</td>
<td>505,807</td>
</tr>
<tr>
<td>Hay (tons)</td>
<td>813,173</td>
<td>1,777,339</td>
</tr>
<tr>
<td><strong>Flax</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bushels flaxseed</td>
<td>5,921</td>
<td>88,621</td>
</tr>
<tr>
<td>Pounds fiber</td>
<td>30,226</td>
<td>695,518</td>
</tr>
<tr>
<td><strong>Molasses, gallons</strong></td>
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<td></td>
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<tr>
<td>Maple</td>
<td>11,405</td>
<td>9,315</td>
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<tr>
<td>Sorghum</td>
<td>1,211,512</td>
<td>1,218,636</td>
</tr>
<tr>
<td>Peas and beans</td>
<td>41,061</td>
<td>42,313</td>
</tr>
<tr>
<td>Irish potatoes</td>
<td>2,806,720</td>
<td>5,914,620</td>
</tr>
<tr>
<td>Sweet potatoes</td>
<td>61,362</td>
<td>34,292</td>
</tr>
<tr>
<td><strong>Livestock</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Horses</td>
<td>175,088</td>
<td>453,642</td>
</tr>
<tr>
<td>Cattle</td>
<td>540,088</td>
<td>1,006,235</td>
</tr>
<tr>
<td>Pounds of butter</td>
<td>11,953,666</td>
<td>27,512,179</td>
</tr>
<tr>
<td>Pounds of cheese</td>
<td>918,635</td>
<td>1,087,741</td>
</tr>
<tr>
<td>Swine</td>
<td>934,820</td>
<td>2,409,679</td>
</tr>
<tr>
<td>Sheep</td>
<td>259,041</td>
<td>855,493</td>
</tr>
<tr>
<td>Pounds of wool</td>
<td>660,858</td>
<td>2,967,043</td>
</tr>
<tr>
<td><strong>Acres of timber planted</strong></td>
<td>8,360</td>
<td>19,675</td>
</tr>
<tr>
<td><strong>Rods of hedge</strong></td>
<td>306,728</td>
<td>3,593,061</td>
</tr>
<tr>
<td><strong>Fruit trees</strong></td>
<td>2,337,594</td>
<td>5,640,150</td>
</tr>
<tr>
<td><strong>Pounds of grapes gathered</strong></td>
<td>294,755</td>
<td>2,128,472</td>
</tr>
<tr>
<td><strong>Value of market-garden products</strong></td>
<td>$169,970</td>
<td>$244,963</td>
</tr>
<tr>
<td><strong>Value of orchard products</strong></td>
<td>118,377</td>
<td>1,075,189</td>
</tr>
</tbody>
</table>

*Iowa rose in rank from 16th to 5th place in acres of improved land. Hull, op. cit., p. 132.

future it will rank first among the sciences." 197

There were good reasons for the adoption of these scientific methods of agriculture. The end of the free land era had come, and intensive farming was demanded. Farming had changed from the pioneer to the commercial stage bringing with it the transition from hand to machine methods of cultivation. Agencies had been established for the promotion of agricultural knowledge. 198 No longer was the idea of the old negro, who considered book farming none too favorably, prevalent: "We are all ruined now, and Master will have to go to jail, for he has come home from Albany with a new farming book!" 199

The decade also saw the establishment of the United States department of agriculture. Before this time there had been no need for such a department, for at the time of the Revolutionary War the population was sparse and the soil was extensive and fertile; and after peace had been restored, only those departments of government were created which were, or soon became, imperative. A new agricultural spirit developed with the western migrations, however, and societies gradually sprang up after the beginning of the new century. The societies turned their attention to the national government for aid and encouragement, and the creation of the agricultural division of the Patent Office

was the result. At first this division was simply a clerkship for gathering statistics and having them printed along with general statements about agriculture in general. In 1842 the report of the Patent Office with the division of agriculture was published with the report on mechanics. It first appeared as a separate volume in 1842. The department of agriculture was created May 15, 1862, and began work in July of the same year. Isaac Newton was its first commissioner, and its first report was published in January, 1863.

Railroad Transportation

Railroad construction in Iowa was only slightly interrupted during the Civil War. At no time during the four years did construction cease absolutely as it did in some others of the states. However, the lack of an adequate labor supply, caused both by enlistments in the army and removal to the east because of the payment there of higher wages, did discourage the rapidity of construction temporarily.

After the war, building went forward at a rapid rate, and Iowa in 1870 presented a far different aspect to the immigrant than it had ten years earlier. In 1860 there had been less than 700 miles of railroad; by 1870 there were 200. J. S. patent office report, 1860, p. 12.
four lines extending across the state. The Chicago and Northwestern was the first line completed across Iowa. It reached Council Bluffs in 1867. Others which completed lines across the state by 1870 were the Chicago and Rock Island (later the Chicago, Rock Island and Pacific), completed to Council Bluffs in 1869; the Chicago, Burlington and Quincy built to Council Bluffs the same year; and the Illinois Central which reached Sioux City in 1870.  

Iowa ranked sixth in railroad mileage (with 2,683 miles) being surpassed by Illinois, Pennsylvania, New York, Ohio, and Indiana.  

For Iowa this extension of railroad facilities had come as a necessity to furnish an outlet for the expanding grain trade. Grain production west of the Mississippi was doubled after the war, with most of the increase in Iowa, Minnesota, and California. Added facilities for transportation were imperative, and the railroad furnished the agency through which a better means of marketing was provided. 

The railroads were also important to the state in encouraging western settlement and gradually filling out this section of the country. The construction of the Union Pacific railroad, and its completion in 1869 as the first transcontinental line, diminished the horrors of the unsettled frontier region and greatly accelerated immigration.  

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During the decade, as during that of the fifties, the railroads kept immigrant agents in Europe as well as in the United States to keep the foreign population moving west; and they used the same methods of reduced rates, supplying men to accompany them on the journey, or furnishing living accommodations until they were settled. 203

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VI

SUMMARY

The study of agricultural experiments in Iowa during the Civil War decade is interesting for a number of reasons. There was the unprecedented growth in the number of farms, almost doubled during the decade. Wheat production had more than trebled, and corn almost doubled in production. The transition from hand to machine methods of farming marked a distinct change to a more intensive type of cultivation. Attempts were made to make Iowa a sorghum sugar producing state. The sheep industry began and declined rapidly in the ten years. The spread of railroads throughout the state made the shipment of Iowa products to the east easier and more satisfactory. And towards the end of the decade there was a definite tendency to diversify agriculture, giving thereby a more permanent character to the improvements made.204

This attainment of prosperity was disastrous. Such a degree of success had been hitherto unknown; and its coming at this time accelerated over-expansion and inflation. The inevitable depression which followed brought on

greenbackism and the granger movement, with accompanying discontent and complete lack of understanding or sympathy. In all, "the decade of the sixties was a period of great, and to some degree premature and unsound, expansion of northwestern agriculture. Abnormal war demands and abnormally expanded foreign markets with the productive possibilities of new land and new machinery and the elusive stimulus of an inflated currency created boom times which, after the war, were inevitably succeeded by depression."205

LITERATURE CITED

American Agriculturist
Vol. 23, p. 35, 70, 170, 175, 202. 1864.
Vol. 25, p. 129, 134, 316. 1866.
Vol. 28, p. 17. 1869.
Published by Orange Judd. New York City.

N. Y. Ayer and Son, Philadelphia, 1880.


State Hist. Soc. of Iowa. Iowa City.

Code of Iowa
1851, p. 378.
1872, p. 299.

The Country Gentleman
Vol. 19, p. 20. 1862.
Vol. 21, p. 13. 1863.
Published by Luther Tucker and Son. Albany.

Hull, John A. T., A historical and comparative census of Iowa, 1836-1880, intro., p. xxiv, xxv, p. 8, 64-132, 180-199, 244-274, 296-362.
Des Moines, Iowa. 1883.

Iowa Board of Immigration. Iowa: the home for immigrants, p. 21, 23, 24, 57, 67.
Published by the order of the Iowa Board of Immigration. Des Moines, Iowa. 1870.
-97-

The Iowa Legislative Documents
7th Gen. Assem. 1866. First biennial message of the
governor, p. 3-4.
9th Gen. Assem. 1870. p. 40; Census returns, p. 99,
Report of the auditor, p. 5-6.

The Iowa State Agricultural Society, Reports
1859, p. 7.
1860, p. 110, 120.
1861, p. 3-10, 126.
1862, p. 129, 130.
1863, p. 5-13, 462.
1864, p. 5-15, 172.
1865, p. 7-15.
1866, p. 11-17.
1867, p. 7-25, 126, 133.
1869, p. 5-15. Horticultural section, p. 5.

Merk, Frederick, Economic history of Wisconsin during the
Civil War decade, p. 46-47.

Pollock, Ivan L., History of economic legislation in Iowa,
p. 9-17, 26-46, 78, 172-177.
State Hist. Soc. of Iowa. Iowa City. 1918.

Pollock, Ivan L., "State finances in Iowa during the Civil
War," Iowa Jour. of Hist. and Pol. 16:82,85,104. 1918.
State Hist. Soc. of Iowa. Iowa City.

Preston, Howard H., History of banking in Iowa, p. 49-58.
State Hist. Soc. of Iowa. Iowa City. 1911.

Riegel, Robert E., The story of the western railroads,
p. 6, 96-106, 230-251.

Roll, Charles, "Political trends in Iowa history," Iowa
State Hist. Soc. of Iowa. Iowa City.
State Hist. Soc. of Iowa. Iowa City.


State Hist. Soc. of Iowa. Iowa City.

Shambaugh, Benjamin F., The messages and proclamations of governors of Iowa, Ill: 94,264,267,277-278.
State Hist. Soc. of Iowa. Iowa City. 1905.

Preliminary report of the 8th census, 1860, p. 5, 209.
Vol. on manufactures, p. 161-162.

U. S. Census Office. Census of 1870.
Compendium of the ninth census. Compiled by F. A. Walker.
p. 510, 702-704. 1873.
Vol. on manufactures, p. 489, 517.
Vol. on wealth and industry, p. 392-393, 516.

U. S. Department of Agriculture, Reports
1862, p. 5, 132-134, 224-280, 301, 420.
1863, p. 91, 199-201, 215.
1864, p. 87, 169-197.
1866, p. 79.
1867, intro., p. ix, 96.
1868, p. 43, 436, 609.
1869, p. 6, 37, 363-367, 409-453, 541-542.

U. S. General Land Office (Report of the commissioner)
1860, p. 27.
1861, p. 3.

U. S. Patent Office, Reports
1860, p. 12.

State Hist. Soc. of Iowa. Iowa City.
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