EARLY YEARS

SASKATOON PUBLIC
BOARD OF EDUCATION

Student Information Sheet

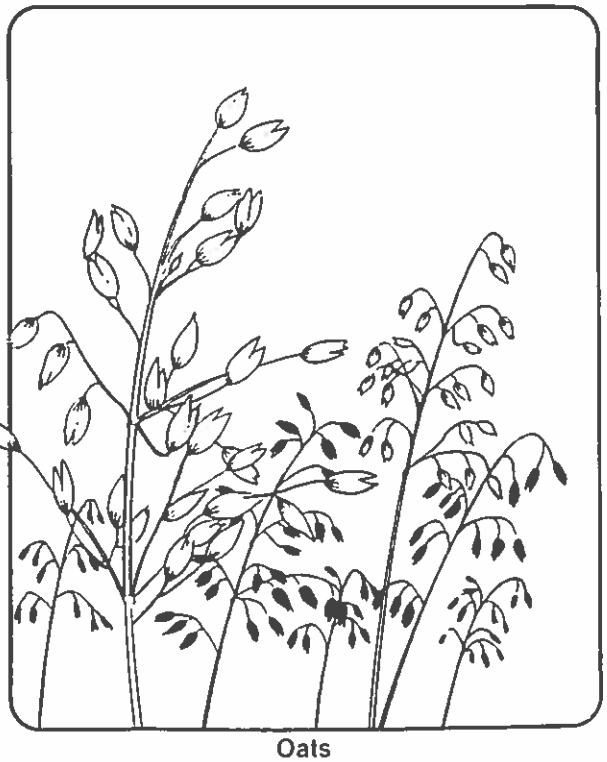
Saskatchewan Field Crops

Wheat

Wheat is Saskatchewan's most important field crop. It is used to make flour, bread, pasta and many other food products. In 1981 Saskatchewan produced 14,097 thousand tonnes of wheat.

Barley

Barley is used as an animal feed. It is also used in the manufacture of beer and in soups and other foods. 3,375 thousand tonnes of barley were produced in 1981.



Oats

The main use of oats is as a food for pigs and cattle. Oats are also used to make oatmeal and other cereals for people to eat. In 1981, 848 thousand tonnes of oats were grown in our province.

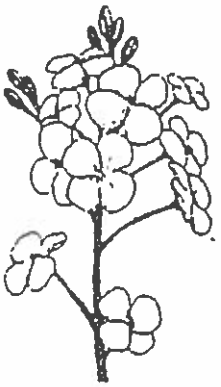
Saskatchewan Bureau of Statistics, *Economic Review 1982*
Saskatchewan Tourism and Renewable Resources Rural Living

Flax

Flax is an oilseed. Approximately 364,000 hectares (900,000 acres) were devoted to this crop in 1990. Oil from flax is used for **industrial purposes**, such as the manufacture of paint. Flax can be recognized by the purplish-blue flowers in the summer.

Rye

Rye is used in **specialty foods** like rye bread, and in the manufacture of Canadian liquor. It is also used as cattle feed. It is seeded in the fall for harvest early the next summer. Some 291,000 hectares (720,000 acres) of rye were seeded for harvest in 1990.



Canola

Canola, a type of rapeseed, has become a major source of income for prairie farmers.

The oil extracted from the seed is used in **margarine, salad oils and cooking oil**. The pulp that is left after the oil is squeezed out of the seed is a high protein **animal feed**. Saskatchewan farmers planted around 1.1 million hectares (2.75 million acres) of canola in 1990.

Canola can be recognized by the bright yellow blossoms in early spring.

Think about the products we'd be missing in our daily lives without these grains.

I. THEME A - HARVESTING WAS A NECESSITY

A. What grains were harvested?

B. What use was made of the grains?

C. What use was made of the straw?

D. What was the significance of Thanksgiving?

E. Do you think the farmers had a lot of money?

F. What did the farmer do with the grain not used on the farm?

G. Do you think a farmer has to harvest?
What would happen if he didn't?

H. Where did most of the food a pioneer used come from?

I. What sort of trouble did it present if the weather was bad?

1. BACKGROUND INFORMATION (THEME A)

a. Excitement of the Harvest

Harvesting is probably the highlight of any farm year. It is the time of year when all the hard work pays off. The rich golden grain, secure in the bins, brings about a feeling of relief and contentment in men and women of our prairies. Relief, in that the elements have been kind rather than destructive, and contentment in that all the time and energy have been rewarded. This feeling is common to all people attached to any farming community.

b. Purpose of Crop Production

The whole purpose of crop production is to provide food for human and animal consumption. The four cereal crops grown on the prairies are wheat, oats, barley and rye. These crops are easily distinguishable both in appearance and in uses made of the grains.

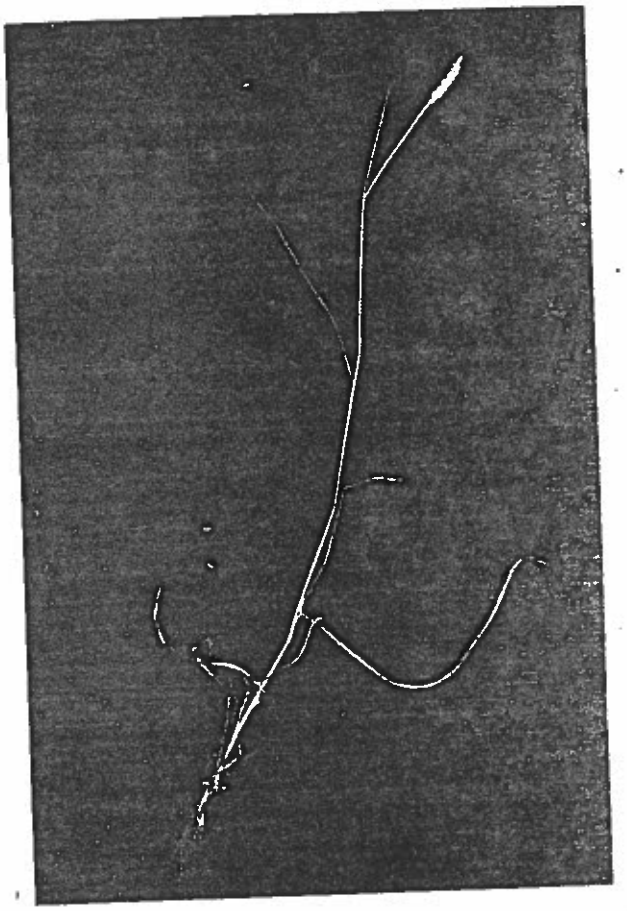
c. Types and Uses of Crops

The hard red wheat of the prairies is world famous for the quality of flour which is produced. Even in early years the main use made of wheat was flour for bread baking.

Wheat, Oats, Barley

Rye provides a different type of flour for rye bread. Oats and barley are used for a variety of cereals, however, their major importance would more likely be for livestock feed.

The whole plant of the cereal crops was used in some way. The part that was left in the field was tilled into the soil to add fibre and nutrients.



spike

hollow jointed stem

node

parallel veined leaves

fibrous roots

The grain was used for such foods as flour, cereals, noodles, bran or rolled oats. Wheat straw was usually used as bedding in the barns so that animals would have a warm, dry area in which to lie down. Oats and barley straw contained more nutrients and so was used as fodder to supplement the hay supply.

In early years the major focus was to produce grain so that the pioneer family might survive. Slowly grain production was increased and the pioneer farmer used grain to trade for other produce. Elevators were established as collection points and surplus grains were sold for production of food locally or for export.

Farm income was rather seasonal. Even though the pioneer increased his crop production, his income from grains would occur at the time of delivery. To supplement the income from grain, most early farming operations were of the mixed farming type. That is,

production, cattle and poultry were also raised. The garden plot which produced vegetables was also very important to the pioneers. Just as the size of pioneers' grain plots increased, so too did the garden area. Potatoes and corn were early staples but soon many other vegetables were added to these to enhance the offerings at the table. Fruits such as wild strawberries, raspberries, choke-cherries, and Saskatoon berries were gathered to round out the store of good foods to eat. Any surpluses were marketed, thus providing an income throughout the year. This income was used to improve their situation and to acquire necessities such as salt, spices, and other materials which they could not produce.

d. Weather Considerations

The one element the pioneer frequently worried about was the weather. Late spring or early fall frosts severely affected the crops both in terms of yield and quality. Hail storms caused serious damage. Drought or dry conditions hindered production of foodstuff. Weather frequently compounded the threat of other problems. Dry conditions increased the hazards of prairie fire and of insects such as grasshoppers flourishing. The uncertainty of the weather was one factor which necessitated the development of faith and hope in pioneering communities. When the year's crop was hailed or frozen, instead of giving up, farmers would start planning for the coming year.

2. SUGGESTED ACTIVITIES

a. Make a list of the things in the general store that a farmer would need to buy that he wouldn't buy today.

b. Find out from a pioneer how close they lived to a general store. How did they travel there? Did this influence buying habits?

c. Obtain an old Eaton's catalogue and make up a price list.

d. Make a mural or bulletin board display of each variety of grain to illustrate its characteristics and uses.

e. Make a mural of all the things produced on the farm.

f. Obtain samples of cereal crops (wheat, oats, barley, and rye) and discuss the uses of each crop. Students might examine labels of foods to see which grains are used for various products.

g. Obtain samples of mature plants of each of the four cereal crops and examine the structure of these plants.

II. THEME B - HARVESTING WAS HARD WORK INVOLVING THE CO-OPERATIVE EFFORT OF MANY PEOPLE; THIS INVOLVEMENT CHANGED WITH THE EVOLUTION OF EQUIPMENT

A. How many hours a day did the people work?

B. Describe the types of jobs that were done by the women, men, and children. Were these jobs hard? Why or why not?

C. How long did they stop for meals?

D. How many meals did they have a day? Why?

E. Count the number of different activities and estimate how many people would be involved in threshing.

F. Ask a pioneer how many people were needed for threshing.

G. Count the number of people involved in each operation: cutting, stooking, threshing.

H. How many were involved in the preparation of food?

I. Why did neighbors get together to do the work rather than do their own?

J. What were some examples of co-operation? Is there as much co-operation today?

1. BACKGROUND INFORMATION (THEME B)

THE EARLY HARVESTING PROCESS

The harvesting process would begin in late summer or early fall. The total process can be subdivided into the following four operations:

i) cutting the stalks of grain,

ii) binding the stalks of grain,

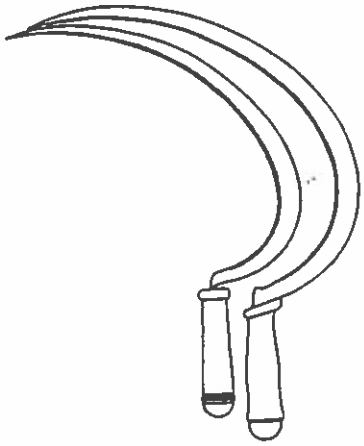
iii) stooking the bound stalks to allow them to cure or dry, and

iv) separating the kernels of grain from the straw and chaff.

If the conditions were ideal the whole process could be completed in three or four weeks, however, it frequently carried on much longer due to seasonal changes in the weather.

a. The Cutting Process

The cutting process was first done using a sickle. This one-handed tool, with a sharp curved blade, meant that a harvester had to work in a stooped position as he clutched the stalks with one hand, and worked the sickle in the other hand. It was slow, backbreaking work. With perseverance about half an acre could be cut in one day.



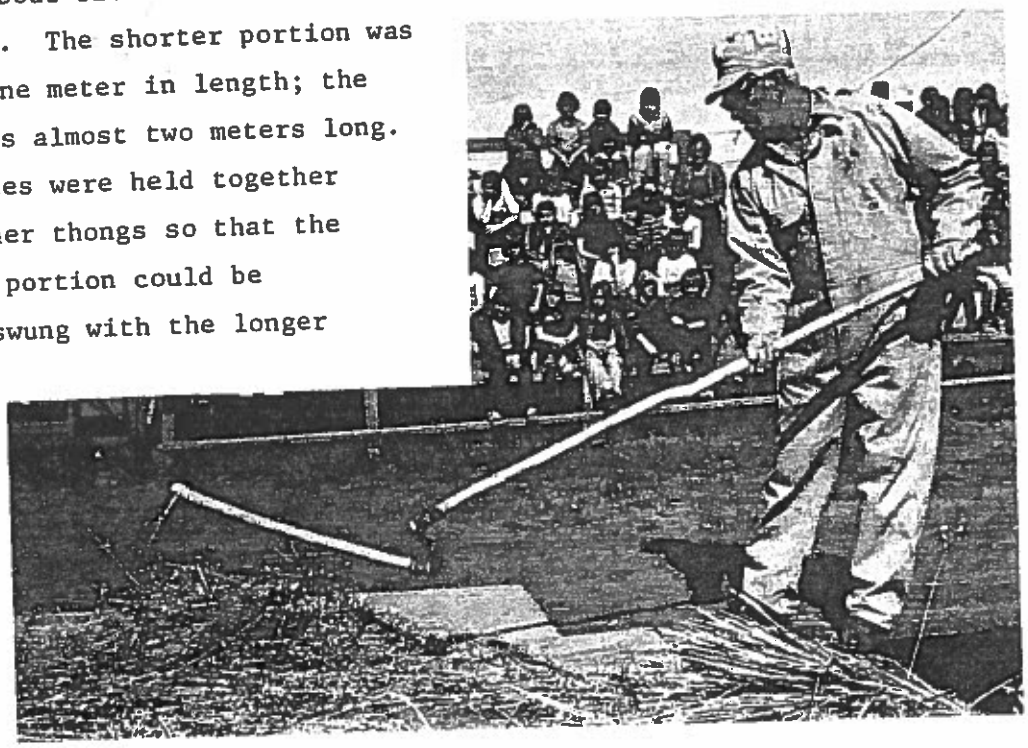
b. Binding and Stooking the Grain

The newly cut stalks had to be bound into sheaves. Stalks of grain were twisted together to form a rope-like strand and tied around a bunch of stalks to form a sheaf. These sheaves were then set up in a tent fashion so that the heads of grain would be dried in the sun and wind.

c. Separating the Grain Kernels

The threshing of the grain by the early pioneers also involved the use of simple tools. Sometimes the sheaves were brought to the farm yard, then stacked or stored in the barn until the separating could be done. Some of the early barns were built with doors on both sides so that the separating could be done in this passageway.

One of the earliest tools used in this separation process was the flail The flail consisted of two round sticks about five centimetres in diameter. The shorter portion was almost one meter in length; the other was almost two meters long. Two pieces were held together by leather thongs so that the shorter portion could be freely swung with the longer handle.

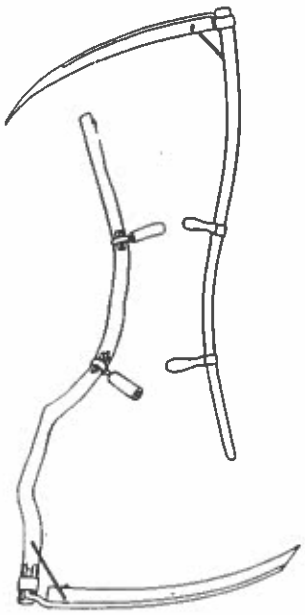


Hitting the stalks of grain with the flail freed the kernels from the stalks. The winnowing process followed to separate the kernels from the shaff. A hard day's work could yield approximately eight bushels of relatively clean grain.

CHANGE IN MACHINERY

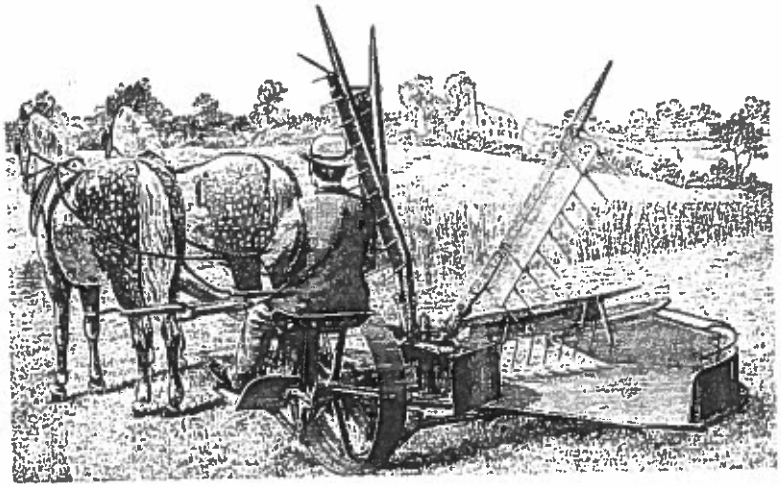
a. Cutting

Harvesting methods changed dramatically as man advanced from simple tools to simple and complex machines. The sickle was replaced by a two-handed tool called the scythe. This piece of equipment allowed the harvester to work in an upright position and a strong man could cut two and a half to three acres of grain in one day. The stalks of grain still had to be gathered together and tied into sheaves.



To the scythe the inventive pioneers added a cradle. These three or four long curved fingers caught the stalks of grain and as a result the harvester could deposit the cuttings of each sweep in a bunch. This made the tying process much easier.

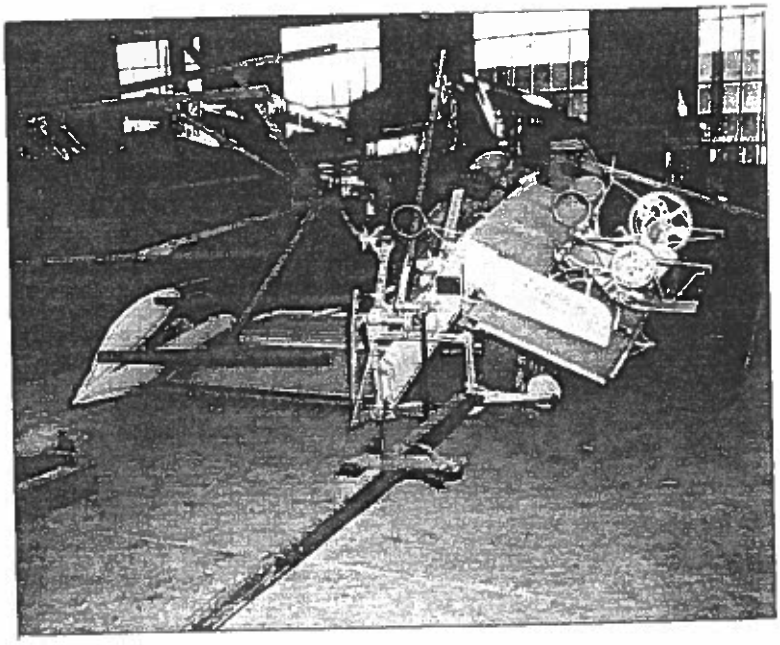
In 1831, Cyrus Hall McCormick, a young American farmer of Scottish-Irish ancestry, invented the reaper, a horse-drawn machine which cut the grain but did not bind it.



During the first half-day's trial the reaper cut as much grain as four men could cut in the same time with cradles.

b. Binding

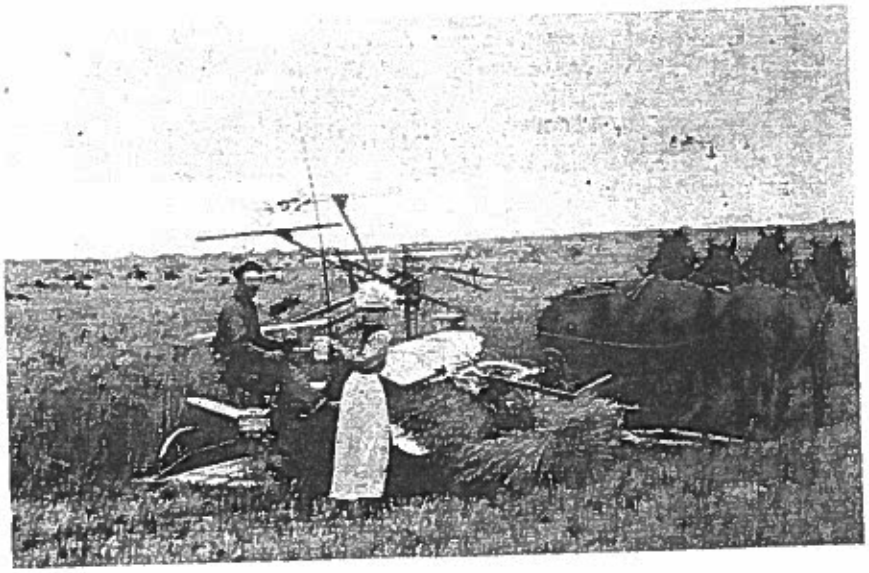
In 1874 a machine was developed that bound the grain with wire, and in 1881 the first binder twine appeared. The grain binder was a remarkable machine.



It not only cut the grain but also packed it into compact sheaves with the heads of grain all at one end, and bound each sheaf with a length of stout wire securely knotted. The sheaves were then gathered up by hand and placed upright in stooks of about eight sheaves each.

Later a sheaf carrier was added to the binder so that a group of four sheaves were dropped in rows along the field.

The binder was usually drawn by three or four horses. Since it was very steady work for the horses, the field work generally started at about seven A.M.,



COFFEE BREAK

had an hour's rest at noon and carried on till about six or seven P.M. Stooking was another matter. Women and teenage children would spend the day setting stook after stook in rows across the field. It was hot, itchy, back-breaking work. Occasionally on cool, clear, moonlit evenings the farmer and his wife would go out to stook for several hours.

c. Threshing

One of the first types of threshing machines was developed in the 1700's. It was similar to the ground-hog which is at the Western Development Museum.

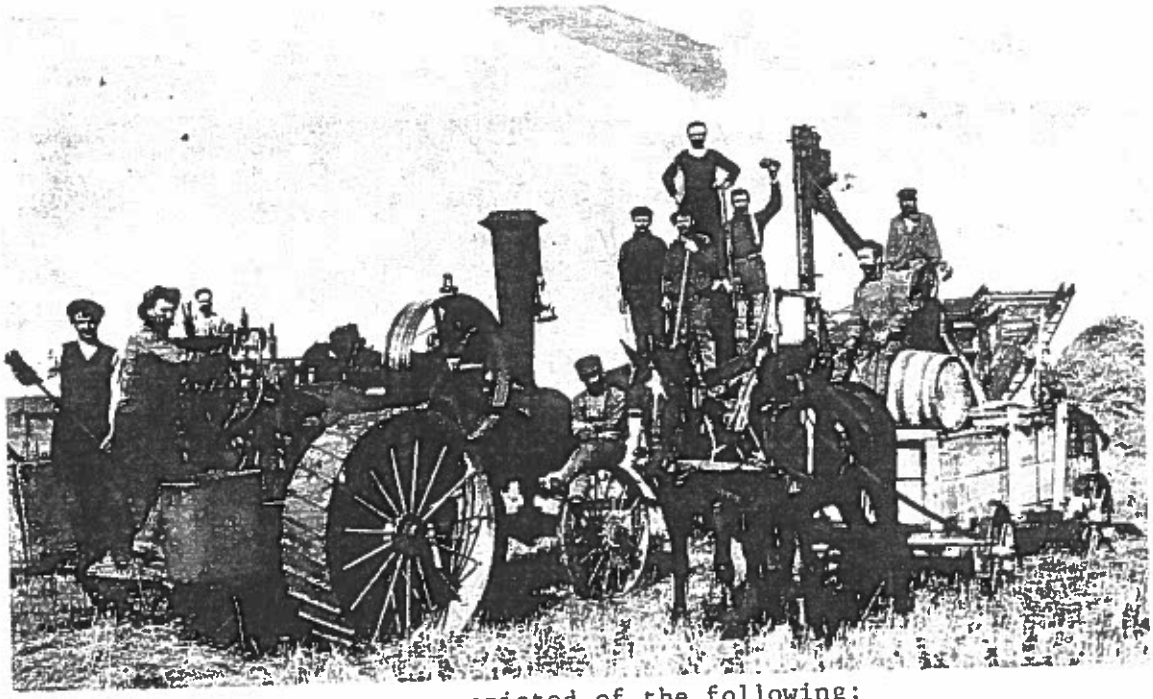
THE GROUNDHOG IN ACTION

A large cylinder with many rows of spike-like teeth rotated through a stationery concave shaped panel which also contained rows of teeth. As the stalks of

grain were fed through this machine, the kernels were again knocked free from the stalks. The number of men required to operate this machine also increased. Whereas flailing could be done by one man, the groundhog required at least four men. Two men were required to turn the cranks, one man fed the stalks into the machine, while the other cleared the straw away and carried on the winnowing process. The requirement for additional manpower almost certainly dictated that neighbors had to work together.

d. Separator

Just as there were changes to the machines which did the cutting and binding, so too were there changes to the machines which did the separating. The principle of the groundhog was expanded to include sieves, fans, grain spouts, and straw blowers. The crew grew from four to almost thirty.



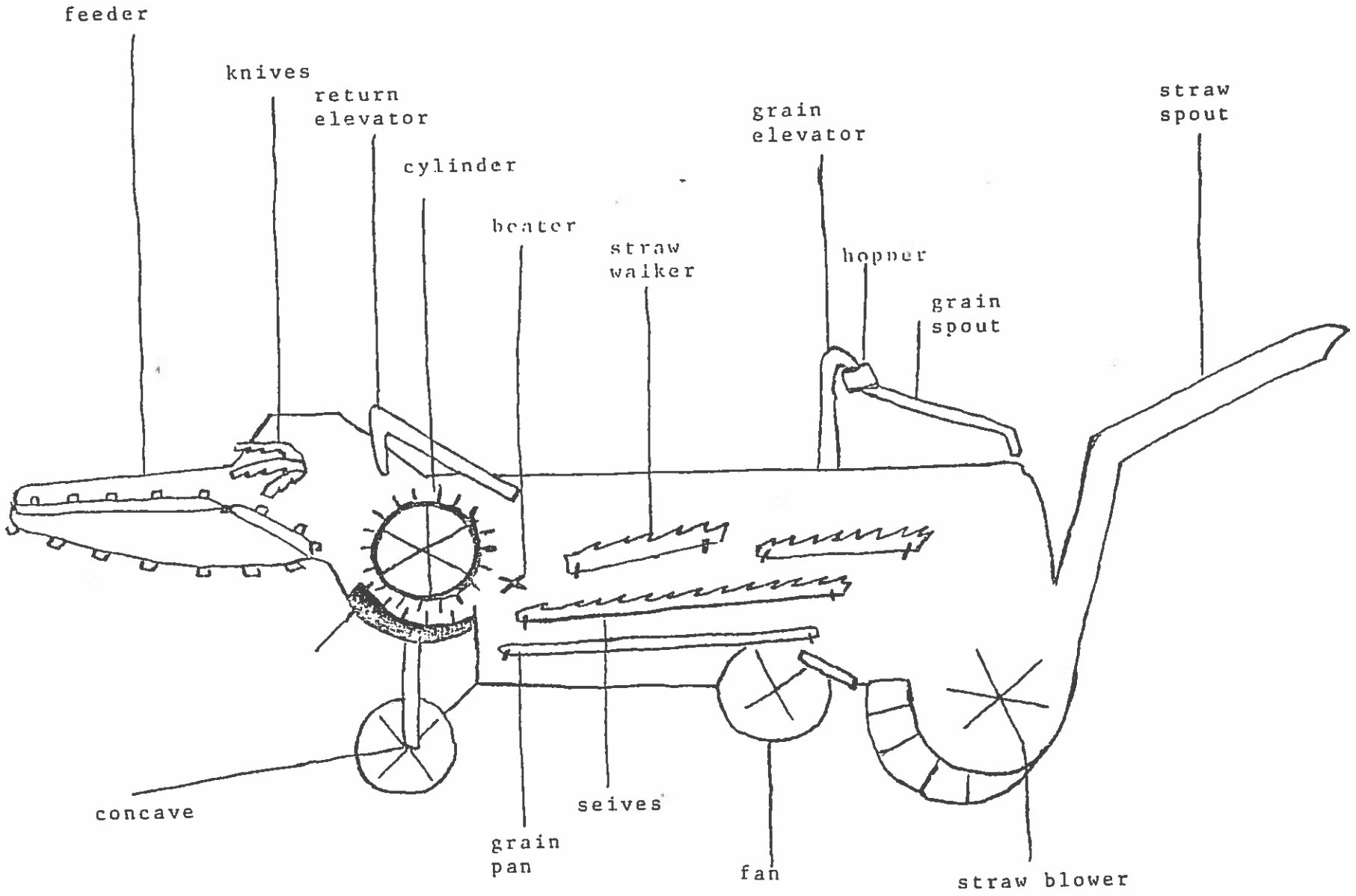
The larger crews consisted of the following:

* a steam engineer - in charge of the steam engine
* two water flunkies - responsible for keeping water in the boiler
* two firemen - responsible for stoking the fire
* a separator boss - in charge of the separator

* twelve teamsters	- each in charge of a team and bundle wagon
* two field pitchers	- to assist the teamsters in loading bundles
* two spike pitchers	- to assist the teamsters in unloading
* two grain men	- responsible for the grain tanks
* an oiler	- responsible for keeping moving parts lubricated
* two or three younger boys	- responsible for cool drinking water and running errands
* a threshing boss	- in charge of the whole operation

The separator usually started at about six a.m. which meant that the fireman was at the steam engine several hours earlier to get the steam up. An hour was allowed at noon and the machine usually stopped for the day at about seven p.m. To keep this crew operational they were fed a hearty early morning breakfast, a nourishing snack at about nine thirty, a big meal at noon, another snack at three thirty and another big meal at the end of the day. This meant that the cooks had a very

SCHEMATIC DIAGRAM OF A THRESHING MACHINE

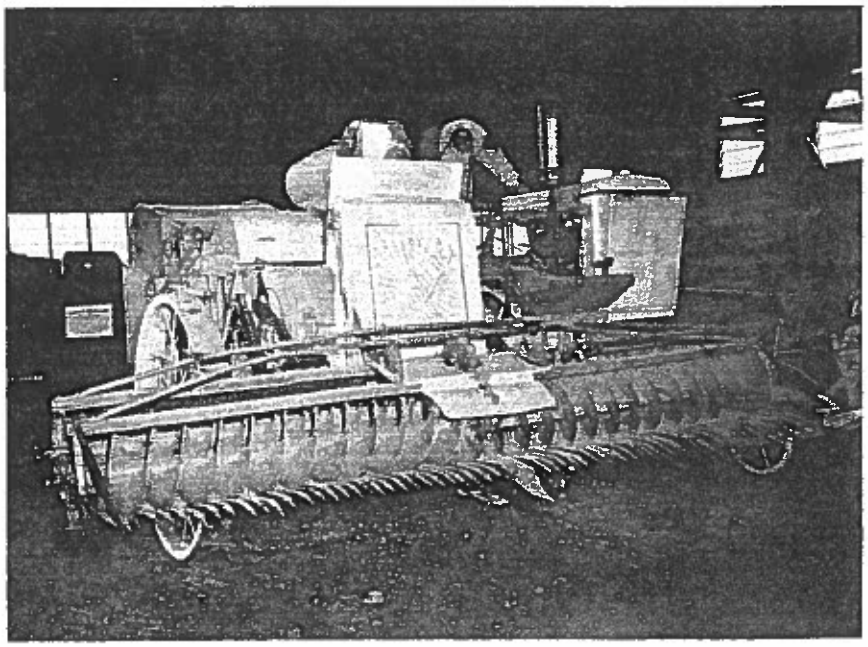


long day as they did not enjoy the convenience of refrigeration to prepare dishes ahead of time. If the family did not have several older daughters, two or three women would assist in the mammoth task of food preparation. Some threshing crews had their own cook shack and cook right out in the field.

The man power for large crews required a co-operative effort so neighbors joined forces in order to supply the men needed. Transient workers also helped swell the work force in the fall.

The size of machines changed with time and advancement so that not all crews were so large. These smaller units meant that three or four neighbors could get together to carry out the separating process. It also meant that they had greater control over when the operation would take place.

Not only did the size of the crew and machine change, but also the nature of the machines. The harvesting process was eventually combined in one machine. The "combine" was able to cut and separate the kernels of grain all in one machine. Thus the machine was taken to the wheat rather than the wheat taken to the machine. The use of the combine resulted in a decrease in the size of the harvesting crews from twenty or thrity, to four or five, and eventually to two.



The Sunshine Combine was one of the earliest attempts at a self-propelled model, that is, it was able to move across the field under its own power.

In order to speed up the ripening of the grain, a swather was developed to cut the grain and lay it in rows to allow it to cure. A pick-up was attached to the combine so that it would pick up the swath and then carry out the separation process.

The number of people required for threshing has come full cycle. The early pioneers started out with a very small work force, usually involved only his own family. Because the amount of grain harvested has increased with every change, the crew became very large, and then began to taper off. Today the whold operation can easily be done by two individuals.

2. SUGGESTED ACTIVITIES

a. Interview a pioneer to discover facts about the
   i). hours of work - days off.
   ii) number of people involved in various tasks.

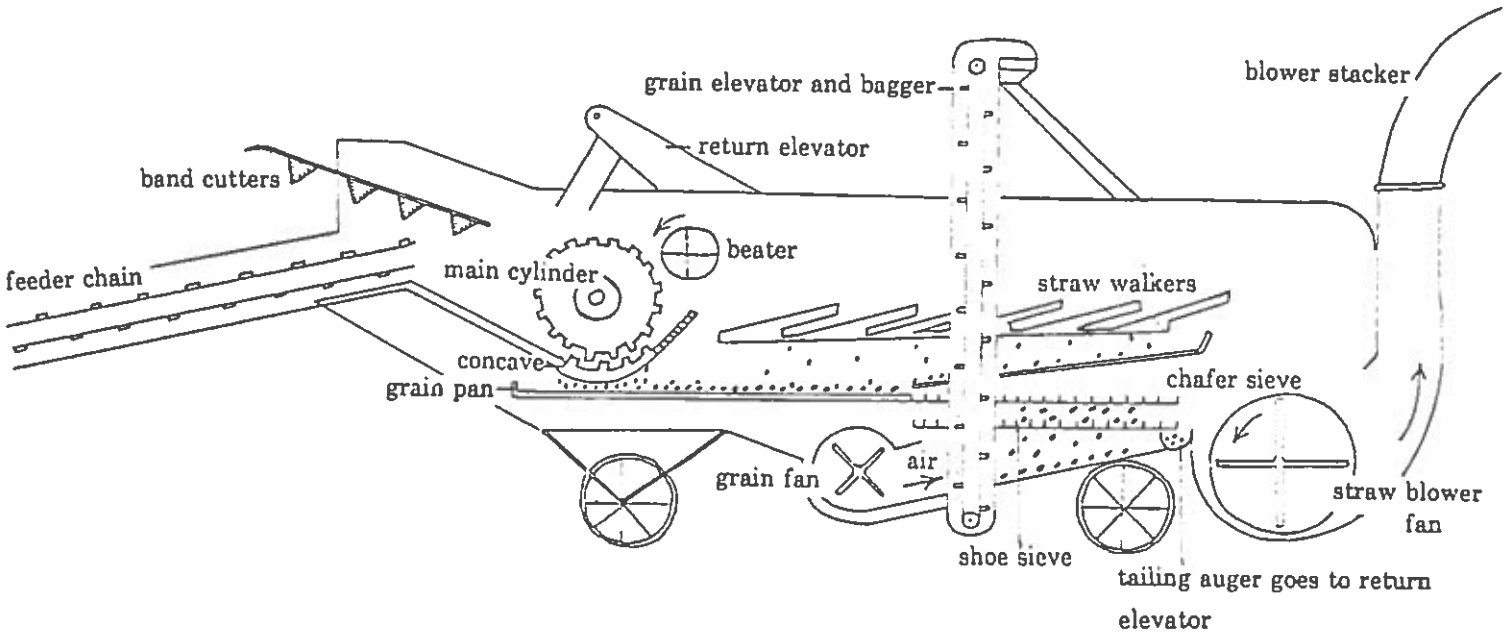
b. Discuss how the women cooked. How long did meal preparation take?

c. Make a mural showing the various stages of harvesting.

d. Write a class tory to go with the mural to show how people cooperated.

e. Find pictures of harvesting. Make a graph showing the number of people involved in each operation.

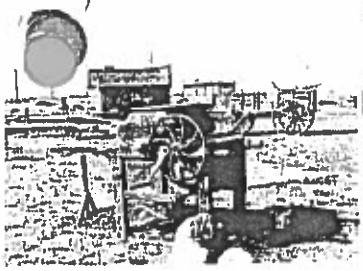
f. Using the pictures of harvesting, discuss whether it would be possible for a man to do this by himself.



How Does a Threshing Machine Work?

1. Sheaves enter by the Feeder Chain and ties are cut by Band Cutter.
2. Teeth of Main Cylinder and Concave cause kernels to be knocked out of the heads.
3. Chaff and stalk continue along Straw Walkers as more kernels drop down into the Grain Pan.
4. Chafer Sieve cleans even more chaff from the grain and chaff is blown out by the Blower Stacker.
5. Both unthreshed heads and clean grain drop down to the Shoe Sieve.
6. Grain still not threshed drops into Tailing Auger and via the Return Elevator goes through the entire threshing process again.
7. Clean grain goes up the grain Elevator, into the Bagger and then into a Weighing Device which trips every 1/2 bushel.

Threshing Photos: find the correct name for each picture



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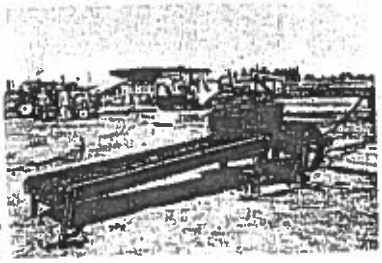

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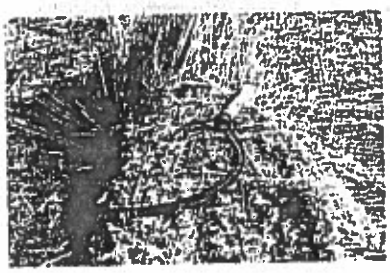

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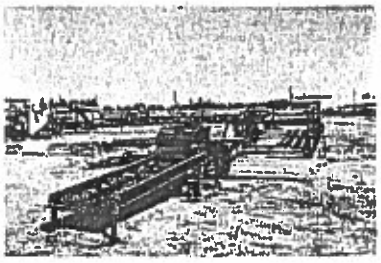

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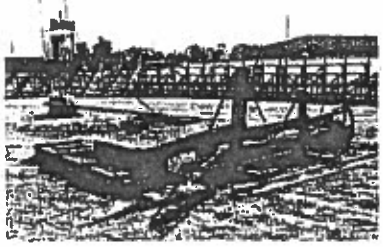

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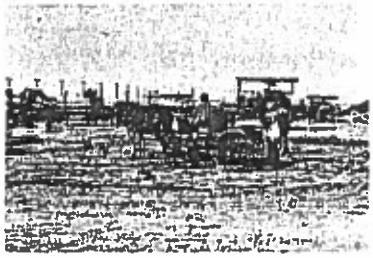

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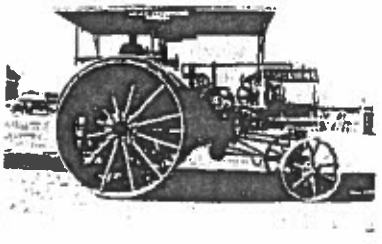

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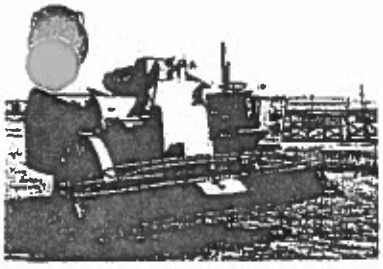

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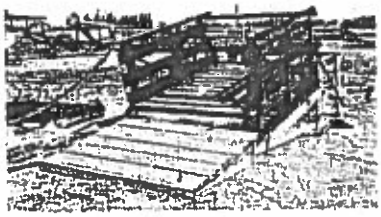

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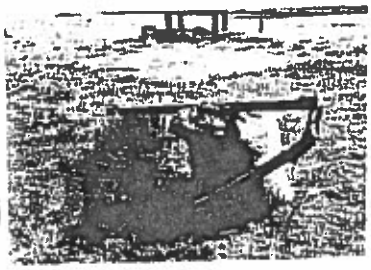

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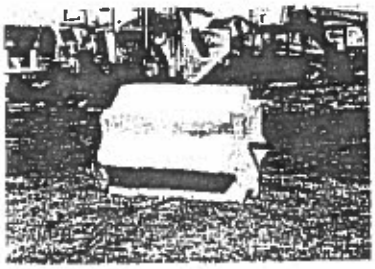

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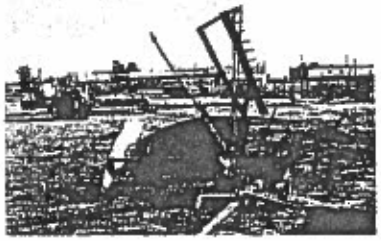

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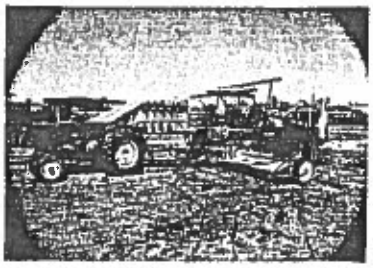

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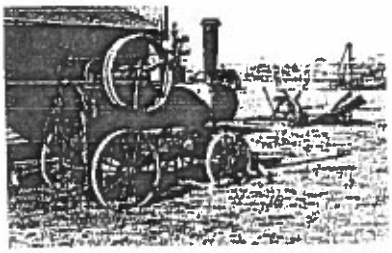

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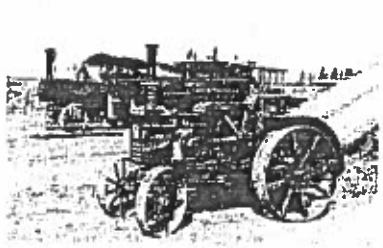

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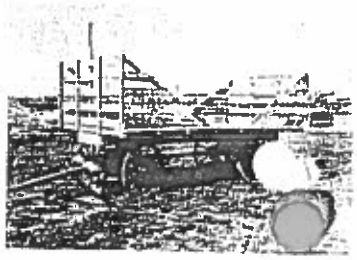

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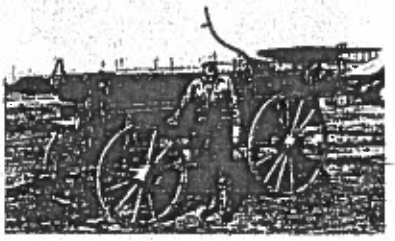

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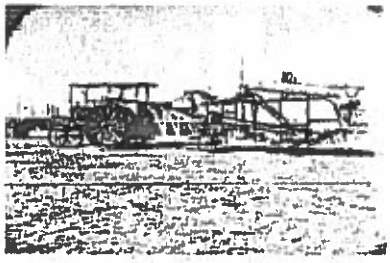

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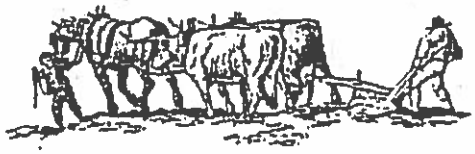


Threshing Photos

1. Sickle
2. Scythe
3. Cradle Scythe
4. Flail
5. Threshing Roller
6. Groundhog
7. Hog & Shaker
8. Hog & Shaker
9. Treadmill
10. Reaper
11. Binder
12. Stook
13. Bundle Wagon
14. Steam Engine
15. Threshing Outfit
16. Threshing In Operation
17. Grain Wagon
18. Lunch Time
19. Combine
20. Separator With Straw Walker
21. Portable Steam Engine
22. Gasoline Engine
23. Tractor
24. One-Horse Saw

Threshing Crew

Engineer

The engineer is the "head man" on the steamer. His job is to keep the steam engine in running order, and to make sure the engine has what it needs. He must have papers or permission to operate the machine. He uses the whistle to signal breaks and to tell the water, fuel and bundle haulers to hurry.

Pay: In 1907 - $70.00 per month

Tankman

The tankman's job is to make sure the steam engine has plenty of water. He fills the water wagon several times to keep the steam engine's barrels supplied. If the water level is too low it could blow both the boiler and crew right out of the wheat field.

Pay: (Wage unable to locate - estimated to be fairly low)

Bundle Men

These men drive the bundle wagon across the field from stook to stook so that the field pitchers can load the bundles onto the wagon. Then they take these wagons to the separator.

Pay: In 1907 - $3.00 per day

Separator Man

The separator man must keep the separator in running condition. He must make sure the machine is oiled and the belts have the correct tension. He also gives orders to the crew - when to bring the sheaves, how quickly to load the sheaves and when to belt up. Only the separator man and the engineer can stop the operation.

Pay: In 1907 - $50.00-$60.00 per month

Fireman

The fireman must rise early in the morning. He must clean the pipes in the steam engine, lay the fire, kindle it and nurse the engine until it has built up steam.

Pay: In 1907 - $50.00 per month

Grain Haulers

These men make sure there is always an empty wagon onhand to receive the grain. They also hauled the grain to the farmer's storage bin, and unloaded it quickly so they could make it back in time to receive the next load of grain.

Field Pitchers

The fiekd pitchers walk across the field from stook to stook and loaded the bundles onto the bundle wagons.

Pay: In 1907 – $2.25 per day

Spike Pitchers

The spike pitchers have to unload the bundles from the wagons onto the separator using pitch forks. They have to make sure the heads of the grain go into the machine first. They alsa have to make sure the bundles aren't put in too fast or too slowly.

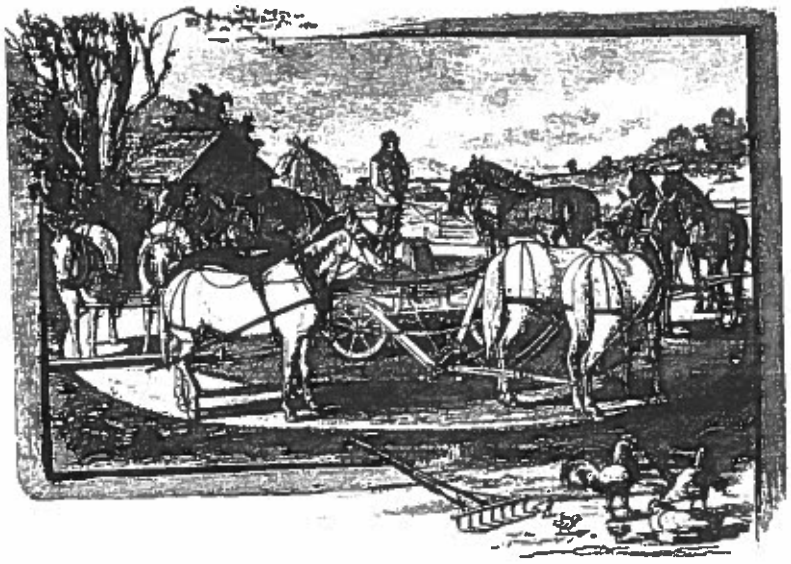
Pay: In 1907 - $2.50 per day

Women

The women were the first ones up in hthe morning. Their days were spent cooking and cleaning. They had to prepare breakfast, dinner and suypper for all the men on the crew. They often prepared sandwichess for the morning and afternoon breaks too.

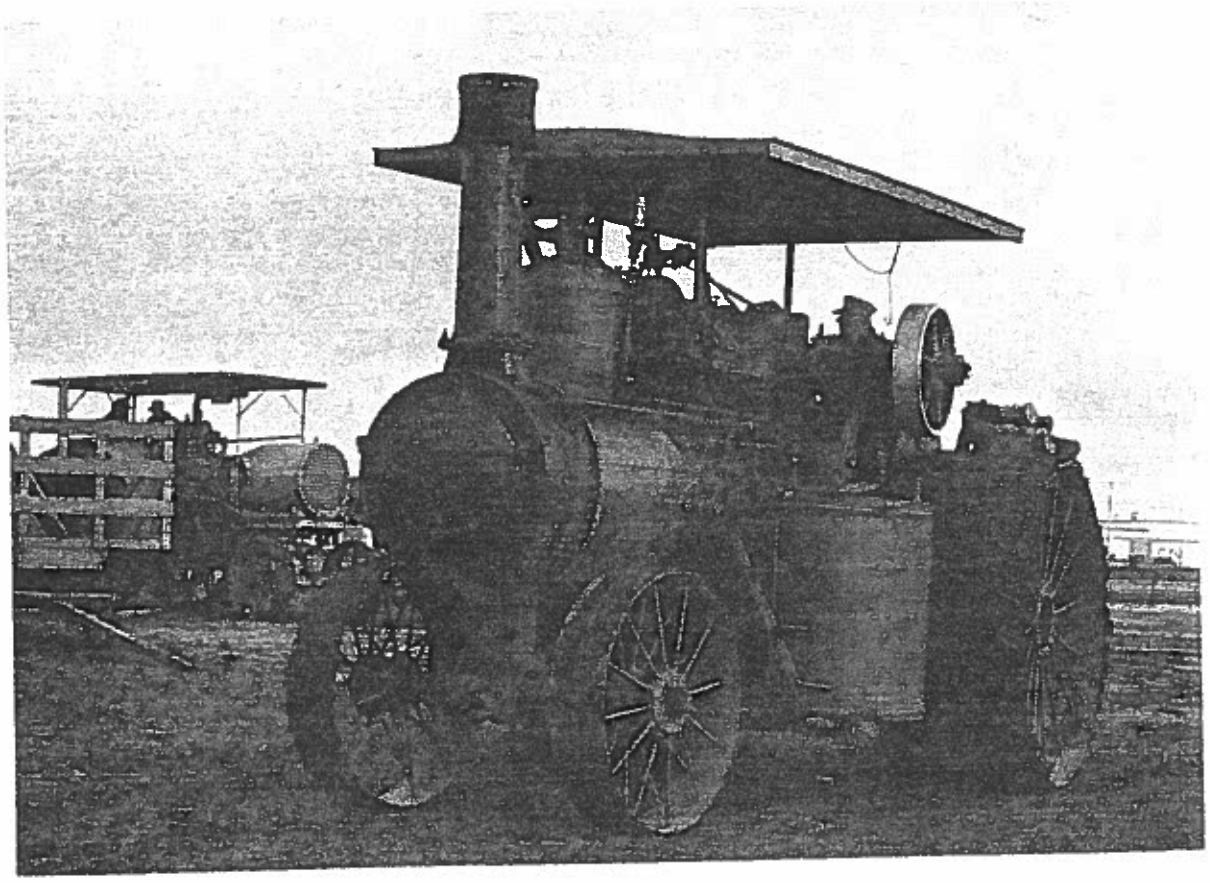
Children

The children were kept busytoo. They did the chores - looked after the cows, horses and chickens - while the men were threshing. They also ran errands, took lunches, messages and drinking water to the crew in the field.



Horsepower by Means of a Sweep

Steam power ushered in a whole new era in the pioneer years. These machines were huge and had almost a majestic character about them. These fifteen to twenty ton giants lumbered along at a slow but steady pace of about three km/hr. Even so, they were known for their quiet efficiency. The engineers, who required steam papers, were able to communicate freely using the steam whistles. In describing the power of these units two numbers were always used.



IV. THEME D - HARVESTING REQUIRED DIFFERENT TYPES OF ENERGY

A. What were the different ways the grain was moved?

B. What were the different kinds of fuel used to run the machines? Where were these obtained?

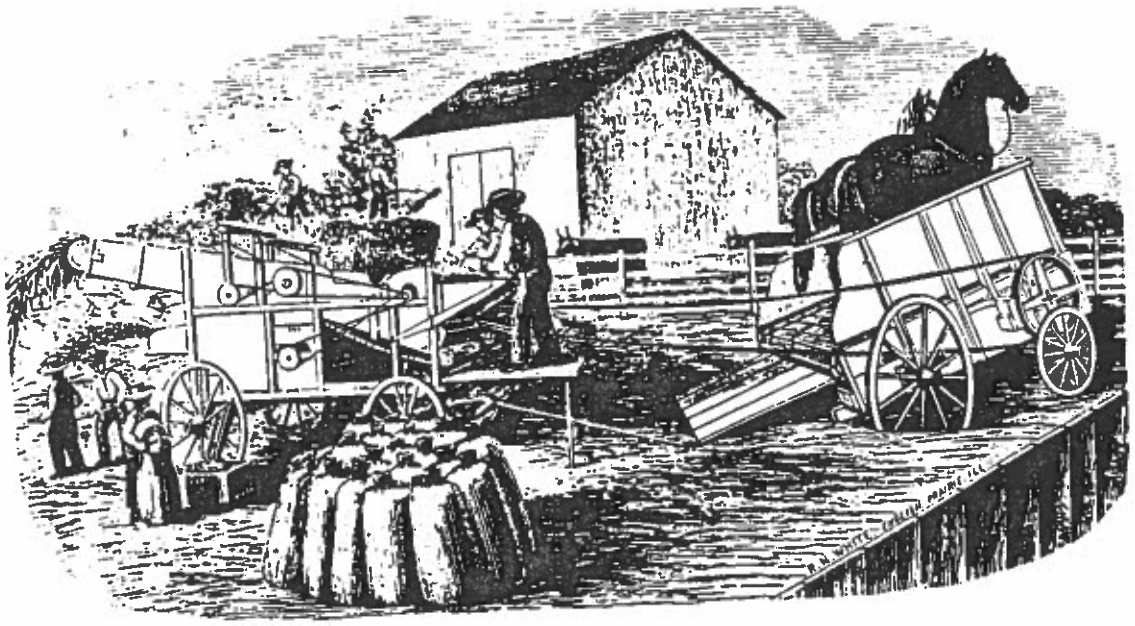
C. What were the different types of energy used?

1. BACKGROUND INFORMATION (THEME D)

a. Evolution of Power

The development of the prairies could be characterized by the changes of energy forms used to accomplish the variety of tasks. In the early years much of the energy output came from man as he worked with hand tools.

Horses were utilized to provide energy not only for pulling but also on a treadmill or a sweep. Both of these machines transferred the energy of the horses to power on a pulley.



Horsepower by Means of a Treadmill

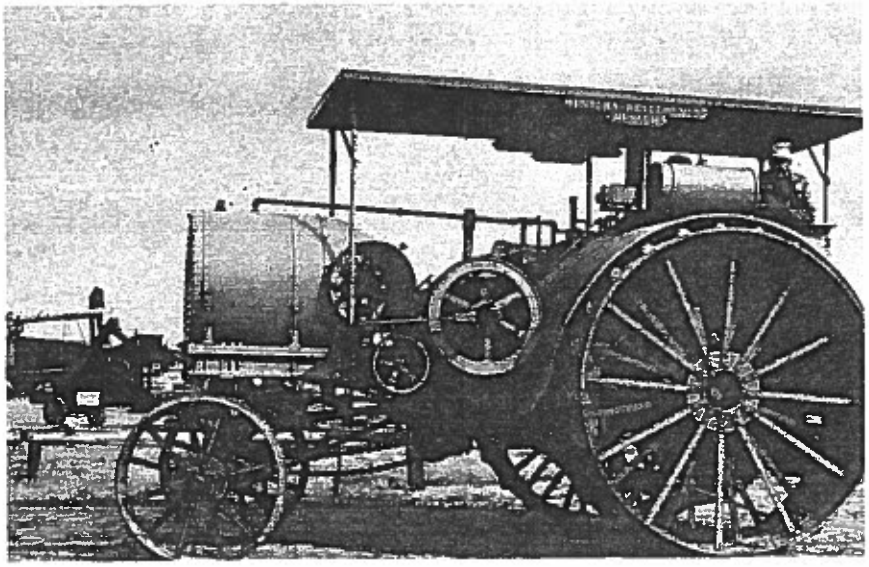
This meant that machines that were powered by hand could now be run longer, and likely at a steadier rate.

For example, a 25-75 H.P. Gaar Scott engine could generate the same amount of power as twenty-five horses and the draw-bar (pulling power) and the belt power was equivalent to seventy-five horses.

Steam engines were not without their problems. First of all, they required a crew of at least three for effective operation. The engineer, the fireman, and water boy were all needed to keep it going. Second, it needed water and fuel. Third, the danger of fire from a hot fire box and boiler certainly had to be considered. In early years cost was also a factor. In 1913, a 25-75 H.P. Gaar Scott engine was priced at between $2300 and $2800.

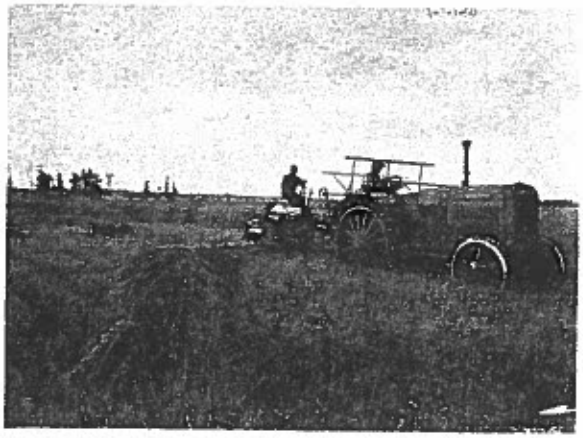
The discovery of petroleum led to the development of the internal combustion engine.

Kerosene, diesel fuel, and gasoline were all used as fuel in various models. Although the earliest models of these tractors were of a size smaller to the steam engine, smaller models soon began to make their appearance. With farm help in short supply during the First World War, these lighter tractors



offered an attractive solution. Only one man was required to operate this unit as they did not have to content with the fire-boxes and boilers. Steel tires were used on both steam and gasoline tractors until the 1930's when the rubber tire was introduced. The rubber tire allowed for a more comfortable ride and greater traction on all gasoline tractors, particularly the smaller ones which were moving at a much faster rate than the earlier models.

The increased economy and efficiency of the gasoline tractor had a strong appeal, and signs of mechanical change were clear in the second decade of the twentieth century. The place of the steamer in threshing declined. As farmers began to acquire their own small gasoline tractors, they



found it to their advantage to have their own small threshing separators and become less dependent upon the big travelling outfits.

2. SUGGESTED ACTIVITIES

a. Bring a model steam engine to school and discuss its operation.

b. Boil some water in a kettle and experiment with the force of the steam.

c. As you tour the Western Development Museum list all of the machines that would pollute the air.

d. Find pictures of horses doing farm work.

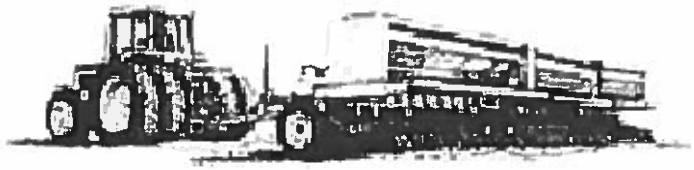
e. Discuss with a pioneer the importance and care of horses.

f. Compare the advantages and disadvantages of the use of horses as opposed to the use of steam and gas engines.

FARM MACHINERY

The farmer needs a wide range of tools and machines - for loosening the soil, getting rid of weeds, planting, mowing and harvesting the crops.

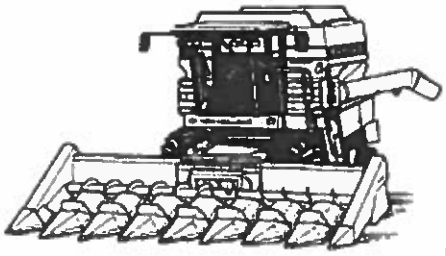
There are specific machines designed for the different crops that are grown on farms. Some are designed for grain crops, while others are designed to plant and harvest potatoes, lentils and other crops.



- TRACTOR - the work horse of the farm; tractors pull farm implements and are used for many tasks.
- CULTIVATOR - has blades or shovels that work up the soil without turning it over; is pulled between rows of plants to kill the weeds.
- DISKER - kills the weeds and smooths the soil; metal plates dig deep into the soil
- HARROW - has iron teeth or spikes; it breaks up clumps and smooths out the soil
- DISK HARROW - a harrow that turns and loosens the soil; has rolling saucer-shaped metal plates that are set on an angle to dig deep into the soil
- DRILL (seeder) - plants seeds ; a shovel cuts a trench in the soil, the seed falls into the trench and loose soil covers the seeds.
- AIR SEEDER - has separate tanks for seeds, fertilizer and herbicides.
- SPRAYER - used for liquid herbicide or insecticide; solution is sprayed through nozzles.
- SWATHER - (windrower) cuts down the crop and lays the plants in a swath on top of the stubble.
- COMBINE - picks up the swath, separates the seeds from the stems and throws the straw back on the field
- AUGER - a long metal tube (on wheels) which carries grain upward and dumps the grain into a granary or truck.
- TRUCKS - used for hauling the grain to the granaries and storage bins, or to the grain elevators.

- MOWER - cuts hay or feed crops
- BALER - picks up hay or straw and forms it into round or square bales for storage.

HARVESTING

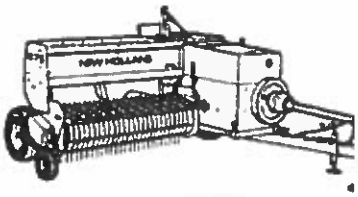


a combine

FERTILIZING

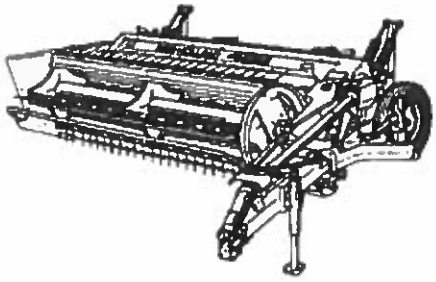
fertilizing in spring

HAYING



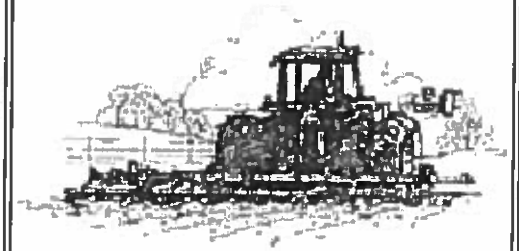
a baler

HAYING



a mower

FIELD WORK



tilling the field

tractor

Tractors, trucks and other farm implements are very expensive. A farmer's investment in land, buildings, machinery and livestock may reach over a million dollars. Seed, fertilizer (plant food), herbicides (weed control) and pesticides (insect control) must be purchased. Fuel is needed to operate the machinery.

FARMING

site with photos of farm equipment

Code of Whistle Signals

One short blast means to stop.

Two short blasts means the engine is about to begin work.

Three medium short blasts means that the engine will soon need more sheaves and the grain haulers should hurry.

One very long blast, followed by three shorter ones, is a signal that the water is low and the water hauler should hurry.

A succession of short, rapid blasts is a signal for fire or some other serious problems such as an accident.

WESTERN DEVELOPMENT MUSEUM

Measurements and Weights

bushel	=	35.239 litres
mile	=	1.609 kilometres
foot	=	30.48 centimetres
square mile	=	2.590 square kilometres
acre	=	4047 square metres
horsepower	=	745.7 watts
hectare	=	1000 square metres
1 pound	=	.4536 kilograms

SASKATCHEWAN WESTERN DEVELOPMENT MUSEUM

Modern Day Farming Equipment/Machinery

Match the picture and description to the farm machinery: **swather, tractor, disker, grain truck, cultivator, harrow, drill seeder, combine**

1. _____

has blades or shovels that work up soil without turning it over is pulled between rows of plants to kill the weeds

2. _____

picks up swath, separates the seeds from the stems and throws the straw back on the field

3._____

has iron teeth or spikes, it breaks up clumps and smoothes the soil

4. _____

is used to haul, pull other equipment and has many tasks on the farm

*** The farmer needs a wide range of tools and machines-for loosening the soil, getting rid of weeds, planting, mowing and harvesting the crops**

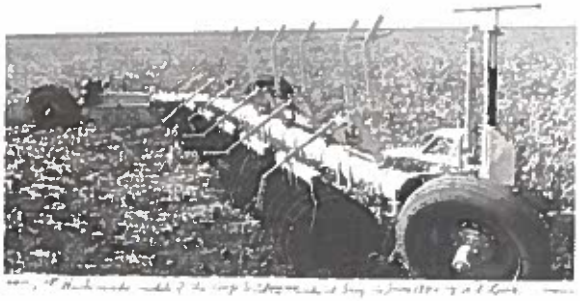
5. _____

is used for hauling the grain to the granaries and storage bins, to the grain elevator

6. _____

plants seeds, a shovel cut a trench in the soil, the seed falls into the trench and loose soil covers the seed

7. _____



kills the weeds and smoothes the soil; the metal plates dig deep in the soil

8. _____

cuts down the crop and lays the plants in a swath on top of the stubble

*Here are specific machines designed for the different crops that are grown on farms. Some are designed for grain crops, while others are designed to plant and harvest potatoes, lentils, and other crops.

Activity -2

MACHINERY TIME LINE

Aultman & Taylor Machinery Co., Mansfield, Ohio

1867 — originated by Cornelius Aultman and Henry H. Taylor as Aultman, Taylor & Company.

1892 — firm reorganized as Aultman & Taylor Machinery Company.

1910 — gas tractors added to farm machinery offered.

Jan. 1, 1924 — Advance-Rumely took over Aultman-Taylor because of financial difficulties.

Deere & Co.

Feb. 7, 1804 — John Deere born Rutland, Vermont

1837 — Deere built first steel plough, using steel from a discarded sawmill blade.

1842 — built 100 plough this year, production increased.

1852 — 4000 plough per year produced; grain drill added.

1875 — Gilpin Moore patented a sulky plow for Deere.

1912 — farm tractors added to the line.

1918 — Waterloo Gasoline Engine Co. bought by Deere for $2,100,000.00 with complete line of proven tractors.

1924 — popular Model D was brought out by Deere.

1934-1952 — Deere's most popular Model A tractors were built.

1949 — first diesel tractor put out.

1949 — several different models of the diesel tractor developed by John Deere co., all the ultimate in engineering and performance.

1952 — first numbered tractors came out, the "50" and "60".

1953 — the "70" series came out.

1956-58 — the "20" series came out of Deere factories.

1958 — 60 — the "30" series built.

1960 — Deere abandoned the 2-cylinder models and introduced a four-cylinder series.

1963-72 — "power shift transmission" built in 4020 models.

Reference: **Encyclopedia of American Farm Tractors** by C. H. Wendel, Crestline Publishing Co. Ltd., Florida.

Changes in Farming Practices

1. The **reaper**- was the first machine to cut the grain. Horses pulled it. It did the same amount of work as four cradles.
2. The **binder**- was invented a bit later. It was similar to the reaper, but it also tied the stalks of grain into sheaves with **wire**. Later, **binder twine** was used.
3. The **groundhog**- was a machine invented to thresh the grain. This means that it separated the grain kernels from the straw and chaff. It replaced the flail. It took 4-6 men to operate it.
4. The **separator**- was invented to thresh the grain. Horsepower to run the separator replaced manpower. Horses walking on a treadmill gave this power.
5. **Horsepower**-was later replaced by the steam engine. The steam engine got its power from burning wood or coal. The steam engine was hooked up to the separator. Threshing crews were very large, usually 30 people.
6. **Gasoline engines**- replaced the steam engine. The gasoline engine required fewer men to do the threshing process. The wheels of early tractors and other machines were made of steel. Later, wheels were made of rubber this gave a much smoother ride.

7. In **today's farming**- farmers use a **swather** usually bulled by a tractor to cut the grain and lay it into row.

8. Today, farmers use the **combine** for threshing the grain. The combine picks up the grain and separates it so that only the kernels are left. The combine requires only one person to operate it. Another person is needed to drive a grain truck to collect the grain.

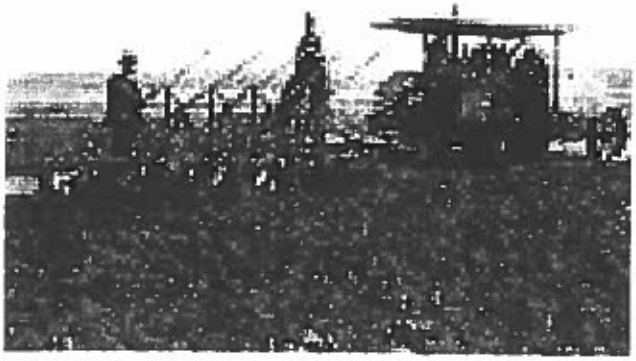
Harvesting Required different Types of energy : the evolution of power

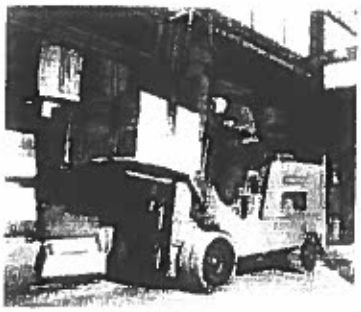
1. Describe the early farming techniques that used "horse-power" and early machinery.

2. How did "steam power" change life for farmers?

3. **What were the 3 downfalls of using steam engines or steam power?**

4. **How did the invention of gasoline (kerosene and diesel fuel) make improvements on farming even further?**





TOWMOTOR