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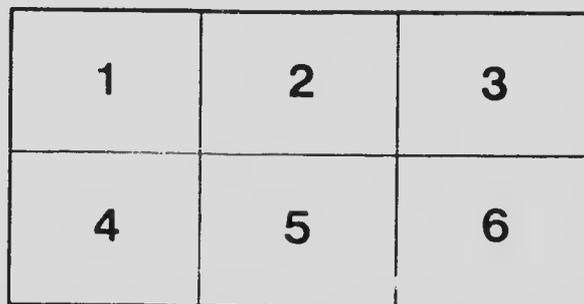
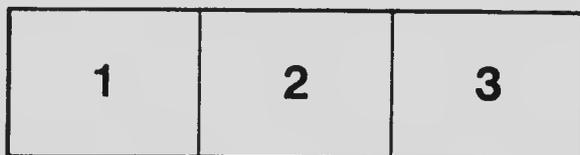
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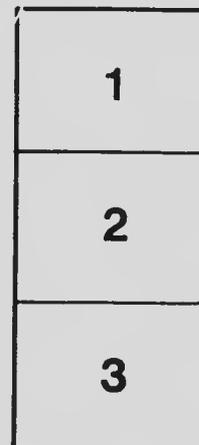
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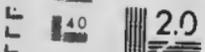
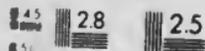
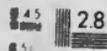
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# UNIVERSITY OF SASKATCHEWAN

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## Corn Growing in Saskatchewan

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### Corn Growing in Saskatchewan.

The conditions which favour the growing of corn to its greatest perfection are high temperature and long growing seasons. Cool nights, and frosts in late spring and early fall therefore impose serious restrictions upon its use in northern latitudes. But while corn is a warm climate crop the continued selection of specially adapted early maturing types has resulted in the limits of successful corn-growing being pushed farther and farther northward. Corn has now a permanent place on the majority of farms in the northern states and it is growing in favour every year in the western provinces. While the season is not long enough to permit of profitable grain production, it has been demonstrated conclusively that corn can be grown successfully as a forage crop. **As a substitute for fallow it will doubtless have a useful place in most of our wheat farming districts.**

### The Four-Fold Value of the Corn Crop.

Corn may be grown profitably in Saskatchewan as a forage crop, a cleaning crop, a substitute for fallow and as a means of lessening the cost of producing wheat. All four purposes are served at the same time.

**Corn as a Forage Crop.**—Under average conditions corn produces very fair returns. Yields of forage varying with the season and the culture given from 8 to 20 tons green weight per acre have been reported from different parts of the province. In the least favourable season during the past five years at Saskatoon corn produced eight tons green weight per acre. In other years the yield has been as high as fourteen tons per acre. At Indian Head the average yield for some of the leading varieties for a period of five years is over seventeen tons of green weight per acre. Even when we allow for the large amount of water that green corn contains these yields compare very favourably with those of any other forage crop that we can grow. Ten tons of green corn cut when the cobs are partly formed is equivalent to about 2 tons of cured fodder.

**Corn as a Cleaning Crop.**—Weeds constitute the most serious hindrance to profitable grain farming in the older settled parts of the province and are already proving a menace in the newer sections. Continuous grain growing is impossible unless adequate means are found for keeping the land clean. Corn is one of the best crops for this purpose. The thorough culti-

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vation necessary for the successful production of corn aids materially in the control of weeds and thus offers another means for coping with a very difficult problem.

**Corn as a Substitute for Fallow.**—The summerfallow is admittedly an expensive method of controlling weeds and conserving moisture, in that a considerable part of the cultivated land is bringing in no returns. Besides the fallowed land provides the best possible conditions for soil drifting, which is becoming a serious drawback to profitable crop production in many places.

By substituting a corn crop for the summerfallow it is possible to make profitable use of the land every year. A crop of forage on land that would otherwise be idle is obviously a good thing, provided it can be had without seriously reducing the yield of grain the following season. This is what actually occurs in practice if the corn land is kept clear of weeds. Wheat sown on corn ground frequently equals and sometimes exceeds the yield of the same crop when sown on fallowed land. The



A Typical Plant of an Early Flint Variety

crop on corn ground also matures earlier than that on fallowed land. Experiments at Saskatoon have demonstrated that corn may replace summerfallow without materially affecting the yield of grain the next year. The same result has been reported from the North Dakota Experiment Station, the Brandon and Indian Head Experimental farms and from many farmers as well. In some years the yields are slightly less but this is offset by an earlier and more evenly maturing crop.

In addition to doing the work of the fallow in controlling weeds and conserving moisture, corn will prevent soil drifting while the crop occupies the land, and the corn stubble, while not always preventing, will considerably lessen the drifting. And what is still more important, the manure resulting from the feeding of the corn crop will help replace the organic matter which is so essential to the control of both soil drifting and soil moisture.

#### **Corn Lessens the Cost of Producing Grain.**

The cost of producing farm crops must be kept down if farming is to be profitable. Corn ground that has been well intertilled and kept clean does not need to be ploughed, hence the cost of a cereal crop is very considerably reduced and to that extent the profit on the succeeding crop is increased. A crop of fodder has also been obtained from the land the previous season without prejudice to the grain crop that is to follow. These results, however, are not obtained unless the corn field is kept as clean as a good summerfallow. Success depends on this factor more than on any other.

#### **Uses of the Corn Crop.**

In this province corn may be grown either for fodder, for soiling purposes, for "hogging off," or for silage. The form in which it is generally used at the present time is as cured fodder for cattle. For soiling purposes, however, dairy farmers will find it to be unexcelled for milk production in the dry part of the summer when the pastures have dried up. The "hogging off" of early maturing corn in the warmer parts of the province, while not yet practised to any extent, promises to aid materially in cheapening the cost of producing hogs as well as in lowering the cost of crop production.

Corn is the most suitable silage crop we have. In this connection it should be pointed out that a cheap form of silo, and one that in the western states is now being used quite extensively—namely the pit silo, is likely to fill the early need of the small stockman quite satisfactorily.

The early varieties of corn have ripened in the southern parts of all three prairie provinces. A few men have seldom failed to get seed sufficiently matured to grow. But as a grain crop, however much the future holds for us, at present it is not a commercial success except in local areas in the south and in favourable seasons elsewhere.

#### **Corn in the Rotation.**

What has been said of corn as a substitute for fallow indicates its natural place in the rotation. As a forage crop it can be used to most advantage by replacing as much of the summer-fallow as seems practicable. In parts of Manitoba and eastern Saskatchewan, where the precipitation is sufficient, corn might

very well take the place of the fallow in such rotations as are used at present. For most of the prairie section of this province, however, the indications are that the wheat-oat-fallow rotation must be replaced in the near future by a more permanent system, including crops that will restore fibre to the soil. The following are suggested as suitable rotations of this type:

#### Rotation No. 1

1. Wheat.
2. Oats.
3. Corn.
4. Wheat (Seeded down to grass).
5. Hay.
6. Pasture.
7. Fallow.

#### Rotation No. 2.

1. Wheat.
2. Corn.
3. Wheat or oats (Seeded down to grass).
4. Hay or pasture.
5. Fallow.

Rotation No. 2 is a shortened form of No. 1, requiring less time to complete and fewer fields. It is recommended for the drier parts of the province where moisture conservation is of most importance. Those who for any reason do not wish to depart from the wheat-oat-fallow plan would do well to plant corn on a few acres of the fallow with a view to testing out its merits and getting familiar with the crop.

Fall or spring ploughed stubble makes a better seed bed for corn than freshly broken sod and the land may be summer-fallowed after grass with practically no danger of soil drifting.

#### Favourable Soil Conditions.

Corn prefers a warm soil. Other conditions being similar it will start earlier and grow faster on a rich loam soil than on any heavier type. In our climate, however, it has been commonly observed that, except in years of early fall frosts, corn produces a much heavier growth of forage when planted on low lying soil that is well supplied with moisture. A light, warm soil under similar condition would, no doubt, yield more. The crop needs both a warm and a moist soil. Where grain is desired warm soils are essential, but where forage only is looked for, while warm soils are favoured, the crop will do well on all except the coldest types.



A Profitable Field of Corn Replacing Part of the Summerfallow.  
Gull Lake, Saskatchewan, 1920.

### Preparation of the Land.

If stubble land is grassy, fall ploughing is preferable; if it is clean, thorough surface cultivation in the fall, followed by spring ploughing, well worked down immediately after the operation, is likely to prove satisfactory in the average season. If planted on fall or spring ploughing the land should be well firmed and the surface thoroughly cultivated. Well rotted manure will prove advantageous, either top dressed or ploughed under. Strawy manure, if used, should be ploughed under and thin spreading is essential. Four to six tons per acre is sufficient. Thorough preparation of the surface soil is more essential for the corn crop than for any other cereal.

### The Choice of Varieties.

Of the many existing varieties of corn, comparatively few are suitable for Saskatchewan conditions. The late dents and late flints are lacking in hardiness, generally low in yield and on account of their immaturity at harvest make an inferior quality of silage. The remaining types of corn may be divided into three groups,—(a) squaw; (b) early flint and improved squaw; and (c) early dent.

**Squaw Corn.**—The squaw varieties are short and relatively low in forage yield, but are very early in maturing, usually producing ripe seed in 85 to 95 days from the time of planting. Squaw corn is used chiefly for grain or hogging off. Recommended varieties are Squaw, White Squaw and Assiniboine Indian.

**Early Flints.**—The early flints or improved squaws are taller, later and much heavier in yield than the squaws. The ears mature in 100 to 120 days. Varieties that have proved the most valuable in Saskatchewan for forage or silage purposes are Dakota White, Gehu, Quebec No. 28 and Burleigh County Mixed.

**Early Dents.**—The early dents are similar to the early flints in height and yield, but are later in maturing. Northwestern Dent, which matures in 120 to 130 days, is the most popular variety.

Results obtained at Saskatoon from tests made over a period of eight years are given in the accompanying table. The figures show that the early flints have produced a slightly higher average yield than the early dents. In favourable seasons with no frosts early in September the early dents gave the largest returns, but in seasons with cold springs and early fall frosts the early flints were noticeably higher in yield.

**Table Showing Yields of Corn at Saskatoon During the Period 1913 to 1920.**

Group (with the number of varieties and strains tested)	YIELDS IN TONS PER ACRE GREEN WEIGHT									Average Yield 1913-1920	
	1913	1914	1915	1916	1917	1918	1919	1920	Green Weight	Dry Weight	
Squaw (7)	3.5	..	1.7	10.2	4.7	..	1.9	7.3	6.0	1.5	
Early Flint (16)	6.0	8.1	18.1	18.7	7.4	12.2	10.7	8.9	10.2	2.0	
Semi-Dent & Early Dent (22)	5.0	9.0	15.7	10.4	4.0	10.8	10.8	9.2	9.7	1.9	
Late Flint (12)	7.5	9.4	15.2	12.0	6.2	12.7	10.8	9.8	10.4	1.5	
Late Dent (34)	5.0	..	11.9	9.7	5.3	8.1	8.4	8.2	7.9	1.1	

Note: The yields of cured fodder, as given in the last column, were calculated from the green weights taking into account the average stage of maturity of each corn group at harvest time. This is a truer measure of the actual feeding value obtained from an acre than the green weight.

### Testing the Seed.

The percentage and vigour of germination of the seed should be determined before planting. This information, which for corn is more important than for any other crop, can be obtained easily and quickly by either the blotting paper or the soil method of testing. Seed that does not give a high germination test (90% or over) should either be discarded or a larger quantity used.

In this connection it should be pointed out that in all corn growing regions the practice of buying the seed on the ear is often followed. On those farms where corn is used in a large way and planted in hills it is advisable to purchase the seed on the ear. Ear corn sold for seed has generally received more or less selection. Such seed is likely to be higher in price, but the percentage and vigor of germination will invariably more than offset the additional cost.

### Planting the Crop

**Date of Planting.**—The nearer corn can be brought to maturity before fall frost the better will be the quality of the fodder or silage produced. Early seeding gives a longer period of growth and in that respect is desirable, but early planted corn frequently does not get along well owing to two causes:

1. If the soil is cold part of the seed may rot and the remainder germinate very slowly, causing a poor stand.
2. Late spring frosts often give early planted corn a severe setback.

In seasons free of late spring frosts the May 10 seeding at Saskatoon produced more forage than any later planting. In 1915, when a severe frost came in June, the May 30 seeding was the best. The largest average yields during an eight year test were from the May 20 and 30 plantings. Corn planted later than this was lower in both yield and quality. The usual practice is to sow during the last week of May. In the southwestern portion of the province the danger from frost is less and corn may be planted there a week or two earlier.

**Method of Planting.**—Corn is planted either in rows with an ordinary grain drill or in hills with a corn planter. In this country the most forage is usually secured from seeding in rows. Another advantage of this method is that it does not require the purchase of a new implement. Furthermore, it is the quickest way. To prepare a seeder for planting corn, block up six out of seven seed outlets, or better still, place a cardboard hopper or a large tin funnel over every seventh opening in the drill box.

Where grain is the object sought, the hill method should be used, as corn, unlike wheat, matures most rapidly when given plenty of room. Hill planting or checking is especially desirable on weedy land, for it gives opportunity for tillage in two directions—both lengthwise and across the rows. Checking corn requires the use of a hand planter or else the purchase of a corn planter. This outlay is partly offset by the saving in seed.

**Distance Apart of Rows.**—Experiments conducted for eight years at Saskatoon indicate that rows planted close together give the largest yields but are the highest in the cost of weed control. The net profit was greatest when the rows were from 3 to 4 feet apart. With hill planting the highest net returns were produced from hills 3 feet apart each way. Because of the greater ease and thoroughness with which the crop can be cultivated and kept clean it is advisable to have the rows  $3\frac{1}{2}$  feet apart or the hills  $3\frac{1}{2}$  feet apart each way.

**Rate of Planting.**—When corn is planted in rows  $3\frac{1}{2}$  feet apart, about 20 pounds of seed per acre is sufficient. At this rate the kernels should drop about five or six inches apart in the row. It is a good plan to test the drill on a piece of hard ground before commencing to seed.

When hill planting is used, 8 to 12 pounds of seed is required per acre, varying with the distance apart of the hills and the size of the seed.



Drying Seed Corn in Saskatchewan.  
A Variety Test at Saskatoon in 1919. North-Western Dent at the left, Squaw in the two centre rows, and Dakota White Flint at the right.

### Cultivation

After corn is planted and until the crop is 6 inches high it may be harrowed with a light harrow. This practice is necessary in order to kill the thousands of small weeds that on most soils are sure to spring up. Harrowing once or twice before the

corn is 6 inches high should be looked upon as a necessary operation. If the harrowing is done on a warm, sunny day, the young corn plants being somewhat wilted, pass between the harrow teeth without appreciable injury.

After the crop is high enough that the rows are clearly distinguishable intertillage should commence. The first cultivation may be fairly deep and close to the young plants, but later cultivation should be shallow. The more cultivation the crop is given up to the time when it is impossible to get the horse or horses through between the rows the heavier the crop will be and the better condition the land will be in for the following crop.

If small areas only are planted to corn the one-row cultivator is quite satisfactory. For larger areas, however, a two-row machine will quickly pay for itself in the saving of one man's time.

### Harvesting

The time to harvest the crop should be determined first, by the maturity of the crop, and, second, by the probability of fall frosts. As a rule, in this country, the crop should be left as long as possible and yet avoid frosts. We have in the past usually cut our corn at Saskatoon in the first ten days of September. Occasionally frosts occur before this date, but sometimes they do not come until considerably later. A slight frost usually stops the development of the crop, without seriously injuring its feeding value. As a matter of fact, when corn is very green and immature a slight frost results in drying it out to some extent, and thus makes the fodder easier to cure. It also makes green immature corn less moist and the silage from it less sour. In all cases where corn is caught by frost it should be cut as soon as possible. When frosted corn is left standing the plants rapidly dry out and much of the feeding value is lost through weathering.

The harvesting may be done with the sickle, the binder, or the corn harvester. The first is the most laborious, and is advisable only when the crop is grown in a small way. The second plan is quite satisfactory in most seasons. When corn is grown in large areas, and particularly if the crop is heavy, a corn harvester should be used.

A possible development for corn lies in its use as a pasture crop for cattle in fall or early winter. This practice has not been extensively studied in Saskatchewan, but some men have reported favourably upon it. The difficulty and cost of the harvesting which comes at a very busy time would be lessened, but whether the net return would be worth the effort has yet to be determined. By this method there is some danger of loss of stock due to forage poisoning or over-feeding.

### Curing and Storing

Depending upon the uses to which it is to be put, the corn crop is cured in different ways. That used for soiling purposes is, of course, cut green and fed in that condition. If it is to be used as roughage for stock it is cured by shocking it in the field.

Corn is sometimes left stooked in the field until needed and then drawn to the stable by the sleighload. A better method is

to have it near the buildings in long ricks. These ricks should run east and west to allow the snow to be carried through by the prevailing winds and not banked up against the corn.

Fodder corn should not be stored in lofts or stacks unless layers of dry straw are placed between the layers of corn bundles. The layers of straw should be three or four times the thickness of the layers of corn, and the twine on the corn bundles should be cut. The straw absorbs the moisture and prevents heating. This straw comes out of storage so flavoured by the corn that cattle eat it readily.

When stacked alone the corn should be well cured in the shocks, and the ricks or stacks must be made quite narrow to prevent spoiling. Some men have found that piling the cured bundles like cord wood is quite satisfactory.

The ideal way of storing fodder is in the silo. There are many types of silo, but all of the "above ground" types are rather expensive and at the present time can only be recommended for those having dairy farms or a considerable number of growing or fattening cattle. The "pit" or "underground silo" is much less expensive, and although less convenient, it promises to lend itself better to the conditions that exist on many western farms than does the more expensive "above ground" type.

#### **Equipment Necessary**

When corn is grown for fodder only, no equipment other than the grain drill, the one or two-horse cultivator and the grain binder is required at first. If after the crop has been tested thoroughly it is found to be satisfactory a horse drawn, two row planting machine, or a two-horse cultivator, or a corn harvester, or all three may be purchased. These machines save a great deal of time and may be used for other purposes as well as for handling the corn crop.

#### **Summary**

1. Corn is a warm climate crop growing slowly in cool seasons and is easily affected by frost.
2. The average yield of corn for the past eight years at Saskatoon is over 11 tons green weight (or over 2 tons dry weight) per acre. At Indian Head, corn yielded an average of 17 tons green weight per acre over a period of five years.
3. Corn is our most satisfactory intertilled crop and offers a profitable means of controlling weeds.
4. Corn is a successful substitute for the summerfallow and when used as such materially aids in lessening soil drifting.
5. Corn lessens the cost of producing cereals.
6. Corn is used for winter fodder, silage, pasture, more particularly for hogs, and as a soiling crop.
7. Corn prefers a warm, moist, fertile soil.
8. A promising rotation for the drier parts of Saskatchewan consists of (1) wheat, (2) corn, (3) wheat or oats seeded down to grass, (4) hay or pasture, (5) summerfallow.

9. The squaw varieties are most useful for grain or hogging off.

10. For fodder or silage production the early flints give the best results. Recommended varieties are Dakota White, Gehu, Burleigh County Mixed and Quebec No. 28.

11. Before planting, the seed should be tested for germination.

12. Averaging the results of an eight year test at Saskatoon, the largest returns were produced by corn planted during the last 10 days of May at the rate of 20 pounds of seed per acre.

13. Rows  $3\frac{1}{2}$  feet apart have been found to be most satisfactory.

14. When hill planted only 8 to 12 pounds of seed per acre are required.

15. Hill planting or checking corn is the best for weed control.

16. Corn requires cultivations to be frequent, shallow and continued late.

17. The crop should be left as long as possible and yet harvested before frost. If frosted it should be cut immediately. The grain binder may be used successfully but the corn harvester is most satisfactory.

18. Corn may be stored in long rows near the buildings, in stacks or lofts, with alternate layers of straw, or in a silo.

19. No costly equipment is necessary to start growing corn, but the planter, cultivator and binder are very desirable because of the time which can be saved by their use.



