Agriculture and Agri-Food Canada | Agriculture et Agroalimentaire Canada

ARCHIVED - Archiving Content

ARCHIVÉE - Contenu archivé

Archived Content	Contenu archive
Information identified as archived is provided for reference, research or recordkeeping purposes. It is not subject to the Government of Canada Web Standards and has not been altered or updated since it was archived. Please contact us to request a format other than those available.	L'information dont il est indiqué qu'elle est archivée est fournie à des fins de référence, de recherche ou de tenue de documents. Elle n'est pas assujettie aux normes Web du gouvernement du Canada et elle n'a pas été modifiée ou mise à jour depuis son archivage. Pour obtenir cette information dans un autre format, veuillez communiquer avec nous.

This document is archival in nature and is intended for those who wish to consult archival documents made available from the collection of Agriculture and Agri-Food Canada.

Some of these documents are available in only one official language. Translation, to be provided by Agriculture and Agri-Food Canada, is available upon request.

Le présent document a une valeur archivistique et fait partie des documents d'archives rendus disponibles par Agriculture et Agroalimentaire Canada à ceux qui souhaitent consulter ces documents issus de sa collection.

Certains de ces documents ne sont disponibles que dans une langue officielle. Agriculture et Agroalimentaire Canada fournira une traduction sur demande.

Canada

DOMINION OF CANADA
DEPARTMENT OF AGRICULTURE
DOMINION EXPERIMENTAL FARMS

Dominion Experimental Farm

Indian Head, Sask.

RESULTS OF EXPERIMENTS

1931 - 1936 INCLUSIVE

W. H. GIBSON
Superintendent

Published by authority of the Hon. JAMES G. GARDINER, Minister of Agriculture.
Ottawa, 1937

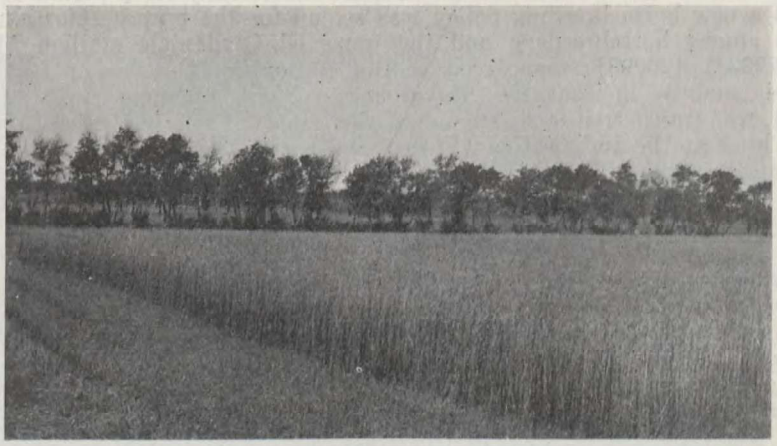
TABLE OF CONTENTS

REPORT OF THE DOMINION EXPERIMENTAL FARM, INDIAN HEAD, SASK., 1931 TO 1936

SEASONAL NOTES

Weather conditions during the crop years 1931-36 have been very discouraging to the farmers of eastern and parts of southern Saskatchewan. The summer of 1931 was very dry having the lowest precipitation record in the history of the Indian Head Experimental Farm, namely, 9·15 inches. The lack of moisture coupled with high winds caused a great deal of soil drifting. This was followed by cutworms, resulting in a partial crop failure and a general feed shortage which necessitated the shipment of live stock to northern Saskatchewan pastures.

Conditions improved in 1932-33-34 due to timely rains with a fair average yield of wheat and coarse grains in most sections. The early rains assured feed in most districts, but during 1933-34 the grasshoppers caused serious damage to grain and feed crops in many sections of southern Saskatchewan. Moisture



Marquis Wheat at Indian Head.

conditions were greatly improved in 1935 there being 11·13 inches for May, June and July. Ample rainfall at this time insured good hay and pasture crops, as well as good stands of grass and clover. Towards the end of June very humid conditions combined with very hot weather produced ideal conditions for rust development, which appeared ten days earlier than usual. The rust spores spread very rapidly and gradually developed into an epidemic which caused serious damage to wheat crops and heavy financial loss to farmers throughout southern Saskatchewan.

The previous five years had gone to nearly all extremes but the winter of 1935-36 was one of the coldest on record. In the summer of 1936 weather conditions were quite arid with correspondingly high temperatures. On the lighter soils throughout southern Saskatchewan crops were a complete failure, feed scarce, and thousands of cattle from these areas were shipped to the various abattoirs for slaughter.

Altogether the past six years have been extremely discouraging ones, especially in southern Saskatchewan where drought, soil drifting, cutworms, grasshoppers, rust and a general feed shortage have caused serious financial loss to farmers, and greatly added to Dominion and provincial expenditures.

ANIMAL HUSBANDRY

Horses

Clydesdale horses are maintained on the experimental farm for work and breeding purposes. Geldings are used for general farm work with yeld mares supplying seasonal power. Feed costs for geldings and yeld mares are appreciably higher due to the necessity of continued stable feeding, whereas brood mares and young stock have access to pasture during the summer months which tends to reduce maintenance costs. Covering a period of six years (1931-36) the average costs of maintaining horses were as follows:—

Stallions	$ 68 85
Geldings	75 34
Yeld mares	67 50
Brood mares	43 10
Two-year-olds	40 36
Yearlings	33 32

Pasture shortage and supplementary feeding greatly increased feed costs the past few years.

Horse breeding has been carried on quite successfully for a period of years. In 1935 a new horse breeding policy was set up for the purpose of stimulating interest among horsebreeders, and the imported Clydesdale stallion Muirton Tide (22324) [26993] was placed at the station for the use of Clydesdale breeders, mainly in southern Saskatchewan. The previous sire, Radiance [25908], was transferred to the Agassiz Experimental Farm in British Columbia. Horses bred at the Indian Head Farm have been successful in winning many prizes at the Royal Winter Fair, Toronto, and provincial exhibitions. These include championships and group prizes in the get of sire and progeny classes.

Shorthorn Cattle

Owing to the pressure of economic conditions and the necessity for reducing expenses, the entire Shorthorn herd, which was rich in Browndale blood and included a number of outstanding individuals, was transferred to the Dominion Experimental Station, Lacombe, Alberta, in June, 1932.

The removal of this herd was a distinct loss to the district and to Shorthorn breeders throughout the province of Manitoba.

Ayrshire Cattle

The herd of Ayrshire cattle was established in 1925 with six cows and a stock bull selected from well known herds in Quebec. Subsequent growth of the herd with the exception of herd bulls, was by natural increase only, but owing to a large proportion of calves dropped during the first two or three years being heifers, the herd had reached a total of about thirty females by 1931, and has since been maintained at approximately the same number.

Type as well as milk and butterfat records of the herd has been steadily improved by the use of carefully selected bulls in conjunction with the culling of off-type individuals and unsatisfactory milk and butterfat producers.

At the present time the herd possesses good type, high average milk production and a remarkably high average butterfat test. All cows in milk are entered in the official Record of Performance. During the years 1931 to 1936 inclusive, sixty-two lactation periods were completed with an average of 8,393·18 pounds of milk and 379·14 pounds butterfat per lactation, the average butterfat test being 4·51 per cent. Average feed cost per 100 pounds milk and per pound butterfat for this period was 47·5 cents and 10·5 cents respectively.

Among herd bulls used during recent years, Burnside Pat Ryan —94587— and Burnside High Degree —137545— were outstanding from the standpoint of type and production of heifers sired. Twelve of a total of thirteen heifers sired by Burnside Pat Ryan that completed one or more lactations, qualified in

R.O.P., several with outstanding records. Of the same number sired by Burnside High Degree and retained in the herd, four have qualified to date and six others now in milk for the first time, give promise of qualifying in R.O.P.

Experimental Feeding Work with Cattle, 1931-1936

A number of feeding experiments with cattle were conducted during the past six years. These are briefly summarized as follows.

Comparison of Barley and Wild Oat Groats for Calves

A feeding test with Shorthorn calves in 1931 comparing the merits of barley and wild oat groats as basic grain feeds for the production of baby beef, favoured barley for this purpose. Gains made by the barley-fed calves were more rapid and cost $6.77 per hundred pounds gain as compared with $8.68 for those receiving wild oat groats, with barley priced at 75 cents and wild oat groats at 85 cents per hundred pounds. The wild oat groats, however, produced superior carcass quality, the fat being whiter and the meat finer and firmer than in the barley-fed lot.

Field Day at Indian Head.

Grain Feeds for Dairy Cows

Tests comparing oats, wheat and barley as principal grain feeds for dairy cows indicated that all these grains when properly supplemented were about equal for milk and butterfat production. Returns, based on butterfat produced, were slightly lower for wheat than for barley and oats which were equal, the value of meal mixtures being calculated at the same price per pound. Heavy feeding of barley to cows or other breeding stock should be avoided however, as it is known to have a detrimental effect on breeding results.

Cut Versus Uncut Sweet Clover

An experiment comparing the economy of cut and uncut sweet clover hay for dairy cows demonstrated that on the basis of butterfat produced at current prices, cut sweet clover was worth approximately $3 more per ton than uncut sweet clover. The difference in favour of cut sweet clover more than paid cost of cutting.

Comparison of Tankage and Ground Linseed Oilcake

Digester tankage was compared with ground linseed oilcake as a protein supplement for dairy cows. Cows receiving tankage produced slightly more milk and butterfat, the cost of butterfat being about one-half cent per pound less than for the linseed oilcake group. Oilcake was valued at $1.95 and tankage at $1.50 per hundred pounds.

Protein Supplement Experiment with Dairy Heifers

Two groups of yearling and two-year-old Ayrshire heifers receiving tankage and ground linseed oilcake respectively, as protein supplements, made lower and more expensive gains than a third group receiving the same basic rations but no extra protein supplement. Results of this experiment indicate that further protein supplements are unnecessary in the feeding of yearling or two-year-old heifers when a ration similar to that fed during the experiment is supplied. This averaged 5·8 pounds meal (2 parts oats, 1 part bran by weight), 8 pounds oat straw, and 36 pounds of corn ensilage per head per day.

Minerals for Dairy Heifers

When a ration similar to the above was supplied dairy heifers, the addition of one-half pound per head per day of a mineral supplement sold under the trade name of Min-O-Vite failed to produce gains in live weight equal to a similar group of heifers receiving no mineral supplement. As the mineral mixture was valued at $9.25 per hundred pounds, cost of gains for heifers receiving this supplement was considerably higher than for the heifers receiving no mineral supplement.

Pasture Experiments with Cattle

A number of pasture experiments were conducted with cattle using cereals alone and in combination.

Oats were seeded alone at the rate of two bushels per acre during early and mid-May, and with fall rye at one and a half bushels of each in mid-June. Field peas were also combined with oats in one seeding but were found unsuitable for pasture purposes.

Cattle were turned into pasture lots when growth reached six to nine inches and pastures were rotated during the season as far as possible to prevent crops from being reduced to less than three inches. Following periods of overgrazing, i.e., when growth had been reduced to less than three inches, the rate of growth or comeback, of crops was much slower, even under favourable weather and moisture conditions, than when less closely grazed.

Oats seeded alone on May 5 gave the greatest number of cow-hours of pasture per acre, followed closely by oats and fall rye seeded together in mid-June. The fall rye in this combination supplied grazing later in the fall than oats alone and also provided spring pasture the following year before spring seeded crops were ready, after which a fair yield of rye grain was threshed in the 1934-35 test. Oats seeded alone in mid-May gave the least cow-hours of pasture.

Average cow-hours of pasture per acre for the three crops were: oats seeded alone May 5, 909·2; oats and fall rye seeded June 14, 850·3; oats seeded alone May 18, 674·6.

Comparative Palatability of Different Pasture Crops for Cattle

In this experiment cattle were given free choice of different pasture crops during two successive years. The first season when good stands and growths were secured on all blocks, a mixture of western rye, brome, crested wheat and alfalfa was first in favour, brome a close second, western rye a rather poor third choice, while crested wheat remained almost untouched until other pastures were

practically bare or had dried up during early fall. Leaves and stems of crested wheat retained their green colour after the heads had matured and then appeared more palatable than matured plants of western rye and brome.

Owing to unfavourable conditions for growth during the second season and a consequent shortage of pasture, grazing preferences were not as marked as for the previous year. The general order of preference remained the same however, but the less favoured crops were readily eaten and all plots were reduced to an overgrazed condition by late summer.

Swine

A herd of Yorkshire swine is maintained for breeding and experimental feeding purposes. The ancestry of every female in the herd traces directly to the sow Indian Head Y-62 —110306— and the boar Romeo —124504— both of which were outstanding individuals of the breed.

Winter Short Course at Indian Head.

New blood is periodically introduced by the purchase of selected boars from leading Canadian breeders. Of herd sires used during recent years Duke 1 K —159917— was outstanding from the standpoint of type and early maturity of litters sired. Slaughter test groups from each of four litters sired by this boar qualified their dams, also the sire, in Advanced Registry. During the past six years a total of ten females have qualified for Advanced Registry.

Female breeding stock is selected largely from dams qualified under Advanced Registry with the object of developing prolific, early maturing strains, possessing good bacon type and a low feed requirement per hundred pounds gain.

A considerable number of selected females and boars are sold each year at reasonable prices to breeders in the district and throughout the province.

Mature sows were bred to produce two litters yearly. During the years 1931 to 1936 inclusive 74 spring litters averaged 11·22 pigs farrowed and 7·66 pigs weaned, while 36 fall litters averaged 11 farrowed and 7·69 weaned. Of all pigs born during this period 68·84 per cent reached weaning age. The average feed cost per pig from farrowing to weaning was 76 cents.

Advanced Registry Slaughter Tests

During the six-year period 1931 to 1936, twenty-one lots of five pigs, or a total of 105 pigs, were fed and finished for the Advanced Registry slaughter test. These pigs were confined largely to dry lots with limited exercise and were fed balanced meal rations supplemented with skim-milk, home-mixed minerals, and cut green feed in season. For all lots fed during this period the following data were obtained: average daily gain per pig 1·23 pounds; average meal required per 100 pounds gain 386 pounds; average net returns per pig at current feed and pig prices $4.39; and average age, birth to finish, 201·7 days.

Comparison of Wild Oat Groats with Standard Grains for Growing and Finishing Pigs

In this experiment wild oat groats and standard grain feeds, supplemented in all cases with 5 per cent of tankage, were compared for the growing and finishing of market pigs. Pigs receiving the groats made considerably higher daily gains with a lower feed requirement per hundred pounds gain and also graded a higher percentage of "Selects" than the other lots. Owing to the comparatively high price of wild oat groats, however, pigs receiving this feed made the lowest net profit.

Comparison of Barley, Wheat, Oats and Rye for Pig Feeding

Barley, oats and wheat chop, supplemented with 8 per cent of tankage, were each supplied as the sole grain feed to pigs over a two-month period. Barley produced an average daily gain of 1·40 pounds, oats 1·27 pounds and wheat 1·23 pounds per pig per day. Feed required in pounds per hundred pounds gain were: barley, 422, oats, 401, wheat, 354. These gains and feed requirements per hundred pounds gain were considered quite satisfactory.

Barley, oats, wheat and rye grain fed alone with a small amount of skim-milk over a longer period gave greatly reduced daily gains and a much higher feed requirement. All lots became unthrifty and developed a scurfy skin condition which was especially noticeable in the wheat-fed pigs. At the close of this experiment, average daily gains in pounds made by the four groups were: barley, ·95, oats ·81, rye ·66, wheat ·55. Feed requirements per hundred pounds gain were much higher than for pigs fed the same grains supplemented with tankage throughout the feeding period, these being as follows: barley 586, oats 757, rye 652 and wheat 758 pounds.

Inside versus Outside Feeding of Fall Pigs

Gains made by fall pigs housed in small straw-banked cabins were slightly higher and more economical than those of pigs fed in the farm piggery—the same feeds and methods of feeding being used. Average daily gains of pigs fed outside were ·90 pounds compared to ·87 pounds for pigs fed inside. Pigs fed outside consumed 569 pounds of feed and pigs fed inside 625 pounds per hundred pounds gain.

Annual Pasture Crops for Swine

Of the various annual pasture crops tested at this farm, alone and in various combinations, oats and fall rye seeded in the spring at the rate of about two bushels of oats and one of fall rye, have proved the most satisfactory for swine. If not too heavily grazed oats in the mixture provide an abundance of palatable succulent pasture until midsummer, after which the fall rye continues to furnish green feed until freeze-up. Other cereals as wheat or barley, may be substituted for oats if necessary but bearded varieties should be avoided. If fall rye cannot be obtained, rape may be substituted for it at the rate of three to six pounds per acre but this crop lacks the palatability of rye and is not as readily eaten by pigs.

CEREALS

Spring Wheat

On fallow land over the five-year period 1932-1936, Reliance exceeded Marquis in yield by 3·2 bushels to the acre and was about one day later in maturing, Ceres yielded ·4 bushels more and matured one to three days earlier, while Reward was only ·4 bushels behind Marquis in yield and matured from three to eight days earlier. Under the severe stem rust conditions of 1935 Marquis yielded 16·3 bushels of wheat weighing 50 pounds to the measured bushel, Ceres 20·8 bushels of 52 pound wheat, Reward 27·1 bushels of 61 pound wheat and Reliance 10·7 bushels of 44·5 pound wheat. The performance of Reward was outstanding, but it is not a rust resistant wheat. Reliance, on the other hand suffered severely.

On stubble land over the five-year period, Ceres was the highest yielder, exceeding Marquis by two bushels to the acre, Reliance by ·7 and Reward by 2·6. In 1935 the quality of the wheats grown on stubble was superior to those grown on fallow.

Of the durum wheats on fallow, Pelissier exceeded Mindum, the standard, by two bushels and Golden Ball by one bushel. Golden Ball is inferior to the other two varieties in quality and at the best is eligible to grade not higher than 2 C.W. Amber Durum. On stubble these varieties were practically equal in yield but Mindum matured one to five days ahead of either Pelissier or Golden Ball.

Winter Wheat

Although hardy varieties and strains of winter wheat are regularly under test a satisfactory sort for our conditions has not yet been secured.

Oats

On fallow land Banner, Legacy and Gopher were about equal in yield, but Gopher is about a week earlier in maturing than Banner and several days earlier than Legacy. While Gopher is a short-strawed sort, it appears to be the best of the early varieties for this district. Victory, a variety of similar maturity to Banner, but a shorter, plumper, more attractive looking oat for market purposes yielded about 2·4 bushels less. Anthony is a variety which is somewhat similar to Banner both in yield and quality, but has in addition a good deal of resistance to stem rust. It is, however, rather susceptible to the smuts. On stubble Victory exceeded Banner by two bushels to the acre, Gopher by 1·7, Legacy by 3·5 and Anthony by 2·1.

Barley

The highest yielding variety on both fallow and stubble land at this farm is Trebi, followed by Regal and Hannchen which are about equal. These varieties are well ahead of O.A.C. 21 which is preferred for malting purposes by the Canadian malting trade. Trebi is rather short in the straw although this is of good strength. Regal is a smooth awned variety while Hannchen is two-rowed. Colsess, a hooded or awnless sort tends to out-yield O.A.C. 21 and is if somewhat earlier maturity. It produces rather a rough, poor looking sample of threshed grain but it is an excellent variety for hay purposes. Olli, a comparatively new variety, is a very early maturing, six-rowed, rough awned sort that shows some promise. It requires further testing, however, to establish its merits.

Fall Rye

Six varieties of fall rye have been tested during the past five years, and of these Dakold, Advance and Common are the only one with sufficient winter-hardiness to withstand our conditions. Crown, Petkus, and particularly Star, all tend to suffer some winter injury with a consequent reduction in yield. Otherwise, with the exception of Star, all of these are good yielding varieties.

Flax

At this farm the flax tests are conducted on summer-fallow land. Wilt has not been a factor but nevertheless a number of wilt resistant varieties are included in the test. Of these, Bison, Buda and Linota have been about equal in yield. The non-wilt resistant varieties, Novelty and Premost have excelled these by about two bushels to the acre, and Crown, a variety very similar to Novelty in most of its characters, by only a little less. Redwing, a new, early maturing, wilt resistant variety, although not yet sufficiently tested, appears to be very promising.

Field Peas

From the standpoint of yield, Mackay heads the list. It is vigorous in growth with a good length of vine, but is somewhat late in maturing. Early Blue, a much earlier maturing variety, although below Mackay in average yield, has much to recommend it. Its main drawback is its shortness of vine, especially under dry conditions. O.A.C. 181, Arthur and Chancellor have all given a good performance.

Field Beans

Norwegian, a very early maturing brown bean has proven a very good yielding variety and one that is almost always certain to ripen in this area. Hunter and Early Wonder have also yielded well but are much later maturing varieties than Norwegian. Robust and Darling, both excellent yielding sorts when conditions are suitable, appear to be too late for this district.

FIELD HUSBANDRY

Cultural

Project F. 144 entitled "Summer-fallow Treatments" compares two methods of ploughed fallow with two methods of ploughless fallow. The ploughed fallows include the standard fallow, that is, ploughed about the middle of June, and the fallow which is ploughed the previous fall. Cultivation in both cases is given as required. The ploughless fallows are cultivated entirely with the duckfoot cultivator except that one is disked the previous fall, while the other is untreated. The average yields from the four methods for the period under consideration show little difference. It should be noted, however, that where the ploughing has been omitted, cultivation has to be efficient, as such land becomes weedy more quickly than where ploughing is practised.

In Project F. 146 "Stubble Treatments for Wheat," five different methods of preparing the stubble for wheat are under test. These are spring ploughing, fall ploughing, spring disking, and burning the stubble and seeding with and without cultivation. Curiously, burning the stubble in the spring and seeding without cultivation has given slightly larger average yields over the past five years than the other methods in the test, although there is only an average difference of 2·4 bushels to the acre between the highest and the lowest yielding treatments. In 1934, spring cultivation appeared to be a detriment and the spring ploughed treatment was the lowest yielding.

Three methods of breaking brome grass sod are tested under project F. 147, breaking early in spring, removing a hay crop and breaking, and removing a hay crop, breaking and backsetting before freeze-up. Cultivation is given in each case as required. Brome sod is difficult to put into good tilth. Breaking in the spring and fallowing throughout the summer is by far the best of the three methods for this purpose and gives more satisfactory yields of grain.

Project F. 153, "Place in the Rotation to Seed Fall Rye," points to the fallow being the best place to seed fall rye, although in years when rainfall is normal very satisfactory yields are usually obtained when rye is sown into disked wheat or oat stubble.

Project F. 179 "Cultural Methods for Sunflowers," brings out the fact that thinning sunflowers to definite distances apart in the rows does not pay for the labour involved.

In project F. 269, Part 3, an attempt is made to determine the best time to sow wheat for a cover crop. Half a bushel of wheat is sown July 15, August 1, and August 15. Included is a plot without treatment for comparison. The July 15 seeding usually gets well into head before freeze-up while the August 15 seeding is comparatively short and does not appear to be as effective as the earlier seedings in holding the soil under heavy winds. Only three years' results are available but strangely enough the average yields of wheat following the cover crop have exceeded that without by from 1·7 to 3·3 bushels per acre. In 1936, however, under dry conditions the ordinary fallow was 5·4 bushels ahead of the cover crop sown July 15, and 1·7 bushels more than from either of the later seedings. Grasshoppers usually do considerable damage to the cover crop regardless of the date sown.

Harvesting Marquis Wheat at Indian Head.

Commercial fertilizers for wheat are tested under project F. 512, the purpose being to observe the effect of phosphate fertilizers on wheat when drilled in with the seed. Previous tests have shown the futility of broadcasting such fertilizers under our conditions. This test has been in operation three years only but results to date show no apparent benefit by using the fertilizer on stubble land; no benefit on stubble land where fertilizer was used on the previous crop; benefit up to three days earlier maturity and up to five bushels increased yield, varying with the season, when the fertilizer was sown on fallow land. In the dry year of 1931 tests were made on good fallow with wheat, oats, barley and flax. Flax was the only crop that did not respond in some measure to the application of phosphate fertilizer.

Rotations

During 1912 a series of rotations were inaugurated for the purpose of finding the most suitable crop sequence for the territory served by the Experimental Farm. In 1921 these rotations were revised and brought up-to-date in accordance with changes in general agricultural conditions. The three-year rotation known as "C" is a straight grain system embodying fallow, wheat, wheat, which is the common course followed on most wheat farms. Marquis wheat was grown continously until 1929 when Reward was introduced for the purpose of wild oat control. Deferred seeding of Reward wheat and surface cultivation assisted

greatly in the control of wild oats and other weeds. In 1935 normal cultural practices and the seeding of Marquis wheat were resumed. Crop failure in 1931, low yields in 1932-34 combined with rust interference in 1935, seriously reduced the long-time average; however, the six-year average cost per bushel for fallow and stubble wheat is 60 cents and 82 cents respectively, as compared to an average of 59 cents.

In the original set-up, Rotation " P " was designed for mixed farming and carried a variety of crops considered suitable for live stock production. Drought, however, in 1931-32 seriously interfered with grass and alfalfa crops necessitating a complete new set-up. In 1934 the rotation was divided into a five and four-year series. The five-year sequence carries alfalfa for the purpose of providing hay and pasture for live stock. The four-year shift is as follows: fallow, wheat, oats, and sweet clover. Every five years a new block is seeded to alfalfa. The set-up of this rotation is quite encouraging and should meet the immediate requirements of many grain farmers. The second section of Rotation " P " is a three-year sequence: fallow, wheat, wheat with sweet clover to be ploughed under as a green manure when six to eight inches high. Under this system the fertility will be maintained and fibre added to the soil.

Rotation " J " was discontinued in 1933 and the land set out for experimental work with annual pastures for dairy cattle and for seed grain production.

Rotation " R " carries a nine-year sequence and is designed to include a combination of crops suitable for live stock work. Crops included in this rotation are: wheat, oats, corn, hay and pasture. For general conditions in southern Saskatchewan and especially during the period 1931-36, it has not proven satisfactory. Stands of alfalfa and rye grass have been extremely difficult to establish with correspondingly low yields of hay. Corn, which follows alfalfa breaking, has given fairly satisfactory returns. The wheat and oats grown on Rotation " R " are used for seed production.

Soil Drifting Project

In 1932, experimental work in soil drifting control was set up on the Patterson farm to gain information on methods of cultivation that would assist in " pegging down " the soil. The cropping system is on the two-year plan: summer-fallow and wheat. The block is divided into eight units of six acres each. During the fallow year the one-way disk and the duckfoot cultivator are the main implements used in preparing the land for crop. Tillage methods vary in accordance with the project and include such implements as the spike harrow, spring tooth cultivator, duckfoot cultivator and the one-way disk. Seeding is performed with the hoe drill, single and doube disk drills. Packing is carried out where necessary. Comparatively little drifting has been observed during the progress of the experiment. Reward wheat is used in connection with the project. Returns remain fairly uniform and the average yield covering the years in crop 1932-34-36 was 22·3 bushels per acre.

Weed Control Project

This project is mainly designed for the purpose of wild oat eradication. The two-year cropping plan is followed and includes greenfeed oats, fall rye, barley, wheat and deferred seeding of Reward wheat. Evidence to date strongly indicates the value of greenfeed oats and deferred seeding of Reward as the most satisfactory methods of control. Reward may be seeded as late as May 25 with good results and is recommended because it produces a fairly remunerative cash crop. The use of phosphatic fertilizers hastens maturity and increases the yield over a period of years. The average yield over a period of three years on the late seeded block is 22·9 bushels per acre as compared to 18·8 bushels per acre at normal seeding dates.

Cover Crops

Cover crops in the dry areas are used as a substitute for strip farming, and are usually sown about the first week in August to insure sufficient growth before "freeze-up" to hold snow and in a measure prevent winter and early spring drifting. Cereal grains such as wheat, oats or barley may be used quite successfully. The rates of seeding are usually one-half bushel of wheat and three-quarters bushel oats or barley per acre. Winter annuals, such as French weed, are difficult to control and require considerable spring work under the cover crop system.

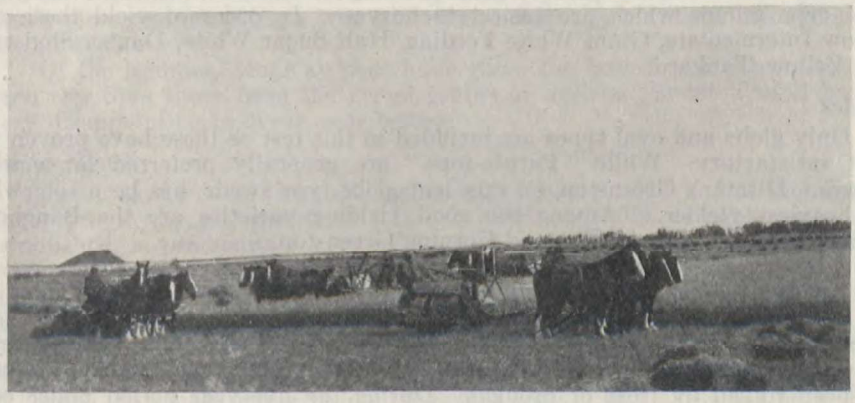
Fertilizer Field Tests

For a period of years fertilizer tests have been carried on under field conditions. Repeated trials indicate that commercial fertilizers such as superphosphate and ammonium phosphate materially encourage germination and maturity, as well as a substantial increase in yield per acre.

FORAGE CROPS

Corn for Ensilage

Ensilage corn has averaged, over the past five years, from six and a quarter to eight and a quarter tons to the acre. In no instance has it exceeded ten tons. As a rule, the quality or feeding value of the silage, or fodder if such is preferred,



Harvesting Banner Oats at Indian Head.

increases with the maturity of the crop, or briefly, the riper the corn, the better the silage. It is important, therefore, when growing corn to select a variety which will not only give the largest tonnage to the acre, but also will reach the greatest maturity possible in the area where it is grown. Northwestern Dent, an old established variety of considerable merit, has proved the largest yielder at Indian Head, closely followed by Falconer and Minnesota No. 13. Without doubt, these are the most suitable varieties for ensilage in this area. Quebec No. 28, a good yielding flint variety has produced somewhat less than any of these. Golden Glen and Longfellow, two varieties which have proven very useful in Ontario, have been tested over a shorter period and during that time have somewhat outyielded Quebec No. 28. These varieties, however, are comparatively late in maturing and it does not appear likely that they will prove suitable for Western conditions.

Sunflowers

Four varieties have been tested, namely, Mammoth Russian, Manchurian, Ottawa Selection No. 76, and Mennonite. Mammoth Russian is the latest

maturing variety of the four, but it is also the heaviest yielding, and on this account, since it makes satisfactory silage, is generally preferred. Mennonite is a very early maturing sort producing roughly a little more than half as much as Mammoth Russian. However, it will produce a high percentage of ripe seed and in this characteristic greatly excels Mammoth Russian.

Field Roots

The acreage of field roots grown in Saskatchewan is now much smaller than it was ten or fifteen years ago. No doubt this is due in a measure to the large amount of manual labour involved in their production. Nevertheless, field roots make a useful feed crop not alone for their nutritive value but also for their tonic effect. A small quantity on hand seldom comes amiss. The labour cost can be reduced somewhat by selecting a type of root that in addition to yielding well can be harvested with reasonable ease. By type is meant the general shape of the root; it may be long, half-long, intermediate, tankard, ovoid or globe. Type is of greater importance than varietal name.

Mangels

In regard to mangels our experience has been that long types are much too difficult to harvest. Intermediate and half-longs are much easier and tankards are probably the easiest of the lot. Globes are easy to harvest but they have tht undesirable feature of being easy to dislodge during cultivation. The following varieties have proven good yielding sorts and they fall within the three type groups which are easiest to harvest. In order of yield these are, Yellow Intermediate, Giant White Feeding, Half Sugar White, Danish Sludstrup and Yellow Tankard.

Swedes

Only globe and oval types are included in this test as these have proven the most satisfactory. While "Purple-tops" are generally preferred for market purposes, Ditmar's Green-top, an excellent globe type swede, has been somewhat the heaviest yielder. Among the good yielding varieties are the Bangholm strains, Monarch, Purple Top and Corning Green-top.

Soy Beans

Soy beans have been tested at this farm for ten years past but so far have failed to demonstrate any real value as a dependable farm crop for this area. In some years a reasonable crop of hay has been secured but in others the crop has been ruined by frost or drought. During the five-year period under consideration hay yields have averaged from a ton to a ton and one-quarter to the acre. In that time they have been as low as a third of a ton and as high as two and one-quarter tons. Further, seed production is most uncertain and a good yield of seed is the exception rather than the rule. This is a most important matter as a limited seed supply is almost sure to narrow the usefulness of any crop, particularly an annual no matter what its adaptability and productive power in other ways may be.

It has been stated that soy beans have a soil requirement similar to that of corn and that the early varieties will ripen seed in about the same time as the early flints. In a broad sense, our experience has shown this to be true, but the soy bean appears to be more sensitive to climatic conditions and, at this farm, the earliest available varieties, if they ripen seed at all, will not mature as quickly as the earliest varieties of flint corn. Our tests now include only Manitoba Brown, a very early maturing brown-seeded variety, Wisconsin Black, early but black-seeded, and Mandarin, a medium early yellow-seeded sort that has proved very useful in Ontario. Only once, namely in 1936, have we secured any seed from Mandarin and the quantity was small. Manitoba Brown is more likely to mature seed than Wisconsin Black but Wisconsin Black is without

doubt a better sort for hay purposes. For the time being, any attempt to grow soy beans in this area should be confined to small acreages and to the Manitoba Brown or Wisconsin Black varieties.

Annual Hays

Of the cereal grain crops, oats, wheat, barley and even rye make very good hay when properly handled. Oats, however, is the best of the lot not only in quality but in quantity produced. Banner oats and Colsess barley, a beardless variety, sown together, have proved an excellent yielding combination crop. Banner oats and MacKay peas sown at the rate of two bushels of oats to one of peas make the best combination crop of this kind. Chancellor peas, an earlier maturing variety than MacKay, mature much too qickly to combine well with Banner oats. It should be recognized, however, that peas is a crop that will almost surely prove disappointing under hot dry conditions and that nearly always the cost of the seed is comparatively high. Peas, therefore, should be included only where conditions are likely to prove favourable.

In addition to the cereal grains the millets have considerable value as late sown hay crops. While they do not, as a rule, equal the yields obtained from oats sown at the normal time, they frequently outyield oats which are sown late. Under dry conditions, however, the millets are likely to prove rather unproductive. At this farm, three different types have been tested, namely, the foxtail, broomcorn and Japanese. Of these the Japanese is altogether too late and the broomcorns do not make as satisfactory hay as the foxtail sorts. The best yielding varieties have been Siberian and Hungarian, both belonging to the foxtail group.

Of the legumes, MacKay peas have given the largest yields but these have been less than those from the cereal grains or millets. Sweet Trefoil has been very disappointing in every year tested.

Sweet Clover

Sweet clover is a biennial legume which has proved a fine yielding crop under practically all conditions. It has been especially valuable, once it was established, in producing a very substantial growth when perennial grasses and even alfalfa have suffered severely from drought. From a hay and pasture standpoint many a farmer has reason to be thankful for including sweet clover among his farm crops.

Of the varieties in the test the I.H.C. selection of yellow blossom sweet clover, or as it is now named, Erector, has been coarser, taller and more erect in habit of growth than most of the yellow blossomed sorts. In yield it has been slightly the most productive over the past four years. This is closely followed by Common Yellow Blossom and Common White Blossom. In Saskatchewan, Arctic, a white-blossomed sort, is regarded as the standard variety on account of its winter-hardiness, early maturity, fine quality and yielding ability. Much more attractive than Arctic in general appearance is Alpha, lower and more bushy in growth, very fine in the stem, leafy and equalling or approaching Arctic in yield. It also shows better powers of recovery after cutting than most of the other varieties. It seems altogether likely that Alpha will prove a most useful variety for Saskatchewan conditions.

Alfalfa

Alfalfa, the most valuable perennial plant of the legume group, is particularly suited to Saskatchewan conditions. It is not very productive under dry conditions but it is deep rooted, persistent and long lived and yields abundantly when moisture conditions are favourable. The usefulness of this crop cannot be over-emphasized. However, it is rather particular with regard to its soil requirements and should be sown only on the best of soil and where it can be left down for at least several years.

Grimm, the variety which for years has been recommended for Saskatchewan on account of its hardiness and yielding qualities, has maintained its position among the leading varieties in the test. The seed of Grimm is usually easy to obtain and the cost reasonable. Ontario Variegated is very similar to Grimm in performance and yield but sometimes shows less hardiness under severe conditions. Cossack has nothing to recommend it over Grimm and the seed in the past usually has been more costly. Ladak is a new variety which has been tested at this farm for only a limited period. It is said to be very hardy and drought resistant, but so far Grimm has equalled it in these characters at Indian Head. It is a fine looking alfalfa in the field and shows definite superiority to all other varieties in the test in ability to yield a heavy crop of hay in the first cutting of the season. In the second cutting, however, it is usually inferior and may be surpassed by Grimm or Ontario Variegated in total weight of hay produced. Ladak shows promise where the practice is to cut only one hay crop of alfalfa during the year.

It is interesting to note that for some years past an experiment has been under way at this farm comparing the effect on both hardiness and yield of cutting the alfalfa for hay once in each year instead of twice. It is thought that where two cuttings of hay are taken each year the second crop is sometimes cut so late that winter injury becomes quite pronounced as a result of insufficient top growth being developed before winter sets in. In the test, so far, neither treatment has shown any winter injury and in average yield the one cutting has proved slightly better than the two. There is a little sacrifice in the quality of the hay where only one cutting is taken as the crop is left until it reaches full bloom. However, it is still quite palatable and nutritious at this stage.

Alfalfa and Grass Combinations

Excellent results have been obtained at this farm by combining alfalfa with western rye grass. For hay purposes both of these crops work in well together. They proceed toward maturity at about the same rate and are ready to cut for hay at about the same time. They may be mixed in any proportion desired. An excellent rate of seeding would be five pounds of alfalfa to ten pounds of western rye grass to the acre.

Brome grass also combines well with alfalfa. As it ripens over a more extended period than western rye grass it goes well in combination with alfalfa for hay purposes. It is also a wonderful pasture grass in this area and combining it with alfalfa adds to its value. It may be mixed with alfalfa in proportions similar to those of western rye grass.

Crested wheat grass does not appear to be as well adapted for seeding with alfalfa in a hay mixture. It starts to grow very early in the spring and is usually too mature for hay by the time alfalfa is ready.

Perennial Grasses

This test includes only those grasses which are adapted to Saskatchewan conditions. These are slender wheat grass, or as it is known locally, western rye grass; brome grass; and crested wheat grass. Slender wheat grass, however, while it makes excellent hay does not furnish pasture over nearly as long a period as either brome or crested wheat grass. Considering hay yields only, the averages of these grasses over the period of the test have not differed to any extent although their position changes from year to year. Under the dry conditions of 1936 crested wheat grass was somewhat superior to both brome and western rye grass.

Brome grass usually gives splendid yields of hay for two or three years after it has been laid down but becomes gradually less productive as time goes on. The strongly creeping nature of its root system soon leads to a sod-bound condition. When this stage is reached the best practice is to seed down a

new field and plough up the old one. However, where this is undesirable the old field may be somewhat renewed for a short period by disking or shallow ploughing in the spring when moisture conditions are likely to be good.

Crested wheat grass, while a vigorous long lived grass once it is properly established, tends to look thin and weak in the early stages of its growth. It is difficult to start unless conditions are satisfactory. It requires cool weather, firm ground, and shallow seeding. Early seeding, therefore, is most essential when crested wheat grass is sown in the spring. The advent of hot weather before the crop is properly started is usually very damaging. Tests conducted at Indian Head during the past three years have indicated that fall seeding has, in general, been as successful as early spring seeding and much more so than that done after the warm weather has set in. In the fall, in this area, around the tenth to the fifteenth of September would be a good time to seed.

HORTICULTURE

Fruits

Apples

The crab apple crops of the past few years have been good. The trees have assumed a distinctly biennial habit of bearing, with, fortunately, the light crop year coinciding with the years of scant rainfall. The Saunders first generation hybrids form largely the total crop, and of these Silvia, Eve, Prince,

Sylvia Crabapple

Jewel, Robin, Tony and Pioneer are the most outstanding. Some of the F_2 hybrids have also given some crop; of these Rosilda, Printosh and Toshprince have done the best. These have fruited after extremely cold spells when the mercury dropped to –45° F., proving that the trees are sufficiently hardy to be grown with success on the prairies. As much as five and six tons of fruit have been

harvested in single years, individual trees producing between five and six hundred pounds. The continued extremely low temperatures of the winter of 1936 caused much sunscalding of most varieties, varying in intensity on different sorts.

Large apples have not done well; no named variety appears to be sufficiently hardy to withstand the extremes of temperature. Some selection work has been done, principally with seedlings of hardy Russian named varieties. These have been growing since 1915. The more tender of these have long since killed out and selections have been made from the survivors. One seedling of Moscow Pear apple has been outstanding, fruiting yearly and the fruit is of good quality. This variety has been named Reward and appears to be useful for widespread dissemination on the prairies. Another seedling producing sweet edible crab apples has been named Renown and is being propagated for further testing. Of somewhat similar parentage to Osman this variety should be particularly valuable for northern planting.

Plums

Plum testing has been continued. Thus far the most reliable varieties to plant on the prairies are selections of the Manitoba native plum of which Assiniboine appears to be the most valuable. Winnipeg, Mammoth and Olson are other good varieties. Many plum seedlings have been grown and fruited but none have been superior to those named. Of the plum-sandcherry hybrids under test Opata has borne the largest crops but has shown injury during some winters. This type of bush fruit is valuable in that generally the branches below the snow line survive the winter and produce some fruit. Sandcherries produced abundantly and by selection of seedlings, worthwhile fruits were to be had from some bushes. Sour cherry and Nanking cherry have not been sufficiently hardy.

Small Fruits

Raspberries were severely affected by the drought. Crops were only produced during the years when adequate rainfall was received during July and August. Sunbeam, Ohta and Herbert varieties have proved the hardiest and the heaviest annual croppers. Higher quality varieties, while not so hardy, may be safely overwintered by bending the canes down thus affording some protection. Unless irrigation may be given, the uncertainty of the rainfall makes this extra labour of doubtful value. Spider mites did much damage in dry years.

Red Currants generally did well every year, while black currants were not so good. The currant fruit fly has been found to seriously curtail the yield and is extremely difficult to combat. The imported currant worm was controlled by arsenical sprays. London Market, Holland, Simcoe King and London Red were the heaviest producers of the reds, Saunders, Magnus and Eagle being the best of the blacks. Gooseberries have not been any too satisfactory under existing conditions. The Davidson appears to have some promise for prairie culture. It produces fruit up to an inch and a half long, of a rich golden colour and is reasonably hardy.

Strawberries were grown successfully under irrigation, otherwise they would have been total failures. Narcissa, a recent introduction, appears quite promising, being of high quality and very productive. Gem, a new everbearing variety, showed up well and produced abundantly; the fall crop was particularly large. Senator Dunlap continues to be the standard of excellence.

Vegetables

The vegetables crops have been seriously affected by the vagaries of the weather. Hot weather crops have been retarded by cool seasons and cool crops by hot seasons. All kinds were hampered by scant rainfall. In many kinds of vegetables, old varieties have maintained their positions at the top of the list. In other kinds the efforts of the plant breeders to effect improvements are revealed in higher quality, greater yields or earlier maturity.

Beans.—The bean crops have been severely affected by heat, drought and frost in various years. Of the wax-podded varieties Webber Wax, Davis White Wax, Sure Crop Stringless and Round Pod Kidney Wax, were among the heaviest producers. Of the green-podded varieties, Masterpiece, Bountiful, Interloper Challenge Black Wax and Stringless Green Pod were among the best. Interloper Challenge Black Wax and Princess of Artois are two of the earliest varieties ready for use. Oregon Giant of the pole beans has been outstanding while Early Wonder Wax and Prizewinner have also done well.

Beets.—This type of vegetable has met with few adversities, a fair to good crop having been harvested almost every year. Detroit Dark Red is probably one of the best sorts from year to year, with Crimson Globe and Early Wonder also doing well.

Cabbage.—The drought affected the cabbage crop, as only half a crop was harvested in those years of scant rainfall. The varieties to do well from year to year were, Golden Acre, Copenhagen Market, Succession, Midseason Market, Danish Ballhead, and Glory of Enkhuizen. The results from seed sown where the plants grew showed that early maturing varieties were more dependable than later sorts. Golden Acre, Copenhagen Market and Midseason Market were the best when grown this way. Golden Acre is one of the first to be ready for use.

Cauliflower.—Like the cabbage the heat and drought were limiting factors for satisfactory results, the heads being small or discoloured in unfavourable years. Danish Perfection, Early Dwarf Erfurt, and Early Snowball have been the outstanding varieties year after year. These were also the best when seeded outside. When treated this way, often higher quality crops are harvested as the heads are not subjected to such intense heat and burning.

Carrots.—The carrots in general did well every year and satisfactory crops of roots were harvested. Chantenáy has been the outstanding variety year after year, while Market Garden, Danvers Half Long and Nantes have done well.

Celery.—Artificial irrigation was given to the celery plants which insured excellent crops from year to year. Of the early varieties Golden Plume and Golden Self Blanching have been giving the best crops, while Emperor, Winter Queen and Giant Pascal gave excellent crops of high quality late celery. Soil was used entirely for blanching.

Corn.—Corn generally does better in hot summers when there is sufficient moisture available to maintain growth. The plant breeders have produced several improved varieties, Golden Gem, Banting, Pickaninny and Dorinny being valuable acquisitions. Those named, with Golden Sunshine and Golden Bantam supply a high quality product throughout the season. Where these varieties are planted mature ears may be enjoyed seventy days after planting and continued until killing frosts cut down the crop.

Cucumbers.—Because of delayed germination and early frost the cucumber crop was reduced in some seasons. Generally fairly good crops were harvested. Early Russian, Improved Long Green and Prolific have been consistently the heaviest cropper, and Snow's Pickling and Davis Perfect have done well.

Lettuce.—Climatic conditions have not been favourable for this class of vegetable. The plants have been too prone to bolt to seed rather than to form heads. Crisp-as-ice, a small type of head lettuce, has been consistently good, while Salamander, New York No. 12, California Cream Butter and Iceberg have also done well and given larger heads. Grand Rapids has been the best leaf lettuce under test.

Muskmelon.—This type of vegetable does not enjoy the popularity which it should. Generally the seasons have not been long enough for the higher quality varieties to mature in greater quantity. Selections of the Early Russian, which are early maturing but lacking in quality generally produced a good crop. This type was crossed with the higher quality later sorts, the resulting hybrids being of excellent quality and ten days to two weeks earlier than Golden Champlain, the best of the named sorts. Extra Early Knight was another named variety that matured fruits in some seasons. Two strains of the hybrids appear particularly promising and will be released for distribution as soon as the type is fixed. These are being named Farnorth and Katepwe for purposes of identification.

Onions.—Complete failure of the onion crop occurred in two years, and conditions have not been of the best for this important vegetable. Delayed germination and drought have been the chief contributing factors of low yields. However, Giant Yellow Prizetaker, Ailsa Craig and Large Red Wethersfield, have done well, and Sweet Spanish when started inside will produce a good crop. White Baretta pickling is the best of that type.

Parsnips.—Parsnips have not been an outstanding heavy crop, but fair yields have been obtained from Hollow Crown, Guernsey, Manitoba Prize Intermediate, and Dobbies Selected of many varieties under test. It is difficult to get early and even germination every year.

Peas.—The peas have generally produced a crop from year to year. Alaska has been the first ready for use and is better suited for canning but lacks in quality. Thos. Laxton is almost as early and of excellent quality. Lincoln is the outstanding pea for this locality. It is the heaviest yielder from year to year. Laxton Progress × Earliest of All is a comparatively new hybrid and is next to Lincoln in point of yield and a few days earlier maturing. Director, Invermere, Stratagem, and Holloman are other good varieties that can be counted on to do well.

Potatoes.—The potato crops have varied with the rainfall, and in some years almost total failures have resulted. Generally new varieties or sorts little grown have been the heaviest yielders; some of these should be more widely grown as they are superior to most of the older sorts. Gold Nugget has done well and is a smoother sort than Irish Cobbler and similar to this valuable old timer in point of quality. The Cobbler though rough is still one of our leading varieties. Chippewa is a beautiful white smooth sort recently introduced but lacks somewhat when cooked, being soggy. B. C. 32 has been the best yielder in the two extremely dry years and appears to have merit on this account but is not overly dry or mealy. Columbia Russet is a vigorous grower and heavy yielder but requires a long season to attain full maturity. Warba is a recent introduction, sets its tubers early and may be valuable on that account. White Bliss in appearance is similar to Warba and is valuable for those who do not like a floury potato. Bliss Triumph is similar except in colour.

Peppers.—The pepper crop has been good. Harris Earliest, has been the best yielder from year to year, closely followed by Early Giant which has done consistently well. Golden Queen and Monstrous have also given some ripe fruit. Two selections of this station are considerably earlier and, while not large fruits, are valuable.

Pumpkin.—Frost injury frequently cut down the vine crops before the total crop of fruits produced had matured. The trend in pumpkin culture is away from the extremely large coarse sorts. Sugar is outstanding, of excellent quality and very productive. Pie and Winter Luxury have also done well.

Radish.—The early radishes generally do well. White Icicle seems to withstand unfavourable conditions the best. XXX Scarlet Oval, Coopers Sparkler, French Breakfast and Twenty Day Forcing are other good sorts.

Rhubarb.—Both Ruby and MacDonald do very well and are high in quality. Seedlings of Ruby have been selected which are of good quality and productive.

Spinach.—The Bloomsdale Long Standing variety has given the best results, closely followed by King of Denmark and Giant Leaved Nobel. New Zealand continues to crop throughout the season.

Squash.—Like the pumpkin, the squash suffered from frost. The Hubbard types have done best. Buttercup has done well. Early White Bush is to be recommended of its type.

Turnips.—Red Top White Globe is the heaviest yielder of summer turnips, followed by Early Snowball and Extra Early Milan. Canadian Gem and Perfection are two useful swede turnips.

Tomatoes.—Early ripening is a very desirable and necessary factor in so far as tomato production is concerned. In this regard Abel is the leader, making it very useful. Bestal, Herald and Alacrity are all valuable. These are recent introductions from the Central Experimental Farm, Ottawa. Beside these Beauty of Lorraine, Earliest of All, Norfolk, Burbank and Langportonian have given excellent crops. Bison does well; it is of the determinate habit of growth and cannot be pruned.

Watermelons.—This kind of vegetable has only produced one satisfactory crop in six years. Earlier maturing varieties are being produced, however, which may make it possible to grow these successfully. Northern Sweet and Willis Sugar did well. Pride of the Yukon, Kleckleys Sweet and Early Canada were fair.

Cultural Projects

Variations in cultural methods have been continued to ascertain what practices are most desirable. It has been found that beans when planted in rows rather than in hills give increased yields. Roots that have been allowed to become fully mature will keep in storage for greater time with less spoilage than immature ones. By sowing seed of Banting corn at ten-day intervals after it is first possible to plant, it is possible to have a continuous crop of corn until freeze-up. It is not advisable to plant after July 1. Celery plants may be set out until the middle of June with assurance that a satisfactory crop may be harvested. Early planting gives mature plants and it has been found that the more mature the plants are the better they will keep in storage. The earlier the lettuce crop is planted the greater will be the crop of marketable heads. Very poor crops result from plantings made after the middle of May. Results show that potatoes generally do better and give greater crops if planted about the second week in May.

Floriculture

Annuals.—The seasons have not been at all favourable for annual flowers. It has been necessary to resort to irrigation frequently. Without irrigation very poor germination of the seeds of hardy annuals would have been experienced. These are tested extensively and are very useful.

The hardy annuals that have done well are alyssum, ammobium, anchusa, asperula azurea, bartonia, calendula, cacalia, candytuft, campanula, centaurea, clarkia, coreopsis, cosmos, cynoglossum, dianthus, dimorphotecha, aurantiaca, didiscus coeruleus, eschcholtzia, gaillardia, godetia, gilia capitata, gypsophila, hawkweed, larkspur, lavatera, leptosyne stillmania, linaria, linum rubrum, lupinus, mathiola, mignonette, mirabilis jalapa, nasturtium, nemophila insignis, nigella var Miss Jekyll, phacelia, portulaca, poppy, saponaria, scabiosa, sweet pea, sweet sultan, virginian stock, whitlania gloxinoides.

The half-hardy annuals, started in the greenhouse and planted out, gave a good display, they include, antirrhinum, ageratum, arctotis grandis, balsam, celosia, calliopsis, chrysanthemum, delphinium, dahlia, var. Coltness Gem, linaria, lobelia, marigold, matricaria, nimulus, nemesia, nicotiana, pansy, pentstemon, petunia, phlox drummondi, rudbeckia, salvia, salpiglossis, statice sinuata, stocks, verbena, zinnia.

Herbaceous Perennials.—The herbaceous perennials can be depended on to make a fair to good showing every year. The period of bloom varies with each variety and is spread over the whole season. Those that have done well are achillea, aconitum, althaea rosea, anthemis, aquilegia, arabis, astilbe, asters, aubretia, bocconia, campanula, celphalaria, cerastium, clematis, delphinium, dianthus, dicentra, dictamnus, echinops, ritro, eremurus, eryngium, gaillardia, geranium, gypsophila, helianthus, helenium, hemerocallis, heuchera, iberis, iris, lavatera thuringiaca, lilium, linaria, lychnis, lythrum, monarda, myosotis, papaver, peony, primula, pentstemon, phlox, polemonium, pyrethrum, rudbeckia, saponaria, saxifrage, scabiosa, sedum, sidalcea, solidago, statice, thymus, thalictrum, trollius, verbascum, veronica, viola.

Spring Flowering Bulbs.—This type of plants ushers in the spring, being soon in bloom after the snow melts and making much appreciated splashes of colour. Scilla siberica, blue and white, and Crocus vars Cloth of Gold and Purpureum grandiflorum are the first to bloom followed by Narcissus - Van Sion, Sir Watkin, Victoria, King Alfred and Emperor. Tulips are also valuable, first the early single and double types to be later followed by the Darwins, of which Prince of Wales, Mary Gretchen, City of Haarlem, Madame Krelage, Farncombe Sanders, Clara Butt, and Wm. Pitt are some of the good ones.

Iris.—Besides the species of iris that do well, excellent results are to be had by growing the tall bearded iris. They suffered considerably during the extremely cold winter of 1936. Those that survived and made a fair showing Dr. Bernice, Navajo, Othello, Japanesque, Mithras, B. V. Morrison, Sweet were, Mrs. Sherwin Wright, Willie Barr, Maori King, Hesperia, Madame Cherean, Lavender and Rose Unique.

Peony.—The peony has always done well and is one of the most desirable kinds to grow. It is hardy, is not exacting as to soil conditions, may be left in the one location for years and have few diseases or pests to affect them. They start to bloom about mid-June and carry a riot of colour on into the third week of July. Those varieties that gave pleasing displays are Reine Hortense, Marguerite Gerard, Alexandria, La Perle, Sarah Bernhardt, Edouard Andre, Jeanne d'Arc, Madame Crousse, Duc de Wellington, Claire Dubois, Madame Geissler, M. Krelage, Felix Crousse, Festiva Maxima, Jas. Kelway, Albert Crousse, Madame Gaudichau, King Albert, Le Cygne, Tourangelle and Livingstone.

Lilies.—Lilies have given pleasing displays and by planting different species and varieties a continuous showing of flowers may be enjoyed from mid-June until mid-September. L. monadelphum is usually the first to come into bloom with other varieties as follows: tenuifolium, phildauricum, philada, dauricum,

philadelphicum, thunbergianum. Hansoni, martagon, amabile, Willmottiae, cernuum, regale, Maxwell, Davidii, davmottiae, leichtlinii, tigrinum, callosum, Henryi, Wallacei.

Dahlias.—The large flowered dahlias have not done particularly well. The extremely hot weather burned the petals before the flowers became full blown. The most satisfactory showing is made in the fall with the cooler days, and at that time the frost hazard is generally present. Excellent results have been secured from the newer type bedding dahlias. These have been treated as half-hardy annuals and the wealth of bloom was entirely pleasing.

Roses.—The roses under test are chiefly of the hardiest varieties. Rosa rugosa hybrids forming the greater part of them, and of this type Hansa, Agnes, Rosarie de l'Hay, Belle Poitvine, and Madame Geo. Bruant have done the best. Rosa spinosissima altaica is probably the outstanding rose tested. It is particularly valuable in that it shows very little killing, comes into bloom early with a profusion of creamy yellow flowers followed later by dark red coloured hips. Betty Bland is quite hardy and does well generally. A great deal of injury is caused by the rose curculia, a reddish black snout beetle. Some

Superintendent's Residence, Winter Scene

varieties of polyanthus roses are being grown but kill back to the ground every year. Breeding work has been done, crossing the Ross rose with hardy rugosa varieties, and several seedlings are showing merits for prairie culture.

Trees and Shrubs.—The arboretum specimens have been severely hit with the drought and the heat. Most of the large poplars have had to be removed because of killing. Caragana, of which many species are under test, has thrived. This class of shrub seems particularly suited for prairie culture as they are winter hardy and tolerate the arid atmosphere. Birch and Manitoba Maple showed much injury, many being removed. Halimodendron argenteum is a dry land shrub and does well from year to year. Honey-suckles and lilacs are good doers and valuable. Spiræas have shown much winter injury, pekawienses, flexuosa, sorbifolia and media sericea showing the least damage. Elm and ash continue to thrive and appear to be among our most valuable shade trees. White spruce, blue spruce, Scotch pine and balsam fir are the best of the conifers.

Many shrubs are being tested as to their suitability for hedges. Caragana arborescens is the most widely grown and admirably adapted for this purpose. Caragana pygmaea is a dwarf growing shrub and fits in nicely where a neat low hedge is required. Common lilac does well, maintaining its dark green leaves well into the fall. Cotoneaster acultifolia makes a pleasing hedge with its shiny leaves and black berries.

POULTRY

The nucleus of the present Barred Plymouth Rock flock was obtained in 1931 when 178 pedigreed pullets were received from the Central Experimental Farm, Ottawa, and the Experimental Stations at Rosthern and Scott, Saskatchewan.

Breeding work was started in 1933, selection of breeding stock being based on trap-nest and egg-weight records, as well as general type, colour and body weight, with the object of developing high production, large-egg strains, possessing desirable type and colour. Only females two years of age and over are now used for breeding.

During the past four years an average of over 700 pedigreed chicks per year were hatched, mostly in 250-egg-capacity Buckeye incubators. Absolute cleanliness and frequent disinfection of buildings and equipment, together with annual rotation of range ground, have been found effective in the control of common parasites and diseases.

The entire flock has been tested annually for pullorum disease since 1931 and all reactors removed. In 1936 out of over 800 birds tested no reactors were found.

A considerable number of pedigreed cockerels have been sold each year to breeders in Saskatchewan and Manitoba.

One or more pens of pullets entered in the Saskatchewan Egg Laying Contest since 1933 have resulted in a number of birds qualifying for registration each year.

In the fall of 1936, sixty-seven pullets were entered in official R.O.P. and it is hoped this entry will make a creditable showing.

The *Saskatchewan Egg Laying Contest.*—Although the depression years forced many poultrymen to discontinue registration work, a considerable number valiantly carried on and it is to be hoped they will be richly rewarded for their courage and the faith they have shown in the future of poultry registration.

Entries in the Saskatchewan Egg Laying Contest for the past six-year period totalled 119 pens or an average of about 19 pens per year, mostly from Saskatchewan breeders. The popularity of Barred Plymouth Rocks in Saskatchewan is illustrated by the fact that 64 pens or over half of all entries received were of this variety. Entries of other breeds were as follows: White Leghorns, 31; White Wyandottes, 15; Rhode Island Reds, 7; Anconas, 2. A total of 179 pullets qualified in these contests and were registered by the Canadian National Poultry Records Association, Ottawa.

Winners of the six most recent Saskatchewan contests on the basis of total points scored by pens were: N. R. James, Strasbourg, Sask., (3 firsts, 1 second); Henry Barton, Davidson, Sask., (1 first); W. Burdett, Bredenbury, Sask., (1 first); and W. S. McAlpine, Crestin, B.C., (1 first).

OTTAWA: Printed by J. O. PATENAUDE, I.S.O., Printer to the King's Most Excellent Majesty, 1937.