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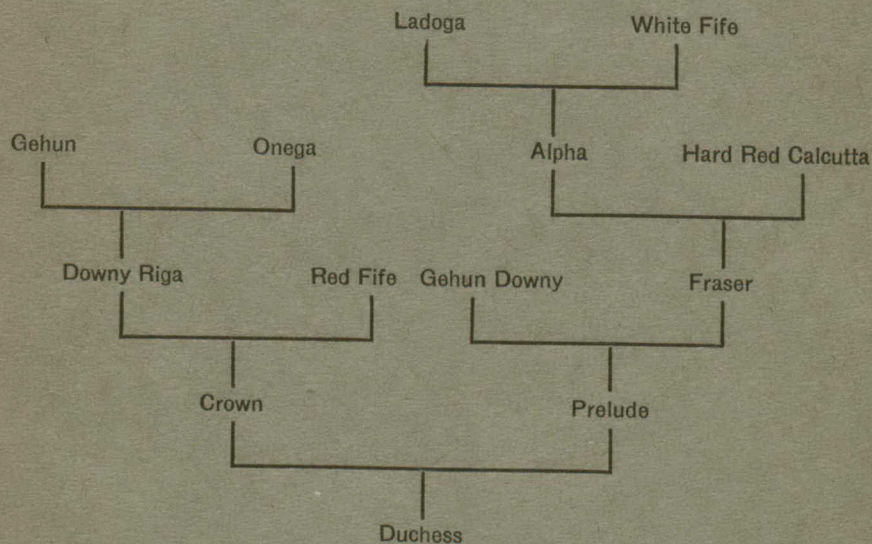
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NEW VARIETIES AND SELECTIONS OF GRAIN

ORIGINATED ON THE DOMINION
EXPERIMENTAL FARMS.

CHAS. E. SAUNDERS, B.A., Ph.D., LL.D., F.R.S.C
Dominion Cerealist



A Long Pedigree in Wheat

DIVISION OF CEREALS
DOMINION EXPERIMENTAL FARMS

DOMINION OF CANADA
DEPARTMENT OF AGRICULTURE
BULLETIN No. 11—NEW SERIES

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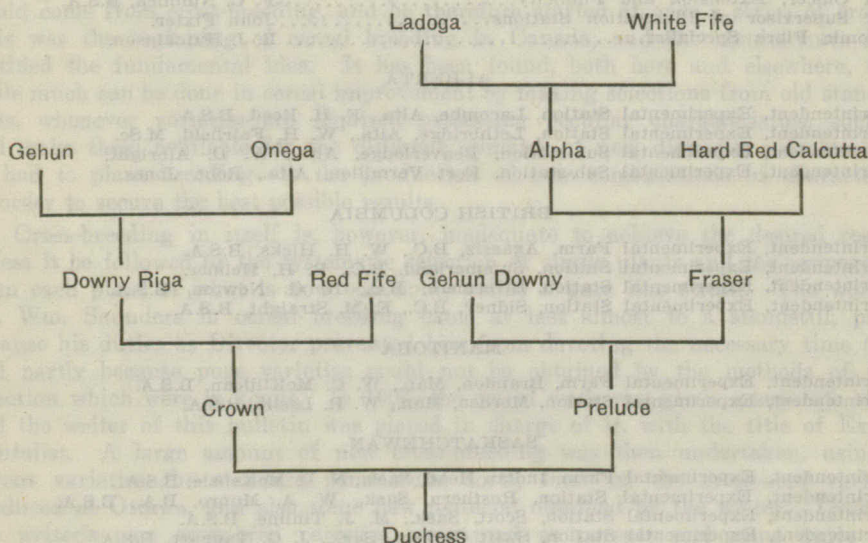
Published by direction of the Hon. W. R. Motherwell, Minister of Agriculture,
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New Varieties and Selections of Grain originated on the Dominion Experimental Farms from their inception to the Year 1922.

When the Dominion Experimental Farms were established in the year 1887, with Dr. Wm. Saunders as Director, attention was given at once to the important problem of obtaining improved varieties of cereals suitable for the varied soils and climates of Canada. Early-maturing wheats for districts where the summer season is short were especially sought after. Arrangements were made thoroughly to test such varieties as were well-known in this country and numerous other sorts were imported from abroad. However, Dr. Saunders was of the opinion that the greatest success would come from cross-breeding, and he therefore started at once a series of crosses. This was the beginning of cereal breeding in Canada, and the results have fully justified the fundamental idea. It has been found, both here and elsewhere, that, while much can be done in cereal improvement by making selections from old standard sorts, whenever varieties are required possessing peculiar characteristics, such as will make them available for the different climates of new districts, recourse must be had to plant breeding—to the production of new combinations of characters—in order to secure the best possible results.

Cross-breeding in itself is, however, inadequate to achieve the desired results, unless it be followed by the systematic selection of single plants and the propagation from each plant of what is now commonly called a pure line strain. The work of Dr. Wm. Saunders in cereal breeding came at last almost to a standstill, partly because his duties as Director prevented him from devoting the necessary time to it, and partly because pure varieties could not be obtained by the methods of mass selection which were in vogue. In 1903, the cereal work was given a separate status and the writer of this bulletin was placed in charge of it, with the title of Experimentalist. A large amount of new cross-breeding was then undertaken, using as parent varieties the standard commercial sorts, some of the cross-bred varieties produced at Ottawa, and also some new material obtained by the writer. Later on, the writer's own cross-bred varieties were used as parents and some quite long pedigrees were established. The chief change which the writer made in the method of work was the introduction of the plan of selection by single plants, to replace the old, mass selection. This at once made further progress possible and very soon a large number of pure, uniform varieties, such as had never before been seen in Canada, were obtained. The introduction by the writer of the chewing test and the baking test for wheat (see Bulletin No. 97) enabled him to discover single plants of high merit (which would otherwise have escaped notice, occurring, as they sometimes did, in quite unpromising material) and to prove the value of the new varieties when established. Without the adoption of these new ideas and methods, the cereal work would have remained unsatisfactory and relatively unprofitable, and some of the most important discoveries—Marquis wheat for instance—would never have been made.

The life-history and origin of the varieties mentioned herein are given in the detailed descriptions.

Very little is known as to the history and origin of most of the common varieties of cereals in Canada, but since by far the largest proportion of these trace back to breeding and selection work carried on by the Experimental Farms, it would seem proper and desirable that the attention of the public should be drawn to this.

E. S. ARCHIBALD,
Director of Experimental Farms.

Descriptions have been published from time to time, in the reports and bulletins of the Dominion Experimental Farms, of the new varieties of grain originated at those institutions, in so far as these new sorts were being offered to the public. It seems desirable, at the present juncture, to assemble these descriptions in one publication and to add to them some hitherto unpublished details. Only the varieties which have attracted special attention or are of particular promise will be mentioned. In the early days, many sorts were named which never came into prominence, and in later years hundreds of new kinds were grown and studied under numbers and were rejected without ever having been named.

The new varieties fall naturally into five groups according to the date and manner of their production and discovery.

Group I. New varieties produced and named by Dr. Wm. Saunders and his assistants. All of the nine sorts mentioned as belonging to this group were reselected by the present writer, in 1903 or subsequently, but this reselection, while improving the varieties somewhat, did not materially alter them. Their original names were therefore retained. These varieties are:—

Spring Wheats.—Alpha, Bishop, Huron, Percy, Preston, and Stanley.

Barley.—Stella.

Field Peas.—Arthur and Mackay.

Group II. New varieties discovered by the writer among cross-bred varieties of unfixed character, which came from crosses made by Dr. Wm. Saunders and his assistants, and which were handed over to the writer in 1903. As in these instances the pure line strain which was selected out differed very considerably from the impure, parent sort in which it was found, a new name was always given to the new, fixed variety, except in the case of Albert barley. There are four kinds worthy of mention in this group:—

Spring Wheats.—Chelsea, Marquis, and Yellow Cross.

Barley.—Albert.

Group III. Pure line strains selected by the writer from commercial grain. In some cases (such as Early Red Fife wheat and Early Chevalier barley) the selected strain showed such distinct individuality that a new name had to be chosen for it, while in other instances (such as Red Fife wheat and Banner oats), the new selection did not differ very much from the parent sort. There are twenty-eight varieties belonging to this group.

Spring Wheats.—Early Red Fife, Early Russian, Kubanka, Red Fife, White Fife.

Oats.—Banner, Columbian, Daubeney, Eighty-Day, Prolific.

Barley.—Chinese, Duckbill, Early Chevalier, Himalayan, Manchurian.

Spring Rye.—Select.

Winter Rye.—Dominion.

Peas.—Chancellor, Early Blue.

Flax.—Blanc, Damask, Longstem, Novelty.

Beans.—Beauty, Large White, Navy, Norwegian.

Sunflowers.—Early.

Group IV. This group consists of cross-bred, selected varieties originated by the writer. (As to the life history and origin of these varieties see detailed descriptions below.) Thirty-one varieties belong to this group:—

Spring Wheats.—Brownie, Crown, Duchess, Forward, Garnet, Major, Master, Pioneer, Piper, Prelude, Producer, Prospector, Reward, Ruby, Tartan.

Oats.—Laurel, Legacy, Liberty, Longfellow.

Barley.—Bearer, Feeder, Fenil, Forage, Junior.

Peas.—Cartier, Champlain, Early Feed.

Emmer.—Early Emmer.

Beans.—Carleton, Petite.

Flax.—Diadem.

Group V. In this group are placed two new selections of barley, made by superintendents of branch Experimental Farms, Charlottetown No. 80 and Manchurian, Cap Rouge No. 14.

DESCRIPTIONS OF NEW VARIETIES

(The varieties are arranged in alphabetical order under each heading.)

SPRING WHEATS

Alpha, Ottawa 1.—From a cross between Ladoga and White Fife made in 1888 by Dr. A. P. Saunders. Reselected in 1903 but finally rejected. Heads beardless, with smooth, yellowish chaff; kernels red. Fairly early in ripening but with a rather low weight per bushel, as a rule. Its baking qualities were good.

Bishop, Ottawa 8.—The original variety came from a cross between Ladoga and Gehun made by Mr. W. T. Macoun in 1891. A pure line selection, made in 1904, received the Ottawa number as above. The heads carry short awns, particularly at the tip. The chaff is smooth and yellowish and the kernels are yellowish. The unripe straw is heavily covered with bloom. Ripens decidedly early and gives a good yield of rather plump grain. The flour is of very fair colour and strength, though inferior to the best sorts. This variety has done very well in some districts quite far north; but, on account of the yellow colour of the kernels and the somewhat inferior quality of the flour, it is not recommended for general cultivation.

Brownie, Ottawa 491.—This wheat (originally designated 491A) comes from a cross made in 1904 between Yellow Fife and Onegafife. Yellow Fife was a selection made from the original Bishop (which was not quite fixed in type) and Onegafife was a cross between Onega and Red Fife. Brownie has smooth, reddish-brown chaff and the heads carry some short awns at the tip. It ripens earlier than Marquis, has good straw and gives a large yield. The kernels are red, usually plump, and yield flour of good colour and high baking strength.

Chelsea, Ottawa 10.—A pure-line selection made in 1903 from a mixed variety called Chester which had come from a cross between Alpha and Gehun made in 1892 by Dr. A. P. Saunders. Heads beardless but carrying a few short awns, chaff smooth, yellowish. Before commencing to ripen, the heads are of an unusual yellowish-green colour. The kernels are hard, red. The flour is of very fair colour and baking strength. This variety ripens before Marquis and gives a very large yield of grain. Its straw is not very strong.

Crown, Ottawa 353.—Formerly designated as 353A 1B. Comes from a cross made in 1903 between Downy Riga and Red Fife. Downy Riga was a pure line selection from Early Riga which latter resulted from a cross between Gehun and Onega. The heads can fairly be described as beardless, though they carry short awns. The chaff is smooth and yellowish. The kernels are red and hard. This wheat ripens before Marquis, has very good straw, gives a large yield of (usually) plump grain and produces flour of very good colour and high baking strength.

Duchess, Ottawa 933.—Formerly 933A 1C. The pedigree of this variety is shown diagrammatically. It is probably the longest pedigree on record in the history of cereal breeding. Of the six crosses involved, three were made by the assistants of Dr. Wm. Saunders, previous to 1903, and the others were made by the writer of this bulletin, the last cross being accomplished in 1912. Duchess is certainly an aristocrat among wheats and is of great promise. The heads are beardless, the chaff smooth and yellowish, and the kernels hard, red and of very high weight per bushel. This wheat ripens almost as early as Ruby, has good straw and gives a high yield. It produces flour of good colour and strength. The kernels are held more tightly in the head than are those of Ruby.

Early Red Fife, Ottawa 16.—A pure line selection made in 1903 from ordinary Red Fife. This variety differs chiefly in two respects from the parent sort: it is distinctly earlier in ripening and the heads instead of being pointed at the tip are somewhat blunt. The heads have short awns at the tip, the chaff is smooth and yellowish, and the kernels are rather large, red and hard. The flour is of very good colour and strength. This variety ripens about with Marquis and, as a rule, yields considerably more than ordinary Red Fife. In some parts of central Canada, Early Red Fife seems particularly subject to rust, but in the eastern provinces this defect has not been noticed.

Early Russian, Ottawa 40.—A pure line selection of early ripening habit obtained out of some commercial wheat of Russian origin and labelled Gurke. Selected in 1903. The heads taper at both ends and may be described as beardless though they carry some short awns. The chaff is smooth and yellowish, and the kernels are red, rather soft, rather long, and of good weight per bushel. This variety ripens with Marquis or slightly earlier. It gives an exceptionally large yield but is at a disadvantage on account of the straw being weak. It produces flour of good colour and of medium or above medium baking strength.

Forward, Ottawa 136.—Prelude wheat, in spite of the care with which it was originally selected, has shown a tendency to produce sports. A number of these have been propagated and studied. The most promising of all has been given the above name. Its original designation was "Prelude, Strain Y". It ripens about two or three days later than the parent sort and appears to be somewhat more productive, though its weight per bushel is lower. The heads are beardless with some short awns at the tip. The chaff is yellowish and downy. The kernels are hard, red and usually heavy. They thresh out easily. This variety produces flour of high baking strength and of very fair colour.

Garnet, Ottawa 652.—Originally designated 652 B. This comes from a cross made in 1905 between Preston A and Riga M (two pure line selections which were afterwards rejected). Riga M was a smooth-chaff selection from Early Riga (a cross between Gehun and Onega). Heads tapering at both ends, essentially beardless but carrying some short awns, especially at the tip. Chaff smooth, yellowish. Kernels hard, red. This variety ripens earlier than Ruby, has straw of fair strength, and gives a large yield of grain of very high weight per bushel. The baking strength and colour of the flour are both good.

Huron, Ottawa 3.—This is a reselection made in 1903 from the original Huron which is a cross between Ladoga and White Fife made in 1888 by Dr. A. P. Saunders.

Heads bearded, carrying long, spreading awns. Chaff smooth, reddish. Kernels long, hard, red. Easy to thresh. Straw long and exceptionally stiff. Ripens with Marquis and gives a good yield. Huron adapts itself particularly well to varied and even to unfavourable conditions of soil and climate. It yields flour of a rather yellowish colour, and not of the highest strength for bread-making.

Kubanka, Ottawa 37.—This pure line selection, originally designated Kubanka A, was made from Kubanka No. 5639 obtained from the Department of Agriculture, at Washington, D.C. The heads are of the ordinary durum wheat type: compact and with long awns. The chaff is smooth with a slight reddish tinge. Kernels very hard, long, yellowish. Straw long and rather weak. This variety matures somewhat late. It is best adapted for rather dry districts.

Major, Ottawa 522.—Original designation 522 A. Comes from a cross made in 1904 between Aurora (a pure line selection from Gehun) and Red Fife. Heads carry a few short awns, especially towards the tip. Chaff smooth, yellowish. Kernels hard, red and of medium size. Straw long and of fairly good strength. Ripens between Marquis and Ruby. Very productive. The colour of the flour is very good and the baking strength usually high.

Marquis, Ottawa 15.—The single head from which this variety was propagated was discovered by the writer of this bulletin in the winter of 1903-04 while applying the chewing test to a large number of heads gathered under many varietal names during the previous summer. The kernels which were tested from this head gave indications of exceptional baking qualities, and the remainder were therefore set aside for propagation, which was begun in 1904. The original, mixed variety (Markham) from which Marquis was obtained came from a cross made in 1892 by Dr. A. P. Saunders between Hard Red Calcutta and Red Fife. Marquis is beardless but has some short awns at the tip of the head. Kernels hard, rather dark red, short, usually plump and held tightly in the smooth, yellowish chaff. Straw somewhat below maximum length and exceptionally strong. This variety ripens moderately early and is very productive, especially on heavy soils in climates that are not too moist. It yields flour of excellent colour and of the highest baking strength. Marquis has become the recognized standard variety in Canada and in most of the United States where spring wheat is grown.

Master, Ottawa 520.—Formerly designated 520 B 4. From a cross made in 1904 between Aurora (a selection from Gehun) and Red Fife. Heads carry some awns at the tip but are essentially beardless. Chaff smooth, yellowish. Kernels hard, red, somewhat elongated. Straw stiff and moderately long. Ripens a little before Ruby and gives a large yield. The flour is very good in colour and in baking strength.

Percy, Ottawa 2.—Came from a cross between Ladoga and White Fife made in 1888 by Dr. A. P. Saunders. Heads beardless, chaff yellowish, kernels hard, red. This variety was finally discontinued as it proved to be inferior to Huron.

Pioneer, Ottawa 195.—Obtained by crossing, in 1903, Riga with Preston. Riga was a smooth-chaff selection from Early Riga (which was a cross between Gehun and Onega). Heads bearded; chaff smooth, yellowish; kernels hard, red, threshing out easily. Productive; straw not very strong. Ripens a little later than Ruby. Produces flour of first-class colour and strength. Chiefly because of its awns, Pioneer, which was never as popular as it deserved to be, is gradually being replaced by Ruby.

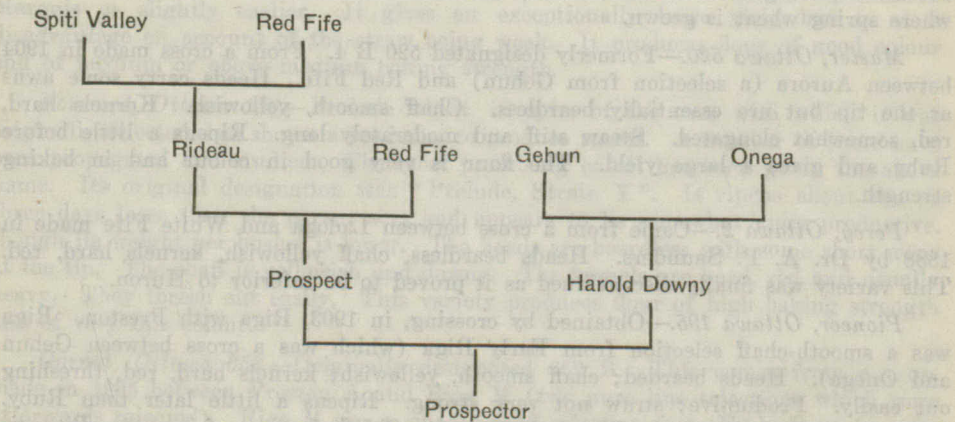
Piper, Ottawa 728.—Formerly 728 A. Comes from a cross made in 1908 between two pure line strains obtained from Red Fife, namely Red Fife Ottawa 17 and Early Red Fife Ottawa 16. Heads slightly blunt and carrying some awns at the tip. Chaff smooth, yellowish. Kernels red, moderately hard. Flour colour and baking strength good. Resembles Early Red Fife and ripens about with that variety, but gives some indications of superiority.

Prelude, Ottawa 135.—From a cross made in 1903 between Gehun Downy and Fraser. Gehun was a very early variety from India. Fraser came from a cross between Alpha and Hard Red Calcutta. (See pedigree of Reward wheat). Prelude is a bearded variety, with downy, yellowish chaff and very hard kernels of a red colour. It is the earliest wheat in cultivation in Canada, ripening several days before Ruby. Prelude gives a fair yield and produces short, fine straw which, however, is strong enough to hold up the heads, which are usually small. This variety has an exceptionally high weight per measured bushel, being frequently two or even three pounds heavier than Marquis. It yields flour of high baking strength but not of the best colour. As the kernels are not at all tightly held by the chaff, Prelude should always be cut on the green side to avoid loss, particularly in windy climates.

Preston, Ottawa 4.—A pure line selection made in 1904 from the original Preston which was a cross between Ladoga and Red Fife made in 1888 by Dr. Wm. Saunders. Heads strongly bearded; chaff yellowish, smooth; kernels hard, red, rather long. Except for the colour of the chaff, this variety is almost identical with Huron Ottawa 3. The latter, however, appears to be slightly superior, on the whole. Both Preston and the Ottawa 4 strain were therefore rejected, after being grown for a number of years.

Producer, Ottawa 197.—Under its original designation, 197 C, this variety made an extraordinary record for productiveness at the Experimental Station at Lacombe. It is of the same pedigree as Pioneer, but differs from that variety in being beardless. The chaff is yellowish, smooth and the kernels are hard, red. This wheat ripens with Marquis. It has rather long straw of fair strength. It produces flour of good strength and colour but not in the highest class.

Prospector, Ottawa 444.—Original designation 444 D. The pedigree of this variety is shown in diagrammatic form. Heads beardless but with short awns at the tip; chaff downy, yellowish; kernels red, medium hard. Straw of medium length but not very strong. Productive and very early in ripening. The kernels show a very heavy weight to the measured bushel. The baking strength and the colour of the flour are first class.

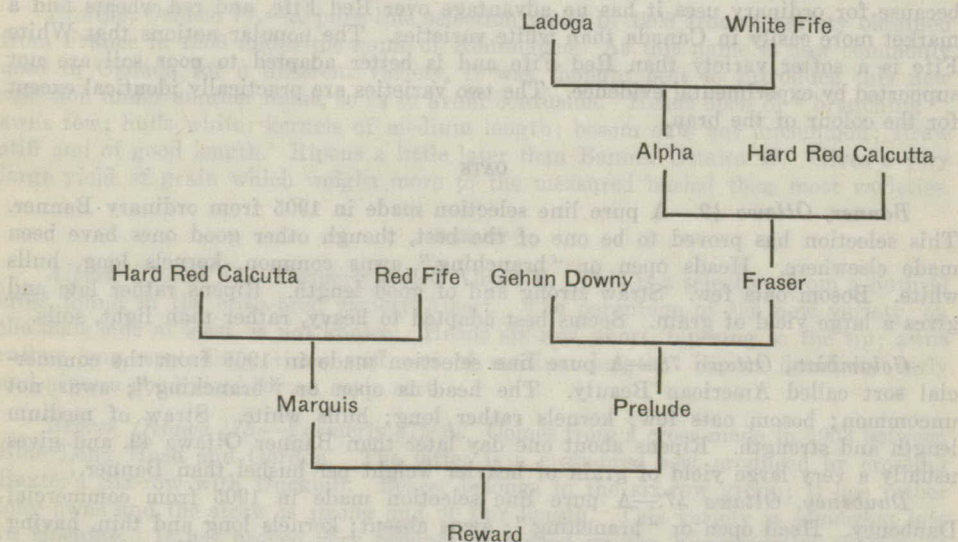


The cross between Spiti Valley and Red Fife was made in 1889 by Dr. Wm. Saunders; that between Gehun and Onega was made in 1891 by Mr. W. T. Macoun; that between Rideau and Red Fife was made in 1896 by the writer; and that between Prospect and Harold Downy was made in 1903 by the writer.

Red Fife, Ottawa 17.—A pure line selection from ordinary Red Fife made in 1903. Heads beardless but with a few short awns at the tip; chaff yellowish, smooth;

kernels red, hard. Late in ripening, though it appears to be about a day earlier than common Red Fife. Straw of fair length and good strength. Productive, but does not yield so much as some of the more recently introduced wheats. In the first class for strength and colour of flour.

Reward, Ottawa 928.—Formerly 928 SS 2. From a cross made in 1912 between Marquis and Prelude. Heads beardless; chaff smooth, yellowish; kernels dark red, hard. Very early to ripen and yielding a large crop of grain of extraordinarily heavy weight per bushel. Straw strong and of medium length. Yields flour of very good strength and colour.



Ruby, Ottawa 623.—Comes from a cross made in 1905 between Downy Riga G (a pure line selection from Early Riga, which was a cross between Gehun and Oneга) and Red Fife D (a pure line selection from Red Fife). Heads rather short and carrying a few short awns towards the tip. Kernels hard, red and of rather below average size. The weight per measured bushel is generally quite high. As the kernels are not tightly held by the chaff this wheat should be cut on the green side in most districts. Ruby usually ripens a week or more before Marquis but does not give so large a crop where the season is long. The straw is of moderate length and strength. This variety yields flour of very good colour and strength, but shows perhaps greater seasonal fluctuations in quality than most sorts.

Stanley, Ottawa 5.—A pure line selection made in 1903 from the original variety which was a cross between Ladoga and Red Fife made by Dr. Wm. Saunders in 1888. Heads beardless with smooth, reddish chaff. Kernels rather long, red, fairly hard. This variety proved to be inferior to Huron in some respects and was therefore rejected.

Tartan, Ottawa 731.—Formerly 731 B. Of the same parentage as Piper. Heads essentially beardless but carrying some short awns; chaff smooth, yellowish, kernels red, hard. Flour colour and baking strength good. Ripens with Early Red Fife but promises a larger yield.

Yellow Cross, Ottawa 14.—A pure line selection made in 1904 from a variety called Plumper which was a cross between Colorado and Gehun made in 1891 by Mr. W. T. Macoun. Heads bearded, chaff yellowish, downy; kernels yellowish, moderately hard. Ripens early. This variety proved very interesting from the point

of view of a baker because flour made from it was low in baking strength when new, but after a year of storage became very strong. Yellow Cross was rejected after several years' test.

White Fife, Ottawa 11.—A pure line selection made in 1903 from ordinary White Fife. The selection does not differ materially from the parent sort except in purity, White Fife as found in commerce being usually from 20 to 50 per cent impure. The heads taper at both ends and have some short awns at the tip. Chaff yellowish, smooth; kernels yellowish, hard. Ripens with Red Fife. Yields flour of the same quality and colour as that produced by Red Fife. White Fife was finally rejected because for ordinary uses it has no advantage over Red Fife, and red wheats find a market more easily in Canada than white varieties. The popular notions that White Fife is a softer variety than Red Fife and is better adapted to poor soil are not supported by experimental evidence. The two varieties are practically identical except for the colour of the bran.

OATS

Banner, Ottawa 49.—A pure line selection made in 1905 from ordinary Banner. This selection has proved to be one of the best, though other good ones have been made elsewhere. Heads open or "branching," awns common, kernels long, hulls white. Bosom oats few. Straw strong and of good length. Ripens rather late and gives a large yield of grain. Seems best adapted to heavy, rather than light, soils.

Columbian, Ottawa 78.—A pure line selection made in 1908 from the commercial sort called American Beauty. The head is open or "branching"; awns not uncommon; bosom oats few; kernels rather long; hulls white. Straw of medium length and strength. Ripens about one day later than Banner Ottawa 49, and gives usually a very large yield of grain of heavier weight per bushel than Banner.

Daubeney, Ottawa 47.—A pure line selection made in 1905 from commercial Daubeney. Head open or "branching"; awns absent; kernels long and thin, having usually a rather small proportion of hull to kernel; hulls white. Bosom oats few. Straw a few inches shorter than Banner and of almost equal strength. Ripens very early and gives a good yield of grain.

Eighty-Day, Ottawa 42.—A pure line selection from the mixed commercial sort called Sixty-Day or Orloff. Heads open or "branching"; kernels of medium length but thin; colour of hull white; bosom oats few; straw short and strong. This variety is one of the very earliest to ripen and is indeed quite unnecessarily early for almost all districts. Eighty-Day usually matures at Ottawa in about eighty days. It is not later in ripening than the Sixty-Day parent sort. As Eighty-Day is inferior to Daubeney in yield, in size of kernel and in weight per measured bushel, the latter sort is generally preferred when a very early variety is required.

Laurel, Ottawa 477.—Formerly 477 X. This is a hullless variety derived by selection from a cross made in 1903 between Banner and Chinese Naked. Heads open or branching; awns very rare; kernels quite large; often has 4 and sometimes 5 kernels in a spikelet; straw of medium length, stiff. Ripens about with Banner. This variety is not so early as Liberty but the kernels are larger and the weight per measured bushel is greater than in the latter sort.

Legacy, Ottawa 678.—Formerly 678 E. Comes from a cross made in 1906 between Banner Ottawa 49 and Eighty-Day Ottawa 42. Heads open or "branching"; awns absent; hull white; kernels rather long and thin; straw stiff and of medium length. Ripens rather early and gives a good yield.

Liberty, Ottawa 480.—A hullless variety obtained by crossing Chinese Naked with Swedish Select. The cross was made in 1903 and the new variety was introduced in 1917. Heads open or "branching"; awns rare; kernels of about medium size;

often has 4 and sometimes 5 kernels in a spikelet. Ripens early. Straw stiff and rather long. Gives a fair yield. A field of this variety is very striking in appearance, quite different from ordinary oats.

Longfellow, Ottawa 478.—Formerly 478 D. Comes from a cross made in 1903 between Tartar King and Banner. Heads compact or "sided"; awns numerous; hulls white; bosom oats common; straw decidedly long and quite stiff. Ripens with Banner Ottawa 49 or a trifle earlier. Gives a good yield of fairly heavy oats. This variety may prove useful in some localities on account of its unusual length of straw.

Prolific, Ottawa 77.—A pure line selection made in 1908 from a variety obtained from France in 1903 under the name of Abundance. As this name is now commonly used in Canada for a different variety, it was thought best to introduce this new selection under another name, so as to avoid confusion. Heads open or "branching"; awns few; hulls white; kernels of medium length; bosom oats not uncommon; straw stiff and of good length. Ripens a little later than Banner Ottawa 49. Gives a very large yield of grain which weighs more to the measured bushel than most varieties.

BARLEY

Albert, Ottawa 54.—Formerly called Albert B. This is a selection from a natural cross found in the cross-bred variety Albert. The parentage of the new variety, on the male side at least, is not known. Heads six-row, short, tapering to the tip; awns rather long, spreading; straw stiff and of medium length. Ripens decidedly early and gives a good yield for an early sort.

Bearer, Ottawa 475.—Formerly 475 A. Comes from a cross made in 1903 between Blue Long Head and Gordon. The latter is a cross-bred sort produced by crossing Baxter's Six-row with Duckbill. Bearer belongs to the six-row group; it has rather long awns and the straw is strong and of fair length. This variety is somewhat late in ripening. It has proved very productive indeed on the Experimental Station at Lacombe, Alberta.

Charlottetown, No. 80.—This is a selection made by Mr. J. A. Clark, Superintendent of the Experimental Station at Charlottetown, P.E.I., from Old Island Two-row, a well-known commercial sort of the Chevalier type. The heads are fairly long and bearded, but the awns have a tendency to drop towards or during the harvest, so that in some cases the barley is almost free from awns when threshed. This variety produces a strong straw of moderate length. It ripens late and gives a very good yield of rather large, plump grain.

Chinese, Ottawa 60.—A pure line selection from the commercial sort from which Manchurian, Ottawa 50 was obtained. Heads six-row; awns rather long; kernels (when hull has been removed) of a slight bluish tint, which distinguishes them from Manchurian, Ottawa 50. The straw is of good length and strength and the grain ripens about with other common six-row sorts. At Ottawa, this variety in an eleven-year average has yielded considerably more than either Manchurian or O.A.C. No. 21, both of which it resembles.

Duckbill, Ottawa 57.—A pure line selection from the commercial Duckbill which it closely resembles. Heads two-row, rather broad at the base and tapering somewhat to the tip, of medium length, bearded; awns long. Straw strong and of fair length. Kernels rather large and showing a high weight to the measured bushel. Ripens late and gives a good yield, which however is usually inferior to that of the best six-row varieties.

Early Chevalier, Ottawa 51.—A pure line selection out of French Chevalier from which it differs materially in being of early ripening habit. The new selection which

was discovered in 1904 matures rather earlier than most of the common six-row sorts. The heads are of the two-row type, of medium length, narrow, scarcely tapering at all. The straw is long but of only medium strength. The yield is generally good and the weight per measured bushel is fair, though inferior to that of some other two-row sorts.

Feeder, Ottawa 561.—Formerly 561 C. Comes from a cross between Champion (six-row, hooded) and French Chevalier (two-row, bearded). The cross was made in 1904. The heads are of the six-row type, tapering towards both ends and hooded. The straw is strong and of good length. This variety ripens early and gives a large yield. It is of interest for the production of hay as well as for use as a grain crop to those farmers who object to the awns of ordinary barley.

Fenil, Ottawa 670.—Formerly designated as 670 B. This comes from a cross made in 1905 between Mensury (six-row, bearded) and Triple Naked Two-row (hooded, hullless). The heads are of the six-row type, hooded and quite long. The kernels thresh out free from hull and are of a yellowish colour. The straw is very long and of only medium strength. This variety ripens rather late. It is of interest for hay production rather than for its yield of grain.

Forage, Ottawa 675.—Formerly 675 A 2 B. From a cross between Triple Naked Two-row (hooded, hullless) and Mensury (six-row, bearded). Heads of the six-row type, long, hooded. The kernels thresh out free from hull. The straw is long and strong. This variety is rather late in ripening. Expected to be of interest chiefly for the production of hay.

Himalayan, Ottawa 59.—A pure line selection from the commercial sort called Guymalaye (or Guy Mayle). This variety is of the six-row type and carries awns of medium length. The kernels thresh out free from hull and are of a greenish colour. The straw is short and rather weak, but the yield and quality of grain are usually quite good. Early in ripening.

Junior, Ottawa 471.—Former designation 471 D 3. Comes from a cross made in 1903 between Odessa and Hullless White. Heads six-row, bearded, short. The kernels come out free from hull when threshed and are of a yellowish colour. Straw strong but very short. Gives a fair yield and ripens very early.

Manchurian, Ottawa 50.—A pure line selection from some commercial barley supposed to be of Asiatic origin. This is a very good variety but is surpassed by Chinese Ottawa 60 by which it is being replaced. These two selections resemble each other very closely but can be distinguished by the fact that the kernels of Manchurian (when stripped of their hull) are of a yellowish colour while those of Chinese show a slight bluish tint.

Dr. G. A. Langelier, Superintendent of the Experimental Station at Cap Rouge, reselected Manchurian Ottawa 50 a few years ago, and obtained a strain which has given much better results thus far than the parent sort. The new strain is designated as Cap Rouge No. 14.

Stella, Ottawa 58.—This is a pure line selection (formerly designated Stella G) made in 1910 from the original Stella which came from a cross between Swedish and Baxter's Six-row. Heads of the six-row type, bearded; straw strong and of medium length. Ripens at about the same time as most six-row varieties and gives a good yield of grain.

PEAS

Arthur, Ottawa 18.—A pure line selection from the original Arthur, which was a cross, made in 1892, by Dr. A. P. Saunders between Mummy and Multiplier. Flowers white, borne chiefly at the tips of the very coarse stems; seeds yellow, of medium size. This variety ripens rather early and gives a good yield.

Cartier, Ottawa 19.—Formerly 19 B 1. Derived from a cross made in 1903 between Mackay and Arthur. The flowers are white, borne terminally; seeds yellow, round, of medium size. This variety ripens at about the same time as Arthur and has proved more productive, at Ottawa, in a ten-year test.

Champlain, Ottawa 32.—Formerly 30 K 2. This comes from a cross made in 1903 between Arthur and Early Britain. The flowers are white, borne terminally; seeds yellow, round. This variety ripens a little earlier than Arthur and has given a larger yield at Ottawa.

Chancellor, Ottawa 26.—Formerly Chancellor D. A pure line selection from an old sort known as Chancellor. The selection ripens decidedly early—earlier than the parent. Flowers white, borne axially; seeds yellow, small. This variety gives a fair yield and may prove very valuable in some districts on account of its earliness.

Early Blue, Ottawa 21.—A pure line selection made in 1915 from a mixed commercial sort obtained under the name of Rough English Marrowfat. The flowers are white and the seeds pale blue of about medium size. This variety is extremely early in ripening and gives, nevertheless, a good yield. It is one of the most promising of the very early sorts.

Early Feed, Ottawa 30.—Formerly 30 D. Comes from a cross made in 1903 between Arthur and Early Britain. Flowers coloured, axial; seeds greenish and brownish, not speckled, fairly regular in shape and of medium size. This variety ripens earlier than Arthur and gives a good yield.

Mackay, Ottawa 25.—A pure line selection made from the original Mackay which was a cross made in 1892 by Dr. A. P. Saunders between Mummy and Black Eye Marrowfat. Mackay has white, axial flowers. The peas are round and yellow, but darker than most sorts and with a black hilum (eye). This variety grows long and ripens rather late. It is extremely productive.

SPRING RYE

Select, Ottawa 12.—A pure line selection from common spring rye, from which it does not differ materially, except that it gives a larger yield.

WINTER RYE

Dominion, Ottawa 13.—A productive, pure line selection from common winter rye. Satisfactory in most parts of Canada both as to yield and hardiness, but winter-kills sometimes in the northern parts of the central provinces. Not noticeably different in appearance from ordinary winter rye.

EMMER

Early Emmer, Ottawa 44.—Former designation 44 G. This comes from a cross made in 1903 between a variety of Durum wheat to which the name Red Indian was given, and Common Emmer. It does not retain its hull as well as some of the emmers, but it cannot be classified as a true wheat. It has a compact, bearded head, and stiff straw of good length. The kernels are red in colour and long in shape. This variety ripens several days before Common Emmer (the best of the old sorts) and has given a heavier yield in a six-year average at Ottawa.

BEANS

Beauty, Ottawa 712.—A pure line selection from a natural cross found at Ottawa. The exact parentage of this variety is not known. The bean is of rather small size. Its colour varies somewhat from season to season, but is typically white with pale brownish and greenish markings. The plant is short in growth, ripens early and gives a fair yield.

Carleton, Ottawa 718.—Formerly 718 D. Comes from a cross made in 1907 between Improved Golden Wax and Challenge Black Wax. This bean is rather long in form and the colour varies from white with brown markings to essentially brown with a few white markings. The plant is very short and extremely early in ripening. The yield is good, considering the earliness of the variety.

Large White, Ottawa 713.—This is, as its name implies, a pure white variety of rather large size. It comes from a natural cross and its parentage is not definitely known. The plants are rather short in growth and somewhat early in ripening. The yield is good. These beans soften and break up unusually rapidly when cooked.

Navy, Ottawa 711.—Formerly designated Navy A. This is a pure line selection from the commercial Navy bean, from which it does not differ very much. The plants grow quite long and are rather late in maturing. The beans are white and of medium or below medium size. This is a very productive variety.

Norwegian, Ottawa 710.—A pure line selection from a variety received many years ago from Norway. This is a yellowish-brown bean of medium size and elongated form. It is not claimed that it is very different from similar brown beans grown under other names. Its extreme earliness makes it of particular interest. At Ottawa, when sown towards the end of May, it usually ripens in about ninety days. The plants are very short and the pods rather long. The yield is large—remarkably large for so early a variety. These beans retain their individual shape when cooked and do not readily break up, though they become soft.

Petite, Ottawa 709.—Formerly 709 D. Comes from a cross made in 1907 between Challenge Black Wax and Improved Golden Wax. The plants are very short and the beans are small. In colour they are white with some dark patches. This variety is early in ripening and gives a fair yield. It has been named Petite, and not Petit, because in French Canada the word *fève* is almost invariably used for *bean* instead of *haricot*, the word employed in France.

FLAX

Blanc, Ottawa 62.—Former designation White E 3. This is a pure line strain from a white-flowering plant (found in 1910) which appeared to be a sport or the result of a natural cross. The flowers are large and the seeds brown and of medium size. This variety is early in ripening and a good yielder. The plant is not very tall but might be satisfactory for fibre purposes, if grown under favourable conditions.

Damask, Ottawa 61.—Formerly designated as Common D. A pure line strain from common, commercial flax. Very early in ripening and tall enough probably to be useful for fibre production. Seeds brown, small. The yield of seed is not very good.

Diadem, Ottawa 787.—Formerly 787 B. Comes from a cross made in 1910 between La Plata A and White Flowering B. It has rather large, white flowers. The seeds are brown in colour and rather above average size. The plant is probably too short for fibre purposes, but the early ripening habit and the very large yield of seed make this variety promising for seed production.

Longstem, Ottawa 52.—A pure line selection from some seed obtained from Ireland. Flowers blue, seed brown and rather small. This variety is exceptionally tall and has given very good results for fibre purposes. Its yield of seed is small.

Novelty, Ottawa 53.—Former designation Novarossick B. A pure line selection from flax supposed to be of Russian origin. Flowers blue, seeds slightly larger than the average and of a somewhat paler brown colour. Produces rather short plants and ripens a little later than most varieties. Gives a very large yield of seed.

SUNFLOWERS

Early, Ottawa 76.—This variety was obtained by selection from commercial Mammoth Russian. It was propagated twice (in successive years) from a single plant but is not entirely uniform in type. In sunflowers, strict uniformity can scarcely be obtained. It is rather short and ripens decidedly early. While intended primarily for the production of seed for feeding to chickens, this selection may be of use for ensilage purposes in some northern localities.

LIST OF OTTAWA VARIETIES ARRANGED IN THE ORDER OF THEIR NUMBERS

Ottawa Number	Name	Ottawa Number	Name
1	Alpha wheat	61	Damask flax
2	Percy wheat	62	Blanc flax
3	Huron wheat	76	Early sunflower
4	Preston wheat	77	Prolific oat
5	Stanley wheat	78	Columbian oat
8	Bishop wheat	135	Prelude wheat
10	Chelsea wheat	136	Forward wheat
11	White Fife wheat	195	Pioneer wheat
12	Select (spring) rye	197	Producer wheat
13	Dominion (winter) rye	353	Crown wheat
14	Yellow Cross wheat	444	Prospector wheat
15	Marquis wheat	471	Junior barley
16	Early Red Fife, wheat	475	Bearer barley
17	Red Fife wheat	477	Laurel oat
18	Arthur pea	478	Longfellow oat
19	Cartier pea	480	Liberty oat
21	Early Blue pea	491	Brownie wheat
25	Mackay pea	520	Master wheat
26	Chancellor pea	522	Major wheat
30	Early Feed pea	561	Feeder barley
32	Champlain pea	623	Ruby wheat
37	Kubanka wheat	652	Garnet wheat
40	Early Russian wheat	670	Fenil barley
42	Eighty Day oat	675	Forage barley
44	Early Emmer	678	Legacy oat
47	Daubeney oat	709	Petite bean
49	Banner oat	710	Norwegian bean
50	Manchurian barley	711	Navy bean
51	Early Chevalier barley	712	Beauty bean
52	Longstem flax	713	Large White bean
53	Novelty flax	718	Carleton bean
54	Albert barley	728	Piper wheat
57	Duckbill barley	731	Tartan wheat
58	Stella barley	787	Diadem flax
59	Himalayan barley	928	Reward wheat
60	Chinese barley	933	Duchess wheat

PUBLICATIONS ON CEREALS

The following publications of the Department of Agriculture relating to cereals are available on application to the Publications Branch, Department of Agriculture, Ottawa:—

Wheat, Flour and Bread—Bulletin 97.

The Use of Coarse Grains for Human Food—Bulletin 40, Second Series.

Best Varieties of Grains—Pamphlet 11.

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