DOMINION OF CANADA
DEPARTMENT OF AGRICULTURE
DOMINION EXPERIMENTAL FARMS

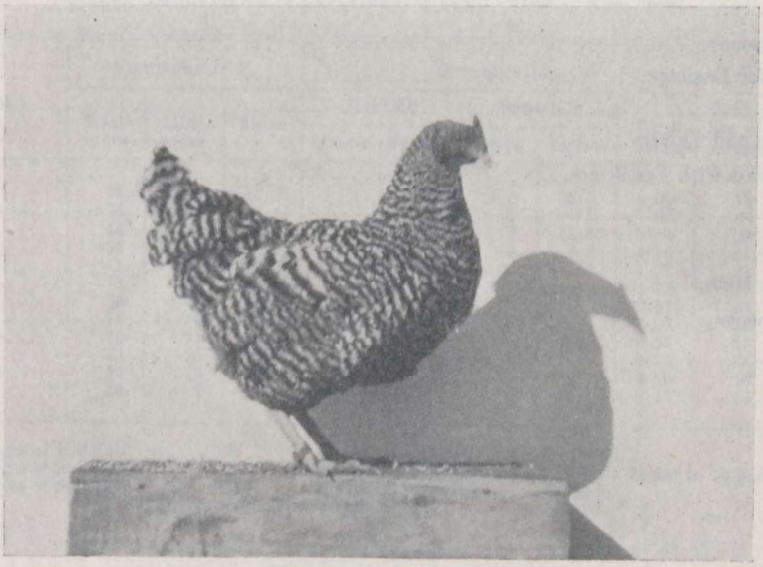
# EXPERIMENTAL STATION

## NAPPAN, N.S.

## REPORT OF THE SUPERINTENDENT

W. W. BAIRD, B.S.A.

## FOR THE YEAR 1923



BARRED ROCK No. G-25
Production 308 eggs in 365 days. Three full sisters produced 273, 272 and 224 eggs respectively in same period.

Printed by authority of the Hon .W. R. Motherwell, Minister of Agriculture, Ottawa, 1924

# TABLE OF CONTENTS

# DOMINION EXPERIMENTAL FARM, NAPPAN, N.S.

## Report of the Superintendent, W. W. Baird, B.S.A.

### SEASONAL CONDITIONS

The winter of 1922-23 was characterized by exceptionally heavy snow-storms and the steady cold weather. The snow which covered the ground from December until April protected the grass and clover and gave a bumper clover crop in 1923.

Spring opened very late and seeding was not general until May 25. June was dry and cool, and small seeds were backward in germinating. The summer was broken by wet weather, but October was very fine and warm, and harvesting was completed in good time.

Roots and grain were stored in good condition and gave bumper yields. Silage crops were below the average due to the cool weather during the growing season.

WEATHER OBSERVATIONS AT EXPERIMENTAL FARM, NAPPAN, N.S., 1923

| Month | Temperature F. | | | Precipitation | | | | | Sunshine | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Rainfall | | Snowfall | | | | |
| | Maximum | Minimum | Mean | Days | Inches | Days | Inches | Total inches | Number of days | Total hours |
| January | 48 | −26 | 12·95 | 4 | 1·22 | 8 | 38·0 | 5·02 | 18 | 89·0 |
| February | 36 | −20 | 7·44 | ..... | ..... | 5 | 10·5 | 1·05 | 26 | 154·3 |
| March | 44 | −21 | 18·76 | 2 | 0·64 | 6 | 25·0 | 3·14 | 25 | 131·7 |
| April | 56 | − 6 | 35·32 | 11 | 3·40 | 4 | 7·0 | 4·10 | 21 | 152·8 |
| May | 71 | 31 | 47·57 | 13 | 1·77 | ..... | ..... | 1·77 | 21 | 170·2 |
| June | 78 | 33 | 55·86 | 9 | 4·12 | ..... | ..... | 4·12 | 27 | 185·7 |
| July | 83 | 45 | 61·66 | 14 | 2·31 | ..... | ..... | 2·31 | 26 | 193·4 |
| August | 78 | 40 | 60·42 | 15 | 2·97 | ..... | ..... | 2·97 | 30 | 238·8 |
| September | 76 | 31 | 55·52 | 11 | 3·21 | ..... | ..... | 3·21 | 27 | 160·2 |
| October | 73 | 23 | 48·76 | 11 | 3·33 | ..... | ..... | 3·33 | 25 | 146·1 |
| November | 62 | 15 | 39·40 | 10 | 4·16 | ..... | ..... | 4·16 | 16 | 70·3 |
| December | 56 | − 2 | 29·71 | 6 | 2·50 | 5 | 19·5 | 4·45 | 13 | 51·3 |

Days of Rainfall..... 106 Inches of Rainfall..... 29·63
Days of Snowfall..... 28 Inches of Snowfall..... 100·00, equal to 10 inches rain.
Days of Sunshine..... 275 Hours of Sunshine.....1,743·8
Total precipitation, 39·63 inches.

## ANIMAL HUSBANDRY

The live stock work has made very satisfactory progress and increase during the past two years. The breeding results with Guernseys have shown marked improvement during the past season. The Shorthorns have not shown such a marked change as have the dairy breeds. The grading up work has continued to make satisfactory progress, particularly is this true in the case of the Holsteins. On January 1, 1924, there were 127 head of cattle which are used for breeding, demonstration and experimental work.

PURE-BRED BREEDING STOCK

| | | | | | | |
|---|---|---|---|---|---|---|
| Guernseys | 12 | milch cows, | 10 | heifers, | 6 | bulls |
| Shorthorns | 7 | " | 6 | " | 4 | " |

GRADE BREEDING STOCK

| | | | | | | |
|---|---|---|---|---|---|---|
| Holsteins grades | 17 | milch cows, | 16 | heifers, | 1 | bull |
| Ayrshires grades | 12 | " | 14 | " | 2 | " |

EXPERIMENTAL FEEDERS

| | |
|---|---|
| Shorthorn grades | 20 steers |

### GUERNSEYS

At the present time all Guernseys are under R.O.P. test and prospects are that many more will qualify, showing a profitable return over cost of feed. Individual records are kept of production and feed consumed. From these records the following tables are compiled: (1) The cost of milk production. (2) The cost of rearing Guernsey calves and yearlings. A number of good bulls have been sold to breeders for stock improvement. The full pedigree of the senior and junior herd bulls used at this Farm may be obtained from the report of the Experimental Farm for the year 1922.

| Name | Date of dropping calf | Age at beginning of period | Number of days in milk | Total pounds milk for period | Daily average yield of milk | Average per cent fat in milk | Pounds butter produced in period | Value of butter at 42 cents per pound | Value of skim-milk at 20 cents per cwt. | Total value of product | Amount of meal eaten at $2.05 per cwt. | Amount of roots and ensilage eaten at $3.12 per ton | Amount of hay eaten at $9.82 per ton | Amount of green feed eaten at $3.60 per ton | Months on pasture at $2 per month | Total cost of feed for period | Cost of feed to produce 100 pounds milk | Cost of feed to produce 1 pound butter, skim-milk neglected | Profit on 1 pound butter, skim-milk neglected | Profit on cow for period, labour and calf neglected |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | lbs. | lbs. | % | lbs. | $ | $ | $ | lbs. | lbs. | lbs. | lbs. | | $ | $ | $ | $ | $ |
| Cabbage Rose of Hillside—1909 | April 19, 1922 | 5 | 346 | 7,074·2 | 20·44 | 5·42 | 479·28 | 201·30 | 13·38 | 214·68 | 4,137 | 7,364 | 3,694 | 1,107 | 4 13/15 | 126·16 | 1 78 | 0 26 | 0 16 | 88 52 |
| King's Blanche of Hillside—1048 | Dec. 24, 1922 | 8 | 311 | 9,008·7 | 28·96 | 5·52 | 621·60 | 261 07 | 17 02 | 278 09 | 3,250 | 5,870 | 2,959 | 1,279 | 3 3/5 | 99 81 | 1 11 | 0 16 | 0 26 | 178 28 |
| Mixter Glamour—2123 | July 5, 1922 | ..... | 365 | 7,278·8 | 19·94 | 5·42 | 493·14 | 207 12 | 13 77 | 220 89 | 3,856 | 6,864 | 3,747 | 1,107 | 5 19/30 | 121 41 | 1 67 | 0 25 | 0 17 | 99 48 |
| Princess Daisy of Hillside—2039 | May 19, 1922 | 6 | 356 | 7,833·2 | 22·00 | 5·92 | 579·66 | 243 46 | 14 73 | 258 19 | 4,259 | 6,964 | 3,704 | 1,107 | 4 13/15 | 128 09 | 1 63 | 0 22 | 0 20 | 130 10 |
| Princess of Stannox—2120 | Aug. 8, 1922 | 6 | 381 | 5,146·0 | 13·51 | 5·23 | 336·42 | 141 30 | 9 75 | 151 05 | 3,102 | 5,990 | 3,005 | 1,515 | 6 4/5 | 104 02 | 2 02 | 0 31 | 0 11 | 47 03 |
| Patricia of Stannox—2125 | Dec. 17, 1922 | 2 | 348 | 5,921·0 | 17·01 | 5·63 | a16·69 | 175 01 | 11 18 | 186 19 | 2,197 | 4,880 | 2,865 | 1,279 | 3 3/5 | 76 22 | 1 29 | 0 18 | 0 24 | 109 97 |
| Princess Daisy L. K. of H. 2nd—2041 | Oct. 23, 1922 | 2 | 308 | 4,048·6 | 13·14 | 6·40 | 323·89 | 136 03 | 7 58 | 143 61 | 2,186 | 5,970 | 2,775 | 555 | 3 1/10 | 74 95 | 1 85 | 0 23 | 0 19 | 68 66 |
| Princess Dairymaid of L. K. 4th—2044 | Oct. 8, 1922 | 2 | 318 | 3,943·9 | 12·40 | 6·54 | 322·41 | 135 41 | 7 37 | 142 78 | 2,428 | 5,970 | 2,925 | 650 | 2 14/15 | 80 49 | 2 04 | 0 25 | 0 17 | 62 29 |
| Queen of Sherborn—2121 | Sept. 28, 1922 | 8 | 365 | 7,722·4 | 21·16 | 5·18 | 500·03 | 210 01 | 14 64 | 224 65 | 3,284 | 5,990 | 3,075 | 1,994 | 6 2/5 | 108 15 | 1 40 | 0 22 | 0 20 | 116 50 |
| Total for heard—nine cows | ..... | ..... | 3,098 | 57,976·8 | 168·56 | 51·26 | 4,073·12 | 1,710 71 | 109 42 | 1,820 13 | 28,699 | 55,862 | 28,749 | 10,593 | 41 4/5 | 919 30 | 14 79 | 2 08 | 1 70 | 900 83 |
| Average for herd—nine cows | ..... | ..... | 344 | 6,441·9 | 18·73 | 5·70 | 452·57 | 190 08 | 12 16 | 202 24 | 3,189 | 6,207 | 3,194 | 1,177 | 4·64 | 102 14 | 1 64 | 0 23 | 0 19 | 100 09 |

The following figures are taken from the preceding table. The average butter-fat test for the nine Guernsey cows just completing their lactation period was 5.7 per cent, yielding 367.19 pounds fat; the average feed cost for 100 pounds milk was $1.64; the average profit over feed cost was $100.09 per cow. The following is a financial statement for nine cows completing their year:

TO FEED COST FOR NINE COWS AND THEIR CALVES FOR ONE YEAR

| | | |
|---|---|---|
| 28,699 pounds meal at $41 per ton | $ 588 33 | |
| 55,862 pounds roots at $3.12 per ton | 87 14 | |
| 28,749 pounds hay at $9.82 per ton | 141 16 | |
| 10,593 pounds green feed at $3.60 per ton | 19 07 | |
| 41-4 5 months in pasture at $2 per month | 83 60 | |
| 12 tons straw at $3 | 36 00 | |
| Eight bull services at $5 | 40 00 | |
| Cost of feed for 8 calves up to 1 year | 354 72 | |
| | | $ 1,350 02 |
| *Credit from 9 cows—* | | |
| 4,073·12 pounds butter at 42 cents per pound | $ 1,710 17 | |
| 54,672·12 pounds skim-milk at 20 cents per cwt | 109 34 | |
| 2 heifer calves 1 year old | 300 00 | |
| 6 bulls 1 year old | 600 00 | |
| 106 tons manure from cows and calves at $1 per ton | 106 00 | |
| | | $ 2,825 51 |
| Credit balance from 9 cows | | $ 1,475 49 |

## GRADE DAIRY HERD

The grading-up of a dairy herd by the use of pure-bred sires has been continued since 1911. At the date of writing this report, the Ayrshire grade herd consists of six mature cows in milk, five three-year-olds in milk, one two-year-old in milk, seven yearling heifers, seven heifer calves and two bulls.

The Holstein herd consists of eight mature cows in milk, three three-year-olds in milk, six two-year-olds in milk, eight yearling heifer calves and one bull.

The value of using pure-bred sires has been well demonstrated in the experimental breeding test, as will be noted from the following tables of production and of comparative yields of progeny and dams at the same age. In the latter table, it will be noted that 88.9 per cent of the Ayshires and 81.8 per cent of the Holsteins were superior to their dams in production at the same age. Not only has the standard of production been raised, but a marked improvement in the standard of dairy and breed type of the grade herds has been made.

## Grade Herd Production
Cows that have completed lactation periods in 1923

| Name of cow | Date of dropping calf | Number of lactation period | Number of days in milk | Total pounds milk for period | Daily average yield of milk | Average per cent fat in milk | Pounds of butter produced in period | Value of butter at 30 cents per pound | Value of skim-milk at 20 cents per cwt. | Total value of product | Amount of meal eaten at 1¼ cents per pound | Amount of roots and ensilage eaten at $2 per ton | Amount of hay eaten at $7 per ton | Amount of green feed eaten at $3 per ton | Month on pasture at $1 per month | Total cost of feed for period | Cost of feed to produce 100 pounds milk | Cost of feed to produce 1 pound butter, skim-milk neglected | Profit on 1 pound butter, skim-milk neglected | Profit on cow for period-labour and calf neglected |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | lbs. | lbs. | % | | $ | $ | $ | lbs. | lbs. | lbs. | lbs. | | $ | $ | $ | $ | $ |
| *Ayrshires*— | | | | | | | | | | | | | | | | | | | | |
| Bell 1AS1 | April 12, 1923 | 5 | 202 | 4,513·3 | 22·3 | 4·4 | 233·63 | 70 09 | 8 63 | 78 72 | 2,224 | 5,680 | 3,011 | 1,379 | 4 1/3 | 50 42 | 1 12 | 0 22 | 0 08 | 28 30 |
| Bell 1AS12 | " 22, 1923 | 2 | 254 | 4,450·7 | 17·5 | 4·7 | 246·10 | 73 83 | 8 48 | 82 31 | 1,857 | 3,750 | 2,571 | 1,279 | 4 1/3 | 42 21 | 0 95 | 0 17 | 0 13 | 40 10 |
| Jessie 1A5 | Dec. 22, 1923 | 4 | 284 | 6,358·2 | 22·4 | 4·3 | 321·65 | 96 50 | 12 17 | 108 67 | 2,370 | 5,990 | 2,724 | 1,453 | 4 11/30 | 51 69 | 0 81 | 0 16 | 0 14 | 56 98 |
| Jessie 1A51 | Mar. 14, 1922 | 1 | 382 | 6,261·8 | 16·4 | 4·7 | 346·24 | 103 87 | 11 94 | 115 81 | 2,291 | 6,120 | 3,520 | 776 | 4 8/15 | 52 77 | 0 84 | 0 15 | 0 15 | 63 04 |
| Jessie 1A121 | " 27, 1923 | 3 | 278 | 5,331·1 | 19·2 | 4·5 | 282·23 | 84 67 | 10 18 | 94 85 | 2,175 | 5,230 | 3,059 | 1,279 | 4 1/3 | 49 38 | 0 93 | 0 17 | 0 13 | 45 47 |
| Jessie 1A122 | May 9, 1923 | 1 | 322 | 4,558·1 | 14·2 | 4·5 | 241·31 | 72 39 | 8 71 | 81 10 | 2,045 | 5,415 | 3,128 | 776 | 4 8/15 | 47 62 | 1 04 | 0 16 | 0 14 | 33 48 |
| Myrtle 1A113 | " 3, 1923 | 2 | 242 | 3,966·9 | 16·4 | 4·3 | 200·68 | 60 20 | 7 59 | 67 79 | 1,690 | 3,750 | 2,571 | 1,279 | 4 1/3 | 40 13 | 1 01 | 0 20 | 0 10 | 27 66 |
| Myrtle 1As22 | Mar. 28, 1923 | 1 | 210 | 2,518·1 | 11·9 | 4·2 | 124·42 | 37 33 | 4 83 | 42 16 | 1,195 | 1,900 | 1,553 | 1,279 | 4 1/3 | 28 52 | 1 13 | 0 23 | 0 07 | 13 64 |
| Spot 1A4 | Jan. 15, 1923 | 5 | 309 | 6,535·2 | 21·1 | 4·4 | 338·29 | 101 49 | 12 50 | 113 99 | 2,371 | 5,880 | 3,059 | 1,291 | 4 1/3 | 52 49 | 0 80 | 0 15 | 0 15 | 61 50 |
| Spot 1A42 | April 13, 1923 | 2 | 262 | 5,067·9 | 19·3 | 4·6 | 274·26 | 82 28 | 9 87 | 92 15 | 1,815 | 3,750 | 2,571 | 1,279 | 4 1/3 | 41 69 | 0 82 | 0 15 | 0 15 | 50 46 |
| *Holsteins*— | | | | | | | | | | | | | | | | | | | | |
| Bell 1H42 | April 21, 1923 | 1 | 225 | 3,112·8 | 13·8 | 4·0 | 146·48 | 43 93 | 5 97 | 49 91 | 1,222 | 1,550 | 1,646 | 1,279 | 4 1/3 | 28 84 | 0 92 | 0 19 | 0 11 | 21 07 |
| Jessie 1HS2 | " 13, 1922 | 2 | 393 | 6,673·0 | 17·0 | 4·3 | 337·58 | 101 27 | 12 77 | 114 04 | 3,017 | 7,300 | 4,579 | 776 | 4 8/15 | 66 74 | 1 00 | 0 19 | 0 11 | 47 30 |
| Myrtle 1HS2 | Mar. 12, 1923 | 3 | 280 | 6,976·8 | 24·9 | 4·0 | 328·32 | 98 49 | 13 40 | 111 89 | 2,063 | 3,780 | 2,731 | 1,279 | 4 1/3 | 45 38 | 0 65 | 0 14 | 0 16 | 66 51 |
| Myrtle 1HS3 | Feb. 23, 1923 | 2 | 282 | 4,636·6 | 16·4 | 3·7 | 201·83 | 60 55 | 8 93 | 69 48 | 2,472 | 5,480 | 3,421 | 1,279 | 4 1/3 | 54 61 | 1 16 | 0 27 | 0 03 | 14 87 |
| Myrtle 1H4 | Dec. 6, 1922 | 4 | 279 | 8,268·5 | 29·6 | 3·8 | 369·65 | 110 90 | 15 91 | 126 81 | 2,696 | 5,990 | 3,012 | 1,004 | 3 7/15 | 55 20 | 0 67 | 0 15 | 0 15 | 71 61 |
| Spot 1H2 | Aug. 3, 1922 | 5 | 486 | 6,319·5 | 13·0 | 4·1 | 304·82 | 91 45 | 12 12 | 103 57 | 2,846 | 5,920 | 3,627 | 2,055 | 7 3/5 | 65 24 | 1 03 | 0 21 | 0 09 | 38 33 |
| Spot 1H3 | April 12, 1922 | 4 | 323 | 6,020·4 | 12·7 | 3·9 | 276·23 | 82 87 | 11 57 | 94 44 | 2,392 | 6,060 | 3,578 | 776 | 4 8/15 | 54 18 | 0 90 | 0 20 | 0 10 | 40 26 |
| Spot 1H12 | May 18, 1922 | 3 | 326 | 6,959·3 | 21·3 | 3·9 | 319·30 | 95 79 | 13 37 | 109 16 | 2,477 | 5,365 | 3,029 | 776 | 4 8/15 | 52 63 | 0 75 | 0 16 | 0 14 | 56 53 |
| Spot 1H22 | April 22, 1922 | 2 | 602 | 8,242·1 | 13·7 | 4·0 | 387·86 | 116 36 | 15 82 | 132 18 | 3,579 | 8,140 | 5,573 | 2,055 | 8 13/15 | 84 33 | 1 02 | 0 22 | 0 08 | 47 85 |
| Spot 1H32 | " 19, 1922 | 1 | 364 | 5,914·6 | 16·2 | 4·1 | 285·29 | 85 58 | 11 35 | 96 93 | 2,320 | 5,545 | 3,182 | 776 | 4 8/15 | 51 38 | 0 86 | 0 18 | 0 12 | 45 55 |
| Vera 1H4 | " 14, 1922 | 3 | 351 | 8,138·6 | 23·2 | 4·2 | 402·14 | 120 64 | 15 60 | 136 24 | 2,762 | 5,805 | 3,434 | 776 | 4 8/15 | 58 05 | 0 71 | 0 14 | 0 16 | 78 19 |
| Vera 1H22 | " 6, 1922 | 2 | 404 | 8,410·0 | 20·8 | 3·9 | 385·77 | 115 73 | 16 16 | 131 89 | 3,078 | 7,460 | 4,234 | 776 | 4 8/15 | 66 45 | 0 79 | 0 17 | 0 13 | 65 44 |

COMPARISON OF PROGENY AND DAMS AT SAME AGE

| | Ayrshires | | Holsteins | |
|---|---|---|---|---|
| | Dam | Progeny | Dam | Progeny |
| Number of cows | 9 | 9 | 11 | 11 |
| Lactation period | ..... | 1923 | ..... | 1923 |
| Average days in milk | 280·4 | 293·7 | 290·0 | 363·0 |
| Pounds of milk | 4,546·6 | 5,006·4 | 5,085·3 | 6,610·3 |
| Daily average pounds | 16·21 | 17·05 | 17·53 | 18·21 |
| Average test per cent | 4·42 | 4·47 | 3·45 | 4·0 |
| Pounds of fat | 201·13 | 224·28 | 183·02 | 257·01 |
| Feed cost $ | 51 98 | 45 17 | 57 35 | 57 31 |
| Profit over feed $ | 27 69 | 43 59 | 16 96 | 48 82 |
| Average increase in milk over dams in pounds | ..... | 459·8 | ..... | 1,525·0 |
| Per cent increase in milk over dams in pounds | ..... | 10·11 | ..... | 30·0 |
| Average increase in fat pounds | ..... | 23·15 | ..... | 73·99 |
| Per cent increase in fat | ..... | 11·5 | ..... | 44·14 |
| Increase in profit $ | ..... | 15 90 | ..... | 31 86 |
| Per cent progeny superior to dam | ..... | 88·9 | ..... | 81·8 |

From the preceding table it may be noted that the progeny showed an increase over dams in their average daily production also in the average per cent fat. It is also of interest to note that 88.9 per cent of the Ayrshire and 81.8 per cent of the Holstein progeny were superior to dams.

## BEEF CATTLE—SHORTHORNS

The Shorthorn herd has not been increased, owing to shortage of stable room. The herd consists of seven mature cows, four two-year-old heifers, two heifer calves and three bull calves. The market price of beef cattle has been very low compared with the cost of raising and finishing. Therefore, the profits realized have not been a stimulus to the beef industry. The object in maintaining a herd of beef cattle at this Farm is on account of this being a beef raising centre. Therefore, it is considered expedient to collect data on cost of maintaining a beef herd and cost of rearing and finishing of beef calves under present day conditions. All calves have been allowed to suckle their dams. Individual records are kept of feed consumed and in this way the actual cost of maintaining the herd is obtained. Cost of rearing calves is also being kept. These records certainly do not show that much profit can be obtained from beef at present day prices when reared in this way. A cheaper method of raising the calves must be followed if reasonable returns are to be expected. The following tables contain the data collected for 1923 on cost of maintaining the beef cows; also cost of rearing calves and yearlings for all breeds:—

COSTS FOR FEED AND CARE OF COWS AND HEIFERS

| | Guernsey heifers cost of rearing from one year to date of dropping first calf. | Shorthorn cows cost of feed for one year |
|---|---|---|
| Number of animals | 3 | 9 |
| Average number of days fed | 568 | 365 |
| Pounds skim-milk | 940 | ..... |
| Pounds meal | 6,461 | 18,376 |
| Pounds roots and ensilage | 15,034 | 45,535 |
| Pounds hay | 9,871 | 32,707 |
| Pounds green feed | 586 | 7,740 |
| Months on pasture | 18½ | 8·26 |
| Total cost $ | 219 54 | 658 80 |
| Average cost $ | 73 18 | 73 20 |
| Prices used— | | |
| Skim-milk per cwt. $ | 20 | ..... |
| Meal per cwt. $ | 1 94 | 2 18 |
| Roots and ensilage per ton $ | 2 95 | 2 95 |
| Hay per ton $ | 9 82 | 9 82 |
| Green feed per ton $ | 3 60 | 3 60 |
| Pasture per month $ | 1 00 | 2 00 |

COST OF RAISING CALVES—DIFFERENT BREEDS

| | Guernseys | | Grades | Shorthorns | |
|---|---|---|---|---|---|
| | Bulls | Heifers | Heifers | Bulls | Heifers |
| Number of animals | 6 | 2 | 8 | 4 | 4 |
| Average number days fed | 287 | 365 | 365 | 606 | 365 |
| Pounds whole milk consumed | 7,933 | 2,674 | 6,616 | ..... | ..... |
| Pounds skim-milk consumed | 20,149 | 6,406 | 25,527 | ..... | ..... |
| Pounds meal consumed | 2,649 | 1,415 | 6,192 | 7,888 | 3,185 |
| Pounds roots and silage | 2,664 | 595 | 6,981 | 16,596 | 4,336 |
| Pounds hay | 5,196 | 2,370 | 10,202 | 13,706 | 5,763 |
| Pounds green feed | ..... | 395 | 2,368 | 1,538 | 837 |
| Feed cost of cows when suckled | ..... | ..... | ..... | 288 95 | 298 67 |
| Total cost $ | 285 85 | 96 49 | 324 07 | 545 99 | 394 75 |
| Average cost $ | 47 64 | 48 25 | 40 50 | 136 49 | 98 69 |
| Feed prices— | | | | | |
| Whole milk per cwt. $ | ..... | 1 64 | 1 39 | ..... | ..... |
| Skim-milk per cwt. $ | ..... | 20 | 20 | ..... | 20 |
| Meal per cwt. $ | ..... | 1 88 | 1 88 | ..... | 2 06 |
| Roots and silage per ton $ | ..... | 2 95 | 2 95 | ..... | 2 95 |
| Green feed per ton $ | ..... | 3 60 | 3 60 | ..... | 3 60 |
| Hay per ton $ | ..... | 9 82 | 9 82 | ..... | 9 82 |

Feeds were charged at cost or cost of production.

## EXPERIMENTAL FEEDING WORK

### TURNIPS, CORN ENSILAGE AND SUNFLOWER ENSILAGE

To determine the relative feeding value of these three succulents a test was conducted during the winter of 1922-23. Nine cows were used in this test. They were divided into three groups and fed three twenty-one-day periods. The hay and meal rations were kept constant for all groups. The turnips, corn ensilage and sunflower ensilage were interchanged every twenty-one days.

| Number cows | Period 1 | Period 2 | Period 3 |
|---|---|---|---|
| (Group 1) 3 | Turnips | Corn silage | Sunflower silage. |
| (Group 2) 3 | Sunflower silage | Turnips | Corn silage. |
| (Group 3) 3 | Corn silage | Sunflower silage | Turnips. |

As there is a possibility of the first part of each period being influenced by the preceding feeding, only the last seven days' production of each period is used as a basis of comparison.

The following table gives the results obtained from the nine cows for the last seven days of each period, with the feed cost per hundredweight of milk produced:—

COMPARISON OF ENSILAGES AND ROOTS

| — | | Turnips | Corn silage | Sunflower silage |
|---|---|---|---|---|
| Number of cows in test | | 9 | 9 | 9 |
| Pounds milk produced | | 1,208·7 | 1,073·6 | 1,122·2 |
| Average milk per cow per day in pounds | | 19·19 | 17·04 | 17·81 |
| Total pounds meal consumed | | 567 | 567 | 567 |
| Total pounds hay consumed | | 882 | 882 | 882 |
| Total pounds silage or roots | | 1,890·0 | 1,890·0 | 1,890·0 |
| Pounds silage or roots consumed per 100 pounds milk produced | | 156·37 | 176·04 | 169·31 |
| Cost of meal mixture fed | $ | 11 62 | 11 62 | 11 62 |
| Value of silage and roots | $ | 3 09 | 2 81 | 2 49 |
| Value of other roughage fed (hay) | $ | 4 33 | 4 33 | 4 33 |
| Total cost of feed | $ | 19 04 | 18 76 | 18 44 |
| Total cost to produce 100 pounds milk | $ | 1 58 | 1 75 | 1 64 |

*Feed Cost—*
Meal, per ton, $41.
Hay, per ton, $9.82.
Roots, per ton, $3.27.
Corn, per ton, $2.97.
Sunflowers, per ton, $2.63.

The following is a summary giving the daily average production for all cows for each of the seven days for the three feeding periods:—

| Number of cows—11 | Turnips | Corn ensilage | Sunflower ensilage |
|---|---|---|---|
| | lbs. | lbs. | lbs. |
| Daily average 1st 7 days | 20·05 | 18·15 | 18·12 |
| Daily average 2nd 7 days | 19·18 | 17·70 | 18·09 |
| Daily average 3rd 7 days | 19·19 | 17·04 | 17·81 |

The preceding figures indicate that the best results were obtained from turnips, with sunflowers second, and corn third. The difference in the average daily production of the last seven days for corn and sunflowers is not sufficient to warrant any deductions to be drawn, particularly from one year's results and so few cows. The turnips show quite an increase over either corn or sunflowers and even at a higher cost per ton show the cheapest milk production per hundred pounds.

DEHORNING

Eighteen yearlings and twenty steers were weighed and dehorned on April 13, 1923, and November 17, 1923, respectively. The following data give the average weights of each before dehorning and at intervals of two and three weeks after dehorning:—

| | lbs. |
|---|---|
| Average weight before dehorning, 11 yearlings | 582·0 |
| Average weight in two weeks of 11 yearlings | 571·0 |
| Average weight in three weeks of 11 yearlings | 585·0 |
| Average gain in three weeks after dehorning of 11 yearlings | 3·0 |
| Average weight before dehorning of 20 steers | 1,012·0 |
| Average weight in two weeks of 20 steers | 1,029·4 |
| Average gain in two weeks of 20 steers | 16·6 |

The yearlings showed a slight decrease in weight the first two weeks but made an average daily gain of 0·78 pounds during the third week. In case of the twenty steers they made an average daily gain of 0.83 pounds during the first two weeks after dehorning. Any loss that may be realized from dehorning will be more than made up during the feeding period.

## SWINE

The two breeding herds maintained at this Farm consist of twelve Yorkshires and three Berkshire sows. The Yorkshires are headed by Dolphington Max (Imp.), bred by A. V. Dudgeon, Aberdeenshire, Scotland, and imported in 1923 by the Director of Experimental Farms. He is of good bacon type and his first get show excellent quality and growthiness, together with the length and depth of side desired. The Berkshire herd is headed by Prince Augustus No. 60616. This boar is of excellent type and his stock shows up well; however, the demand for Berkshires is decreasing.

The year 1923 was a poor one for swine breeders, the price dropping to the lowest level known for some time. In spite of this our cost of production experiments show a substantial profit. Fortunately the market prospects for 1924 look brighter than for the past twelve months. Thirteen Yorkshire sows dropped twenty-one litters during the year of 1923 with an average of 10·7 pigs per litter and 8·6 pigs raised. Five Berkshire sows dropped nine litters averaging eight pigs per litter and 5.56 pigs raised. A number of young registered stock were supplied to breeders in the three provinces during the year and the rest were either sold as feeders or kept for experimental work. The following tables give a summarized financial statement of the thirteen Yorkshire and five Berkshire sows bred:—

FINANCIAL STATEMENT OF BROOD SOWS

| Average pounds meal per day | Average total cost of feed per sow for 1 year | Average number of pigs per litter | Average number raised | Average per cent raised | Average cost at 6 weeks | Average value of litter at 6 weeks |
|---|---|---|---|---|---|---|
| | $ | | | | $ | $ |
| 13 Yorkshires—5·8 | 35 67 | 10·7 | 8·6 | 80·8 | 2 56 | 54 19 |
| 5 Berkshires—5·5 | 35 23 | 8·0 | 5·56 | 69·4 | 3 52 | 33 78 |

| —— | Thirteen Yorkshires | Five Berkshires |
|---|---|---|
| | $ | $ |
| Average value per pig at six weeks | 6 29 | 6 08 |
| Average profit per pig over cost of feed | 3 73 | 2 56 |
| Average profit per sow over cost of feed | 51 87 | 25 57 |
| Total profit over feed cost from sows | 674 31 | 127 83 |

Feeds were charged at cost or cost to produce prices as follows: Meal, $33.46; skim milk, $4; roots, $3.15 per ton, and pasture 50 cents per month.

FINANCIAL STATEMENT OF FEEDS FOR THE SWINE HERD FOR THE YEAR 1923

Eighteen Brood Sows, One Boar and Progeny

*Feed Cost*

| | | |
|---|---|---|
| To 63,943 pounds meal at $1.64 per cwt | $1,048 67 | |
| 53,315 pounds skim-milk at 20 cents per cwt | 106 63 | |
| 17,320 pounds roots at $3.15 per ton | 27 28 | |
| 16,000 pounds straw at $4 per ton | 32 00 | |
| Pasture, 19 head, 3 months at 50 cents per month | 28 50 | |
| | | $ 1,243 08 |

*Credit*

| | | |
|---|---|---|
| By sale of 53 carcasses pork— | | |
| 414 pounds dressed at 13 cents | $ 53 82 | |
| 1,367 pounds dressed at 12 cents | 164 04 | |
| 3,028 pounds dressed at 15 cents | 454 20 | |
| 549 pounds dressed at 14 cents | 76 86 | |
| 446 pounds dressed at 10 cents | 44 60 | |
| 1,130 pounds live weight at 9 cents | 101 70 | |
| 325 pounds live weight at 10½ cents | 34 13 | |
| 1,401 pounds live weight at 8 cents | 112 08 | |
| 1,206 pounds live weight at 5·4 cents | 65 12 | |
| Increase of 6 brood sows at $25 | 150 00 | |
| Sale of 14 registered sows and boars at $10 | 140 00 | |
| Sale of 71 non-registered sows and boars at $6.05 | 429 55 | |
| Sale of 10 non-registered sows and boars at $8 | 80 00 | |
| Young feeders on hand, 62 at $6 | 372 00 | |
| 36 tons manure at $1 | 36 00 | |
| | | 2,314 10 |
| Profit over feed cost for year | | $ 1,071 02 |

*Feed Cost of Raising Pigs to Six Weeks of Age and of Producing Pork*

*Feed Cost of Young Pigs at Six Weeks*

| | | |
|---|---|---|
| To feed for 18 sows, average yearly cost of feed $36.10 | $ 649 80 | |
| 30 boar services at $1 | 30 00 | |
| 4 tons straw at $4 | 16 00 | |
| | | $ 695 80 |
| By 18 tons manure at $1 | | 18 00 |
| Total feed cost of 231 pigs at 6 weeks | | $ 677 80 |
| Total feed cost of 1 pig at 6 weeks | | 2 93 |

*Feed Cost to Produce One Pound Pork*

| | | |
|---|---|---|
| To cost of 46 pigs at 6 weeks at $2.93 | $ 134 78 | |
| Feed for 46 pigs until beginning of feeding test | 13 96 | |
| Feed for 46 pigs for 162 days on test | 457 81 | |
| 3 tons straw at $4 | 12 00 | |
| | | $ 618 55 |
| By 5 tons manure at $1 | | 5 00 |
| Total feed cost to produce 6,629 pounds pork | | $ 613 55 |
| Total feed cost to produce 100 pounds pork | | 9 26 |
| Total feed cost to produce 1 pound pork | | 0·093 |

NOTE.—The range in price for light pork was from 12 to 15 cents or an average for the year of 13 cents. If pork can be raised at a feed cost of 9·26 cents and sold at an average price of 13 cents, the producer not only receives market price for his home grown feeds but has a fair margin for wages and interest. This should be considered a profitable branch to carry on in combination with dairying.

## BARLEY VERSUS CORN AND GREEN FEED VERSUS NO GREEN FEED IN THE FINISING RATION

Two lots of four pigs each were carried in this experiment. The rations used were as follows: From beginning of period until twenty weeks of age, equal parts of oats, shorts and corn (or barley). After twenty weeks, one part each of oats and shorts and two parts of corn (or barley); 8 per cent fish meal was used the latter part of the test. In table No. 1, lots Nos. 1 and 2 show the results obtained from barley versus corn in the finishing ration. Lots Nos. 3 and 4 show the results obtained from green feed versus no green feed.

TABLE No. 1—FINISHING RATION FOR PIGS

| —— | Corn Lot 1 | Barley Lot 2 | Green feed Lot 3 | No green feed Lot 4 |
|---|---|---|---|---|
| Hogs in test | 4 | 4 | 5 | 5 |
| Initial weight, gross, pounds | 306·0 | 323·0 | 109·0 | 113·0 |
| Initial average weight, gross, pounds | 76·5 | 80·8 | 21·8 | 22·6 |
| Days on test | 86 | 86 | 156 | 156 |
| Finished weight, gross, pounds | 724·0 | 677·0 | 899·0 | 882·0 |
| Finished weight, average, gross, pounds | 181·0 | 169·3 | 176·4 | 179·8 |
| Total gain for period, pounds | 418·0 | 354·0 | 790·0 | 769·0 |
| Average gain per hog, per period, pounds | 104·5 | 88·5 | 158·0 | 153·8 |
| Average daily gain, per hog, pounds | 1·215 | 1·03 | 1·01 | 0·986 |
| Pounds meal eaten per period | 1,084·0 | 1,084·0 | 2,782·5 | 2,782·5 |
| Pounds skim-milk eaten per period | 1,184·0 | 1,184·0 | 1,865·0 | 1,865·0 |
| Pounds green feed eaten per period | 376·0 | 376·0 | 680·0 | ..... |
| Pounds meal eaten per pound gain | 2·59 | 3·06 | 3·52 | 3·62 |
| Pounds skim-milk eaten per pound gain | 2·83 | 3·34 | 2·36 | 2·43 |
| Pounds green feed eaten per pound gain | 0·9 | 1·06 | 0·86 | ..... |
| Total cost of feed $ | 23·42 | 21·15 | 52·80 | 51·60 |
| Cost of feed per head $ | 5·86 | 5·29 | 10·56 | 10·32 |
| Cost of feed per head per day cts. | 6·81 | 6·15 | 6·77 | 6·61 |
| Cost of feed per pound gain per head " | 5·6 | 5·99 | 6·68 | 6·58 |
| Average dressing percentage | 66·9 | 65·8 | 76·08 | 77·22 |
| Prices used— | | | | |
| Meal, per cwt. $ | 1·88 | 1·67 | 1·72 | 1·72 |
| Skim-milk, per cwt. cts. | 20 | 20 | 20 | 20 |
| Green feed, per ton $ | 3·60 | 3·60 | 3·60 | ..... |

In table No. 2, lots Nos. 1 and 2 show the data collected on cost of pork production of summer-fed versus winter-fed shoats. Lots Nos. 3 and 4 show a comparison of Berkshire and Yorkshire crosses.

TABLE No. 2—COST OF FEEDING CROSS-BREDS AND SUMMER VS. WINTER FEEDING

| —— | Summer-fed Lot 1 | Winter-fed Lot 2 | Berk sire York dam Lot 3 | York sire Berk dam Lot 4 |
|---|---|---|---|---|
| Hogs in test | 18 | 28 | 4 | 4 |
| Initial weight, gross, pounds | 851·0 | 966·0 | 320·0 | 309·0 |
| Initial average weight, gross, pounds | 47·3 | 34·5 | 80·0 | 77·3 |
| Days on test | 125 | 186 | 86 | 86 |
| Finished weight, gross, pounds | 3,182·0 | 5,753·0 | 702·0 | 699·0 |
| Finished weight, average, gross, pounds | 176·8 | 205·5 | 80·0 | 77·3 |
| Total gain for period, pounds | 2,331·0 | 4,787·0 | 382·0 | 390·0 |
| Average gain per hog, for period, pounds | 129·5 | 171·0 | 95·5 | 97·5 |
| Average daily gain, per hog, pounds | 1·04 | 0·92 | 1·11 | 1·13 |
| Pounds meal eaten for period | 7,733·0 | 15,351·0 | 1,084·0 | 1,084·0 |
| Pounds skim-milk eaten for period | 6,098·0 | 16,900·0 | 1,184·0 | 1,184·0 |
| Pounds green feed eaten for period | 1,432·0 | 10,500·0 | 376·0 | 376·0 |
| Pounds meal eaten per pound gain | 3·32 | 3·62 | 2·83 | 2·78 |
| Pounds skim-milk eaten per pound gain | 2·62 | 3·53 | 3·0 | 3·04 |
| Pounds green feed eaten per pound gain | 0·614 | 2·19 | 0·98 | 0·96 |
| Total cost of feed $ | 148·94 | 308·86 | 22·29 | 22·29 |
| Cost of feed per head $ | 8·27 | 11·03 | 5·57 | 5·57 |
| Cost of feed per head per day cts. | 6·62 | 5·93 | 6·48 | 6·48 |
| Cost of feed per pound gain " | 6·39 | 6·45 | 5·83 | 5·72 |
| Dressing percentage | 72·1 | 76·1 | 66·9 | 65·8 |
| Prices used— | | | | |
| Meal, per cwt. $ | 1·735 | 1·68 | 1·775 | 1·775 |
| Skim-milk, per cwt. cts. | 20 | 20 | 20 | 20 |
| Green feed, per ton $ | 3·60 | ..... | 3·60 | 3·60 |
| Roots, per ton $ | ..... | 3·27 | ..... | ..... |

The cost per hundred pounds of pork was somewhat lower for the summer-fed lot although the meal mixture fed cost slightly more, and their average daily gain was better. In comparing lots Nos. 3 and 4, one will note that there was very little difference either in the daily gain or cost per pound gain. The pigs in group No. 1 were a nicer type of bacon hog, having a little more length than the pigs in group No. 2.

YORKSHIRES VERSUS BERKSHIRES—SUMMER VERSUS WINTER FEEDING

Table No. 3 shows the data collected on feeding Yorkshires versus Berkshires. Lots Nos. 1 and 2 were summer fed and lots Nos. 3 and 4 were winter fed. The Yorkshires made slightly better gains during both summer and winter feeding periods and the cost per pound gain was less than for the Berkshires.

TABLE NO. 3—SUMMER AND WINTER FEEDING WITH YORKSHIRES AND BERKSHIRES

| | Summer feeding | | Winter feeding | |
|---|---|---|---|---|
| | Lot 1 Yorkshire | Lot 2 Berkshire | Lot 3 Yorkshire | Lot 4 Berkshire |
| Hogs in test | 5 | 5 | 14 | 14 |
| Initial weight, gross, pounds | 123·0 | 99·0 | 486·0 | 480·0 |
| Initial average weight, gross, pounds | 24·6 | 19·8 | 34·7 | 34·0 |
| Days on test | 156 | 156 | 178 | 194 |
| Finished weight, gross, pounds | 1,021·0 | 760·0 | 3,055·0 | 2,698·0 |
| Finished weight, average, gross, pounds | 204·2 | 152·0 | 218·2 | 192·7 |
| Total gain for period, pounds | 898·0 | 661·0 | 2,569·0 | 2,218·0 |
| Average gain per hog, for period, pounds | 179·6 | 132·2 | 183·5 | 158·4 |
| Average daily gain, per hog, pounds | 1·15 | 0·847 | 1·03 | 0·818 |
| Pounds meal eaten for period | 2,782·5 | 2,782·5 | 7,857·0 | 7,494·0 |
| Pounds skim-milk eaten for period | 1,865·0 | 1,865·0 | 7,095·0 | 9,805·0 |
| Pounds green feed, roots, eaten per period | 272·0 | 408·0 | 5,250·0 | 5,250·0 |
| Pounds meal eaten per pound gain | 3·1 | 4·21 | 3·04 | 3·38 |
| Pounds skim-milk eaten per pound gain | 2·08 | 2·81 | 2·76 | 4·42 |
| Pounds green feed, eaten per pound gain | 0·303 | 0·62 | 2·04 | 2·36 |
| Total cost of feed $ | 52·08 | 52·32 | 154·77 | 154·09 |
| Cost of feed per head $ | 10·42 | 10·46 | 11·05 | 11·00 |
| Cost of feed per head per day cts. | 6·68 | 6·71 | 6·21 | 5·68 |
| Cost of feed per pound gain " | 5·8 | 7·92 | 6·02 | 6·95 |
| Dressing percentage | 77·2 | 76·1 | 75·5 | 76·7 |
| Prices used— | | | | |
| Meal, per cwt $ | 1·72 | 1·72 | 1·68 | 1·68 |
| Milk, per cwt cts. | 20 | 20 | 20 | 20 |
| Green feed, per ton $ | 3·60 | 3·60 | ..... | ..... |
| Roots, per ton $ | ..... | ..... | 3·27 | 3·27 |

## SHEEP

The flock on this Farm formerly consisted of a pure-bred and a grade flock of Shropshires. A heavy culling was made during 1923 owing to shortage of housing and pasture room. The grades were disposed of and the pure-bred flock cut down to fifteen ewes, two shear and over; seven shearlings; eight ewe lambs; and one ram lamb. This flock is headed by the imported ram Buttar 332/38074=. This ram is of exceptionally good breeding; is large, typy and gives indication of being an outstanding breeding sire. His wool clip in 1923 was 15 pounds. He was bred by Thomas A. Buttar, Corstan, Coupar-Angus, Forfarshire, Scotland, and was imported by the Director of Experimental Farms in 1923. During the season of 1923 the twenty-four ewes dropped twenty-eight lambs, raising twenty-six or 109 per cent.

FINANCIAL STATEMENT OF FEEDS FOR THE PURE-BRED FLOCK OF SHROPSHIRES, CONSISTING OF TWENTY-FOUR EWES, TEN YEARLINGS AND ONE RAM

| | | |
|---|---|---|
| *Dr.* | | |
| To feed for 24 ewes and ram— | | |
| 3,095 pounds meal at $1.77 per cwt | $ 54 78 | |
| 2,231 pounds roots at $3.27 per ton | 3 65 | |
| 3,700 pounds hay at $9.82 per ton | 18 17 | |
| 3,426 days pasture at 2 cents per day | 68 52 | |
| | | $ 145 12 |
| To feed for 10 yearlings— | | |
| 867 pounds meal at $1.77 per cwt | $ 15 35 | |
| 714 pounds roots at $3.27 per ton | 1 17 | |
| 1,445 pounds hay a $9.82 per ton | 7 09 | |
| 1,725 days pasture at 2 cents per day | 34 50 | |
| | | 58 11 |
| To feed for 26 lambs— | | |
| 1,061 pounds meal at $1.77 per cwt | $ 18 78 | |
| 1,048 pounds roots at $3.27 per ton | 1 71 | |
| 304 pounds hay at $9.82 per ton | 1 49 | |
| 4,027 days pasture at 1 cent per day | 40 27 | |
| | | 62 25 |
| | | $ 265 48 |
| *Cr.* | | |
| By Sale of 277 pounds wool at 34·7 cents per pound | $ 96 12 | |
| Sale of 4 pure-bred rams at $20 | 80 00 | |
| Sale of 49 pounds mutton at 10 cents | 4 90 | |
| Sale of 45 pounds lamb at 20 cents | 9 00 | |
| Sale of 1,749 pounds lambs and cull sheep at 4¼ cents, live weight | 74 33 | |
| Sale of 10 sheep skins at $1 | 10 00 | |
| Increase stock, 8 ewes and 1 ram at $20 | 180 00 | |
| 36 tons manure at $1 | 36 00 | |
| | | $ 490 35 |
| Profit over feed cost | | $ 224 87 |
| Total cost of feeds for 35 sheep for 1923 | $ 203 23 | |
| Total cost of feeds for 1 sheep for 1923 | 5 81 | |
| Total cost to raise pure-bred lambs— | | |
| To Feed cost for 24 ewes and ram 365 days | 145 12 | |
| Feed cost for 26 lambs for 365 days | 68 25 | |
| | | $ 213 37 |
| *Less*— | | |
| 277 pounds wool at 34·7 cents per pound | $ 96 12 | |
| 36 tons manure at $1 per ton | 36 00 | |
| | | 132 12 |
| Total feed cost for 26 lambs | | $ 81 25 |
| Total feed cost for 1 lamb | | 3·125 |

## THE GRADE FLOCK

In 1917 a grading experiment was started, using foundation ewes of Leicester and Shropshire crosses. These were bred to a pure-bred Shropshire ram, the offsprings culled, and the best selected for each succeeding year's breeding. The results were entirely satisfactory. The quantity and quality of the wool clip was raised; the size, growthiness and quality of the lambs were increased; and by 1923 the flock had all the appearances of pure-bred Shropshires. At the Maritime Winter Fair, the following winnings were made: first for five grade lambs, alive and dressed; second and fourth in grade wether class; first in grade ewe class; first for group of three wethers. The classes were all well filled, there being from six to fifteen entries in each. The group of five were outstanding in uniformity and finish. The grade ewes were all disposed of in 1923, except for two ewe lambs. This was done to make room for increase in the pure-bred flock.

The wool clip in 1917 was 6·25 pounds per fleece. In 1920 the average was 8·45 pounds, in 1921 it increased to 8·72 pounds, while in 1922 it averaged 8·16. These figures, together with the show ring results, indicate the value of a pure-bred sire and the increased profits which may result from its use. Sheep-raising is a branch of the live stock industry which deserves more attention than it is receiving at the present time. That lambs can be raised profitably is shown in this report and has been shown in the preceding reports from this Farm.

FINANCIAL STATEMENT OF FEEDS FOR GRADE FLOCK FOR 1923 CONSISTING OF TWENTY-ONE GRADE EWES, ELEVEN YEARLINGS AND ONE RAM

| | | |
|---|---|---|
| *Dr.* | | |
| To feed for 21 grade ewes and ram for 239 days— | | |
| 2,152 pounds meal at $1.77 per cwt. | $ 38 09 | |
| 701 pounds roots at $3.27 per ton | 1 15 | |
| 1,984 pounds hay at $9.82 per ton | 9 74 | |
| 2,991 days pasture at 2 cents per day | 59 82 | |
| | | $ 108 80 |
| To feed for 11 yearlings for 239 days— | | |
| 540 pounds meal at $1.77 per cwt. | $ 9 56 | |
| 872 pounds hay at $9.82 per ton | 4 28 | |
| 1,216 days pasture at 2 cents per day | 24 32 | |
| | | 38 16 |
| To feed for 24 lambs— | | |
| 308 pounds meal at $1.77 per cwt. | $ 5 45 | |
| 688 pounds roots at $3.27 per ton | 1 12 | |
| 148 pounds hay at $9.82 per ton | 73 | |
| 2,814 days pasture at 1 cent per day | 28 14 | |
| | | 35 44 |
| | | $ 182 40 |
| *Cr.* | | |
| By Sale of 208 pounds wool at 34·7 cents per pound | $ 72 18 | |
| Sale of 60 pounds mutton at 10 cents | 6 00 | |
| Sale of 58 pounds lamb at 16 cents | 9 28 | |
| Sale of 2,792 pounds lamb at 4¼ cents, live weight | 118 66 | |
| Sale of 180 pounds lamb at 20 cents per pound | 36 00 | |
| Sale of 227 pounds lamb at 14 cents per pound | 31 78 | |
| Sale of 8 sheep skins at $1 | 8 00 | |
| Sale of 32 pounds lamb at 15 cents | 4 80 | |
| Increase stock, 2 ewes at $10 | 20 00 | |
| 25 tons manure at $1 | 25 00 | |
| | | 331 70 |
| Profit over feed cost | | $ 149 30 |
| Feed cost of rearing grade lambs to 7 months of age— | | |
| Total cost of feed for 21 ewes and ram for 239 days | $ 108 80 | |
| Total cost of feed for 24 lambs | 35·44 | |
| | | 144 24 |
| *Less*— | | |
| 208 pounds wool at 34·7 cents | $ 72 18 | |
| 25 tons manure at $1 | 25 00 | |
| | | 97 18 |
| Total feed cost of 24 lambs to 7 months | | $ 47 06 |
| Total feed cost of 1 lamb to 7 months | | 1 96 |

## HORSES

The stable at this Farm consists of three Clydesdale mares, two Clydesdale stallions, one six-year-old Clydesdale gelding, one two-year-old Clydesdale filly, two Clydesdale colts, four grade Clydesdale mares, three grade geldings, one grade two-year-old filly, one express mare and one driver. The stable is headed by Baron Begg—20119—. He is a stallion of great quality, but lacks somewhat in size. His get are showing up well. Homestead Pansy foaled a fine filly in 1923, sired by Baron Begg, and Baron's Fancy foaled a colt sired by the same stallion. Both show good quality and growthiness and should make a good addition to the stable.

Ploughing with Clydesdales at the Experimental Farm, Nappan, N.S.

## FIELD HUSBANDRY

The spring of 1923 was very late in opening, and the ground being cold, field work was nearly all crowded into the month of June. Seeding did not start until May 25 and field work in general until June 4. After the middle of June, the ground warmed up somewhat and the weather, although cool, proved ideal for hay and grain crops. The former gave a bumper crop with a large percentage of clover and was harvested in good condition. The lateness of the fall and exceptionally fine weather in October enabled the grain to be harvested in good condition and good yields were obtained. Oats, peas, and vetch mixture was a good crop, but corn did not mature sufficiently to make number one silage, while the sunflower crop was below the average. Roots were excellent, although late in starting, but the late fall more than made up for this, and a good acre yield was obtained.

### ROTATION OF CROPS

The main rotation conducted on this Farm is a four-year one and is giving excellent results. The ground holds the moisture longer during spells of drought and drains more quickly after a heavy rain, besides giving a more uniform crop year after year than the fields not under a definite rotation. A rotation experiment as outlined in the report for 1922 is being conducted, but no definite results can be obtained until the remainder of the land is under-drained.

### COST OF PRODUCTION OF FIELD CROPS

The following tables give the cost of production of the field crops produced in 1923. The cost of applying manure includes the time for hauling from the yard to the field and spreading. Owing to the depth of snow during the winter, the frost did not loosen up the soil to any extent, and three ploughings were necessary to provide a good seed bed for turnips.

COST TO PRODUCE OATS, 1923
Second Crop in Four-year Rotation

Area—1 acre.

| | | |
|---|---|---|
| Rent of land | $ | 4 00 |
| Use of machinery | | 3 00 |
| Manure, 5 tons at $1 | | 5 00 |
| Spreading manure, 4·3 hours, 2 horses at 56 cents | | 2 41 |
| Spreading manure, 1·1 hours, 1 man at 28 cents | | 0 31 |
| Ploughing, 4·5 hours, 3 horses at 68 cents | | 3 06 |
| Harrowing, disc and smoothing, tractor, 2·5 hours at $1 | | 2 50 |
| Seeding, 1·2 hours, 2 horses at 56 cents | | 0 67 |
| Reaping, 1·6 hours, 3 horses at 68 cents | | 1 09 |
| Stooking, 2·13 hours, 1 man at 28 cents | | 0 60 |
| Twine, 2·5 pounds at 15 cents | | 0 38 |
| Restooking and turning out, 2·8 hours, 1 man at 28 cents | | 0 78 |
| Hauling grain to barn, 1·4 hours, 2 horses at 56 cents | | 0 78 |
| Hauling grain to barn, 3·4 hours, 1 man at 28 cents | | 0 95 |
| Threshing, 63 bushels at 10 cents | | 6 30 |
| Seed, 3 bushels at $1 per bushel | | 3 00 |
| Total cost per acre | $ | 34 83 |
| Less straw, 2,389 pounds at $4 per ton | | 4 78 |
| Cost of grain | $ | 30 05 |

Yield per acre, 63 bushels.
Cost of grain per acre, $30.05.
Cost per bushel, 47·7 cents.

COST TO PRODUCE CORN ENSILAGE, 1923
First Crop in Four-year Rotation

Area—1 acre.

| | | |
|---|---|---|
| Rent of land | $ | 4 00 |
| Use of machinery | | 3 00 |
| Manure, 5 tons at $1 | | 5 00 |
| Spreading manure, 4·3 hours, 2 horses at 56 cents | | 2 41 |
| Spreading manure, 1·1 hours, 1 man at 28 cents | | 0 31 |
| First ploughing, 3·9 hours, tractor, at $1 | | 3 90 |
| Second ploughing, 3·3 hours, tractor, at $1 | | 3 30 |
| Harrowing, double disc and smoothing, tractor, 3·6 hours at $1 | | 3 60 |
| Drill seeding, 1 hour, 2 horses at 56 cents | | 0 56 |
| Cultivating, 3 times, 3·75 hours, 2 horses at 56 cents | | 2 10 |
| Cultivating, 2·5 hours, 1 horse at 44 cents | | 1 10 |
| Hoeing, 12 hours, 1 man at 28 cents | | 3 36 |
| Cutting, 3 hours, 2 horses at 56 cents | | 1 68 |
| Hauling to silo, 8·4 hours, 2 horses at 56 cents | | 4 70 |
| Hauling to silo, 4·2 hours, 1 man at 28 cents | | 1 18 |
| Cutting into ensilage, 6·5 hours, 4 men at 28 cents | | 7 28 |
| Gasoline used in tractor, 6·5 gallons at 33 cents | | 2 15 |
| Seed, 25 pounds at 4½ cents | | 1 13 |
| Total cost per acre | $ | 50 76 |

Yield per acre, 12·2 tons.
Cost per acre, $50.76.
Cost per ton, $4.16.

COST TO PRODUCE TURNIPS, 1923
First Crop in Four-year Rotation

Area—1 acre.

| | | |
|---|---|---|
| Rent of land | $ | 4 00 |
| Use of machinery | | 3 00 |
| Manure, 5 tons at $1 | | 5 00 |
| Spreading manure, 4·3 hours, 2 horses at 56 cents | | 2 41 |
| Spreading manure, 1·1 hours, 1 man at 28 cents | | 0 31 |
| First ploughing, 3·9 hours, tractor, at $1 | | 3 90 |
| Second and third ploughings, 6·6 hours, tractor, at $1 | | 6 60 |
| Harrowing, double disc and smoothing, 3·6 hours, tractor, at $1 | | 3 60 |
| Seeding, 2·5 hours, 1 horse at 44 cents | | 1 10 |
| Cultivating, 4·6 hours, 1 horse at 44 cents | | 2 02 |
| Cultivating, 1·3 hours, 2 horses at 56 cents | | 0 73 |
| Hoeing, 40·6 hours, 1 man at 28 cents | | 11 37 |
| Pulling, 22·5 hours, 1 man at 28 cents | | 6 30 |
| Hauling to cellar, 22·3 hours, 1 horse at 44 cents | | 9 81 |
| Loading and storing, 20·2 hours at 28 cents | | 5 66 |
| Total cost per acre | $ | 65 81 |

Yield per acre, 893·4 bushels or 22·34 tons.
Cost per acre, $65.81.
Cost per bushel, $0.074.
Cost per ton, $2.95.

COST TO PRODUCE O.P.V. ENSILAGE, 1923
First Crop in Four-year Rotation

| | | |
|---|---|---|
| Area—1 acre. | | |
| Rent of land | $ | 4 00 |
| Use of machinery | | 3 00 |
| Manure, 5 tons at $1 | | 5 00 |
| Spreading manure, 4·3 hours, 2 horses at 56 cents | | 2 41 |
| Spreading manure, 1·1 hours, 1 man at 28 cents | | 0 31 |
| Ploughing, 4·5 hours, 3 horses at 68 cents | | 3 06 |
| Harrowing, disc and smoothing, tractor, 3·6 hours at $1 | | 3 60 |
| Seeding, 1·2 hours, 2 horses at 56 cents | | 0 67 |
| Cutting, 2·4 hours, 2 horses at 56 cents | | 1 34 |
| Hauling to barn, 3·5 hours, 2 horses at 56 cents | | 1 96 |
| Hauling to barn, 6 hours, 1 man at 28 cents | | 1 68 |
| Cutting into ensilage, 3·5 hours, 4 men at 28 cents | | 0 98 |
| Gasoline used in tractor, 3·5 gallons at 33 cents | | 1 16 |
| Seed—Oats, 1¼ bushels at 64 cents; Peas, 1 bushel at $3; Vetch, ½ bushel at $4.75 | | 6 50 |
| Total cost per acre | $ | 35 67 |

Yield per acre, 9·95 tons.
Cost per acre, $35.67.
Cost per ton, $3.58.

COST TO PRODUCE HAY, 1923

| | | |
|---|---|---|
| Area—1 acre. | | |
| Rent of land | $ | 4 00 |
| Use of machinery | | 3 00 |
| Seed—10 pounds timothy at 10¼ cents; 8 pounds red clover at 23 cents; 2 pounds alsike at 17 cents; $3.26 (half) | | 1 63 |
| Manure, 5 tons at $1 | | 5 00 |
| Spreading manure, 4·3 hours, 2 horses at 56 cents | | 2 41 |
| Spreading manure, 1·1 hours, 1 man at 28 cents | | 0 31 |
| Mowing, 1·21 hours, 2 horses at 56 cents | | 0 68 |
| Tedding hay, 0·66 hours, 2 horses at 56 cents | | 0 37 |
| Raking hay, 1·1 hours, 1 horse at 44 cents | | 0 48 |
| Coiling hay, 1.69 hours, 1 man at 28 cents | | 0 47 |
| Shaking out, loading and storing, 13 hours, 1 man at 28 cents | | 3 64 |
| Hauling to barn, 2·9 hours, 2 horses at 56 cents | | 1 62 |
| Total cost per acre | $ | 23 61 |

Yield per acre, 2·65 tons.
Cost per acre, $23.61.
Cost per ton, $8.91.

From data collected along the same lines as for oats, in 1923 wheat cost $26.66 per acre, or $1.23 per bushel; barley cost $27.48 per acre, or 71·2 cents per bushel; mixed grain cost $29.13 per acre, or 58 cents per bushel. Items of cost for sunflowers were similar to those for corn, and the yield was 15·23 tons per acre at a cost of $54.80, or $3.60 per ton.

## CULTURAL EXPERIMENTS, 1923

Two hundred and thirty cultural plots of one-fortieth acre each were laid off in 1922. It will be three to four years before any data of value can be published from these plots, therefore just an outline of the cultural work being conducted is given in this report as follows: Experiment No. 1—Preparation of sod land for grain; Experiment No. 2—After-harvest cultivation of sunflower ground for grain; Experiment No. 3—Depth of ploughing sod for grain; Experiment No. 4—Preparation of sod for roots; Experiment No. 5—Rates of seeding nurse crops of oats; Experiment No. 6—Preparation of sod land for sunflowers; Experiment No. 7—Barn yard manure (time and rate of application); Experiment No. 8—Application of fertilizer to hay land; Experiment No. 9—Seed bed preparation; Experiment No. 10—Green manure experiment.

### TOP-DRESSING HAY LAND

In the spring of 1921, the five-acre field D2 was equally divided and one-half was top-dressed with 20 tons manure per acre. The second half received no treatment. The results for the succeeding three years are here given:—

| | Yield per acre |
|---|---|
| **1921** | |
| Top-dressed | 2 tons 520 lbs. |
| No top-dressing | 2 " 180 " |
| **1922** | |
| Top-dressed | 2 tons 1,360 lbs. |
| No top-dressing | 2 " 672 " |
| **1923** | |
| Top-dressed | 3 tons 100 lbs. |
| No top-dressing | 2 " 630 " |

We note from the above that the variation between the yields on the two fields is becoming greater each year. As 1923 was a banner year for hay, a good yield was obtained from the non-treated area as well as from the top-dressed.

### LIMESTONE VERSUS SLAG FOR HAY LAND

This experiment was started in 1920 on field B4. The field was divided into three equal plots of five and one-third acres each. The whole field was top-dressed with 12 tons manure per acre. Plot No. 1 received 2½ tons limestone per acre and plot No. 3 received 1,200 pounds slag, while No. 2 had no additional treatment. The results for the four years are as follows:—

LIMESTONE AND SLAG ON HAY LAND

| Treatment | Yields per acre | | | |
|---|---|---|---|---|
| | 1920 Grain and straw | 1921 Hay | 1922 Hay | 1923 Hay |
| | tons | tons | tons | tons |
| Limestone, 2·5 tons | 1·09 | 0·91 | 2·13 | 2·81 |
| Check | 1·37 | 0·85 | 2·08 | 2·03 |
| Slag, 1,200 pounds | 1·18 | 0·99 | 2·13 | 2·13 |

From a careful analysis of the preceding table the following points may be noted: (*a*) The variation in yields obtained from the three plots are so slight that no definite deductions may be made. (*b*) There is some indication that the check plot is decreasing in its production each year.

### RENEWING MARSH LAND, 1923

The experiment started in 1922 in the renewing and reditching of run-out marsh was continued in 1923. The object in view is to determine the cost per acre of the above work and to demonstrate its value in increased yields. A thirteen-acre block was ploughed, partly in the fall of 1922 and the rest in the following spring. This marsh, while in a very bad condition with high ditch banks and filled-in ditches, was not as hard to level as the block renewed in 1922. The hay yield on this land in 1923 was 2·16 tons per acre, while the 62

acres of old marsh averaged 1·37 tons. The following is the cost of various operations in connection with renewing the 13-acre block in 1923:—

| | | |
|---|---|---|
| *Ditching and levelling ditch banks—* | | |
| Manual labour, 1,227 hours at 28 cents | $ 343 56 | |
| Horse labour, 110 hours at 12 cents | 13 20 | |
| | | $ 356 76 |
| *Preparing sod, fertilizing and seeding—* | | |
| 2 horses, 1 man, 209 hours at 56 cents | $ 117 04 | |
| Harrowing, tractor, 37 hours at $1 | 37 00 | |
| Grass seed—130 pounds timothy at 13¾ cents; 78 pounds red clover at 23 cents; 52 pounds alsike at 17 cents | 44 66 | |
| 39 bushels seed oats at $1 | 39 00 | |
| | | 237 70 |
| *Slag applied—* | | |
| 5 tons at $22 per ton | | 110 00 |
| Total cost | | $ 704 46 |
| Cost per acre | | 54 19 |
| Total yield— | | |
| 536 bushels oats at 64 cents | | $ 343 04 |
| 22·9 tons straw at $4 | | 91 60 |
| Total returns | | $ 434 64 |
| Returns per acre | | 33 43 |

The above statement shows that the cost of ditching and levelling the ditch banks was $27.44 per acre: the application of $7.70 basic slag per acre cost $8.46 per acre. Breaking the old sod, applying the slag and reseeding the land with grass and clover using oats as a nurse crop cost $15.28 per acre.

FINANCIAL STATEMENT OF MARSH RENEWING BLOCK RENEWED IN 1922

| | *Cr* | *Dr.* |
|---|---|---|
| 1922—Expenses for ditching and levelling, preparing sod for seeding and fertilizers applied | | $ 637 00 |
| 1922—Returns 307 bushels grain at 65 cents | $ 199 55 | |
| Straw, 9·59 tons at $3 | 28 77 | |
| 1923—Returns 20·06 tons hay at $8.91 | 178 73 | |
| Balance due on renewing | 229 95 | |
| | $ 637 00 | $ 637 00 |

LIME ON MARSH LAND

| Plot No. | Treatment | Yield per acre | |
|---|---|---|---|
| | | Oats, 1922 | Hay, 1923 |
| | | bush. | tons |
| 1 | ½ ton slag, 18 per cent $P_2O_5$ | 33·9 | 2·19 |
| 2 | Checks, no treatment | 25·3 | 1·92 |
| 3 | 1½ tons limestone | 29·5 | 2·32 |
| 4 | 2½ tons limestone | 31·7 | 2·43 |
| 5 | Check, no treatment | 22·6 | 2·04 |
| 6 | ½ ton slag, 18 per cent $P_2O_5$ | 26·8 | 2·25 |
| 7 | 1,400 pounds wood ashes | 25·8 | 1·97 |

The yields obtained show an increase over check plot both in the case of slag and ground limestone but the increase is barely sufficient to cover the cost of material and application of same. More beneficial results may be obtained in the succeeding years.

## DIFFERENT DATES OF SEEDING SUNFLOWERS

The experiment started in 1921 to determine the relative advantage of early and late seedings of sunflowers was continued and the results are given below with a three year average. This shows the highest yields from the later sowings, due no doubt to the extra moisture in the more immature plants. Feeding experiments have shown that this makes a better feed than does the more mature cutting.

DATES OF SEEDING SUNFLOWERS

| Date of seeding | Height | Stage of maturity when cut | Yield per acre | | Three-year average yield per acre | |
|---|---|---|---|---|---|---|
| | inches | | tons | lbs. | tons | lbs. |
| June 2 | 100 | 100 per cent in bloom.... 25 per cent soft dough. | 30 | 1,800 | 27 | ..... |
| June 11 | 100 | 100 per cent in bloom.... | 22 | 600 | 24 | 493 |
| June 16 | 104 | 90 per cent in bloom.... | 31 | 1,800 | 28 | 1,106 |
| June 23 | 99 | 50 per cent in bloom.... | 30 | 1,800 | 30 | 1,200 |

NOTE.—The low yields obtained from the sowing of June 11 cannot be accounted for. The soil was uniform and all sowings were of the same variety and received the same treatment. Field notes indicate that the stalks of that sowing were finer throughout the whole season.

### DISTANCE APART FOR SOWING SUNFLOWERS

This experiment was started in 1921 to determine the relative merits of narrow and wide rows. The following table shows the results obtained in 1923 and also a three year average:—

DISTANCES APART FOR SOWING SUNFLOWERS

| Distance | Height | Stage of maturity when cut | Yield per acre | | Three-year average yield per acre | |
|---|---|---|---|---|---|---|
| Feet | inches | | tons | lbs. | tons | lbs. |
| 2½ | 114 | 100 per cent bloom..... 25 per cent soft dough. | 25 | 600 | 22 | 333 |
| 3 | 110 | 100 per cent bloom..... 25 per cent soft dough. | 30 | 400 | 24 | 66 |
| 3½ | 112 | 100 per cent bloom..... 25 per cent soft dough. | 24 | 200 | 22 | 1,800 |

### OATS, PEAS AND VETCH FOR GREEN FEED AND ENSILAGE

Two acres of O.P.V. on B2 in the four-year rotation, gave a total yield of 11 tons 910 pounds. This crop was cut early for green feed because of mustard infestation, hence the low yield. One acre of O.P.V. on the side-hill orchard was ensiled, yielding 9 tons 1,890 pounds. Another field, four-fifths of an acre, near the barn, which was cut for green feed when the oats were in the milk stage, yielded 12 tons 60 pounds per acre.

### ROOTS

Six acres on B2 were seeded to turnips, approximately two acres to Monarch seed and four to club-root-resistant seed, obtained from Charlottetown. The total yield from the six acres was 5,316·2 bushels. The Monarch variety averaged 839.4 bushels per acre, and the club-root-resistant averaged 922.5 bushels. The yield of Monarch was cut down by club-root infection, being nearly 50 per cent club-rooted while the club-root-resistant was 2 per cent affected.

### MIXED GRAIN

Eight acres were sown on B1 with a mixture of 1¾ bushels oats, three-quarters bushels barley and one-half bushel wheat. The total yield was 394 bushels or an average per acre of 49·3 bushels. Four acres on another field gave an average yield of 51.8 bushels per acre. This makes a splendid feed mixture for dairy cows, sheep or swine.

## HORTICULTURE

The drifts of snow that piled up over the apple trees, fruit bushes and ornamental shrubs during the winter of 1922-23 did much damage. In some instances the trees or bushes were broken down beyond repair. The fields were not bare until the last week in April. In sheltered spots, snow could be observed as late as May 24. The season opened late and remained cool throughout May and June. The first planting in the garden was on May 25, but the soil was still cold and sad. These conditions were not conducive to rapid germination. From a horticultural point of view the season was poor.

The apple trees grew well and the fruit setting was good but it was undersized, ripened unevenly and was poorly coloured. The dull, showery weather during the last of July washed off the spray mixtures and this, along with the dull, muggy weather, was conducive to the development of fungous diseases.

The heavy wind and rain storm that passed over this section on October 1 contributed its share to the damage of fruit and ornamental trees, some of which were torn out by the roots and approximately 30 to 40 per cent of the fruit blown off.

The season was very free from killing frosts. The latest spring frost was recorded on May 12 of 2 degrees. The earliest fall frost was on October 3 of 1 degree with a killing frost recorded on October 28 of 9 degrees.

All vegetables except cabbage were below the average, the weather being too cold, wet and dull for good growth.

Plant diseases such as strawberry rust, anthracnose, mosaic, leaf-roll, powdery mildew and apple scab were all prevalent.

### TREE FRUITS

#### OLD ORCHARD

Sod is left on either side of the trees and the intervening space was sown partly to buckwheat and partly to oats, peas and vetches. The fruit was below average both in size and quality, and some varieties were infected with scab. The heavy wind and rain storm of October 1 blew off approximately 30 to 40 per cent of the crop.

Much of this fruit was undeveloped and therefore of no commercial value, but the result was a low yield recorded. Three sprayings were made during the season with a mixture of 1½ gallons lime sulphur, 2½ pounds arsenate of lime to 50 gallons water. The three sprayings controlled the insect pests but were not sufficient to control scab. The frequent showers washed off much of the spray mixtures and this, along with the dull weather, was conducive to the development of scab. The following varieties tested in this orchard since 1892 may be recommended for northern Nova Scotia: Alexander, Baxter, Bellflower, Charlamoff, Dudley, Duchess, Fameuse, Golden Russet, Grimes Golden, Jonathan, McIntosh Red, Red Astrachan, St. Lawrence, Wagener, Wealthy and Yellow Transparent.

#### COMMERCIAL ORCHARD

The commercial orchard was badly damaged during the winter from the heavy drifts of snow which covered one section entirely. A few trees were completely destroyed, while others required severe pruning and many grafts in order to develop uniform trees. This orchard undoubtedly received a serious set back. Clean cultivation is practised in this orchard during the growing season. The following series of cover crops were sown on August 8, 1923: common red clover, white or dutch, alsike, sweet clover, hubam, vetch and rape. As the orchard is made up of fifteen varieties of one row each running north

and south, the cover crops were sown east and west. In this way the effect of the different varieties may be noted from each cover crop. The following is a financial statement of the operations during the season:—

COMMERCIAL ORCHARD—COST OF PRODUCTION

| | | |
|---|---|---|
| Grafting, 5 hours at 32 cents | | $ 1 60 |
| Pruning, 25 hours at 32 cents | | 8 00 |
| Gathering limbs, 5 hours at 32 cents | | 1 60 |
| Gathering limbs, 2 horses, 5 hours at 56 cents | | 2 80 |
| Bolting split limbs, 8 hours at 32 cents | | 2 56 |
| Sowing sodium nitrate, 4 hours at 32 cents | | 1 28 |
| Harrowing, tractor, 5 hours at $1 | | 5 00 |
| Spraying, 2 horses, 2½ hours at 56 cents | | 1 40 |
| Spraying, 2 horses, 2½ hours at 56 cents | | 1 40 |
| Harrowing, tractor, 15 hours at $1 | | 15 00 |
| Digging around trees, 40 hours at 32 cents | | 12 80 |
| Harrowing, tractor, 7 hours at $1 | | 7 00 |
| Sowing cover crop, 2 horses, 4 hours at 56 cents | | 2 24 |
| Cost of seed for cover crop | | 12 83 |
| Cost of fertilizer, 300 pounds at 3·5 cents | | 10 50 |
| Cost of spraying material— | | |
| 32 pounds copper sulphate at 8 cents | $ 2 56 | |
| 32 pounds lime at 1 cent | 0 32 | |
| 16 pounds arsenate of lime at 20 cents | 3 20 | |
| | | 6 08 |
| Picking fruit, 55 hours at 32 cents | | 17 60 |
| 45 barrels at 25 cents | | 11 25 |
| Total cost | | $ 120 91 |
| By 45 barrels apples at $2.75 | | 123 75 |
| To profit | | $ 2 84 |

## SMALL FRUITS

### VARIETY TEST OF STRAWBERRIES

Fifty-nine varieties were tested in 1923. The soil was medium clay loam. This land received an application of 20 tons per acre barnyard manure in 1921 for sunflowers. Shortly after the sunflower crop was harvested, the field was ploughed and ribbed up in the late fall. The ribbing exposes a greater surface to the action of the rain, frost and sunshine which, this year, proved to be very beneficial. The soil dried out more quickly in the spring and a good seed bed was obtained. The varieties were set out on May 27, 1922, in two rows 36 inches apart and 33 feet in length. The plants were eight to ten inches apart in the rows. The runners were allowed to cover the space between the rows and one foot on each side. The area of the plot when properly matted was one-two hundred and sixty-fourth of an acre. The nine highest yielding varieties for 1923 were Ste. Antoine de Padua, Cassandra, Kellog Prize, New Globe, Lavinia, Virgilia, Senator Dunlap, Bisel and Francesca. The yields ranged from 16,203 pounds per acre to 12,309 pounds for the preceding varieties respectively.

Twenty-seven varieties have been tested for twelve years. The following is a list of same with the average yield per acre: John Little, 8,094 pounds; Michel Early, 7,557 pounds; Seedling No. 12, 7,500 pounds; Haverland, 7,497 pounds; Ste. Antoine de Padua, 7,273 pounds; Seedling No. 15, 6,700 pounds; G. H. Coughill, 6,265 pounds; Bisel, 6,243 pounds; Capt. Jack, 6,154 pounds; Crescent, 6,148 pounds; Equinox, 5,863 pounds; Bederwood, 5,805 pounds; Jeanne D'Arc, 5,777 pounds; Swindle, 5,691 pounds; Gandy, 5,505 pounds; Bartons, 5,363 pounds; Beverly, 5,327 pounds; Thompson Late, 5,281 pounds; Nick Ohmer, 5,259 pounds; Glen Mary, 5,044 pounds; Cole Seedling, 4,819 pounds; Ida, 4,540 pounds; Joe, 4,478 pounds; Enhance, 4,041 pounds; Success, 3,909 pounds; Bomba, 3,772 pounds; and William Belt, 3,755 pounds.

### BLACK CURRANTS

Ten varieties were tested in 1923. The bushes came through the winter in good condition. The fruit was of good size and of excellent quality but ripened very unevenly. This was largely due to the cold season and lack of sunshine.

The variety Kerry gave the best results with a yield of 14,327.5 pounds per acre followed by Magnus, Eagle, Topsy and Saunders. The first picking was on August 7, when the variety Boskoop Giant was matured sufficiently.

### RED CURRANTS

Five varieties were tested this year. The heavy snowfall of 1922-23 damaged many of the more slender bushes. The currant worm was bad during the leafing season. They were first sprayed with a D.E.F. mixture but this was not effective. The second spray was with a mixture of 1 pound powdered arsenate and 3 ounces nicotine sulphate mixed with 20 gallons water. This killed the worms but they had done considerable damage before the last spray was applied. Fay Prolific, Wilder and Cherry gave the best yields but all were relatively low. The first picking was on August 7 when the varieties Fay Prolific, Cherry and London Market were matured sufficiently.

### RASPBERRIES

The raspberry plantation with the exception of two varieties, Newman No. 20 and Herbert, was completely broken down by snow. It was necessary to cut all canes back to within eight or ten inches of the ground. This permitted a more uniform growth and allowed the young canes to come on more quickly. By fall a good strong growth was recorded. The varieties being tested are Newman No. 20, Newman No. 23, King, St. Regis, Columbian, Herbert, Cuthbert, King, Hebner, Loudon, Count, and Snyder, which is a variety of blackberry.

## VEGETABLE VARIETIES

### GARDEN BEANS

Eighteen varieties of beans were tested in 1923. These were planted June 5 in rows thirty inches apart and thirty-three feet long. The size of the plots was one four hundred and fortieth of an acre. The six leading varieties were Hodson Long Pod (Ottawa 2748), Plentiful French (Ottawa 2824), Refugee (Ottawa 1631), Masterpiece (Ottawa 2746), Bountiful Green Bush (Ottawa 2825), and Davis White Wax. Plentiful French was 75 per cent affected with rust.

### GARDEN PEAS

Fourteen varieties were tested in 1923. They were planted May 26 in thirty-three foot plots. The vines made very rapid growth and gave promise of a heavy yield but a severe wind storm on August 22 unrooted many plants with the result that approximately 15 to 20 per cent of the pods did not mature. A cross-bred variety, McLean Advancer and Gregory Surprise (Ottawa 2336), gave the best results, yielding 360 bushels per acre, with Gradus (Ottawa 2348) and American Wonder (Ottawa 2332) ranking second and third respectively.

### BEETS

Eight varieties or strains of garden beets were planted on May 25 in plots of one-four hundred and fortieth of an acre. The order of yields were Detroit, Dark Red, Cardinal Globe, Black Red Ball, Detroit Dark Red (Ottawa 2009), Eclipse, Detroit Dark Red, Early Model, Crosby Egyptian. Detroit Dark Red, Black Red Ball and Eclipse were all medium in size, globular in shape and of good quality. Cardinal Globe is large, globular in shape and of medium quality. Crosby Egyptian is flat, large and of medium quality. Detroit Dark Red was the earliest maturing beet.

### GARDEN CARROTS

Six varieties of carrots were tested this year. The seed was sown May 25 in rows thirty inches apart and thirty-three feet long, germination was uniform and fair growth made until the middle of July, when the carrot rust fly became very bad. The varieties according to yield were as follows: Chantenay (McDonald), Chantenay (Ottawa 3011), Half Long Scarlet, Danvers Half Long (Lethbridge), Danvers Half Long (Rennie), Market Garden. The highest yield was 205 bushels 20 pounds, while the lowest was 58 bushels 40 pounds.

### CELERY

Fourteen varieties were started under glass April 14. Four of these namely White Plume, Golden Self Blanching, Paris Golden Yellow and Giant Pascal failed to germinate. No good reasons can be given for this as all varieties received the same treatment. The remaining ten varieties were pricked off April 23 and transplanted to the open on May 15 in trenches which were prepared as follows: The rows were opened with a double mould-board plough and four inches well-rotted barnyard manure packed in the bottom of the trench, the manure was then covered with three inches of earth in which the young plants were set out. All varieties made vigorous growth and exceptionally fine heads developed. Easy Blanching, Rose Ribbed Golden, Self Blanching, New Emperor, and Rose Ribbed Paris gave the best yields. New Emperor was of poor quality.

### CORN

Ten varieties were grown in 1923. All were planted May 28 in rows thirty-three feet in length and three feet apart. Germination was strong and fairly uniform with all except Country Gentleman, which has in previous years given satisfactory results. While it germinated fairly well, it did not make a satisfactory growth either in the variety test plot or in the cultural plots, under the same treatments as all other varieties. The season was late and cool, therefore none of the varieties produced many ears that matured sufficiently for table use.

### CABBAGE

Thirteen varieties of cabbage were tested in 1923. These were started under glass April 16, transplanted to the open May 28, in rows thirty-three feet long and four feet apart. The plants were sprayed for the cabbage worm the middle of July with 1 pound dry arsenate in 20 gallons water, and dusted in September with pyrethrum powder, 1 pound to 4 pounds common flour. Both the spraying and dusting had the effect desired. The four heaviest yielders were Copenhagen Market, New Flat Swedish, Succession and Danish Ballhead.

### TOMATOES

Nineteen varieties were grown in 1923. The seed was started in the hot beds on April 17 and these were pricked off into individual pots May 10 and transplanted to the open on June 16. The plants were placed four feet apart in the row with five feet between each row. All received an application of fertilizer made up of 3 parts acid phosphate, 2 parts sodium nitrate, 1 part muriate of potash. Good results were obtained, all varieties making rapid growth of foliage. All varieties were pruned back 25 per cent on August 1, but owing to the coolness of the season and lack of sunshine, very little ripe fruit was picked. Alacrity No. 1 (Ottawa 3031), Sparks Earliana, Alacrity No. 2 (Ottawa 3033), and Danish Export yielded a small percentage of ripe fruit while the best yielders of green fruit were Alacrity No. 1, First of All, Fifty Days, Alacrity No. 2 and Sparks Earliana respectively.

### LETTUCE

Thirteen varieties were sown in the open on May 25 with the exception of Tom Thumb and All Seasons. All varieties made strong vigorous growth, giving an abundance of cuttings until late in the fall. Black Seeded Simpson (Dreer) and Black Seeded Simpson (Vaughan) had a curly, loose leaf of good quality. All Heart had a curly loose leaf of fair quality while Grand Rapids (Burpee) had a loose smooth leaf of good quality. New York Market had a crinkle leaf of medium quality. All Season had a crinkle leaf of poor quality.

### SQUASH

Four varieties of two hills each were planted on June 7. Very slow growth was made until the latter part of July. From that date all varieties made strong, vigorous growth, developing an abundance of bloom, but owing to the lateness of the season a large number did not mature. The varieties listed in order of production are: Kitchenette, Golden Hubbard (Ottawa 2910), Golden Hubbard (McDonald), and Green Hubbard.

### CUCUMBERS

Four varieties were grown this year and although it was an unfavourable season, fair results were obtained. Germination was slow and uneven. Four beds were planted of each variety on June 6. The beds were two feet by four feet and six feet apart, in rows eight feet apart. These beds were spaded out to the depth of twelve inches and well-rotted barnyard manure tramped in the bottom. This in turn was covered with from two and one-half to three inches of loam and the seeds planted. The following varieties gave good yields: Rennie XXX Table, White Spine and Improved Long Green.

### PUMPKINS

Three varieties were grown, namely King of the Mammoth, Large Cheese and Small Sugar. They were planted June 7. There was 100 per cent germination but all made slow growth for the first six or seven weeks, with the result that killing frosts came when not more than from 70 to 80 per cent were matured. King of the Mammoth and Large Cheese were the two best yielders, but Small Sugar excelled them in quality.

### ONIONS

Nine varieties or strains were sown in the hot-beds April 14 and transplanted to the open May 26. All made vigorous growth during the summer which resulted in a large percentage of thick necks. This is accounted for in a measure by lack of heat and sunshine. The three strains of Danvers Yellow Globe gave the highest yield but were not as good in quality as Early White Barletta, Giant Yellow Prizetaker or Large Red Wethersfield (Ottawa 1930).

### POTATOES

Twenty-six varieties were tested in duplicate plots of 1/100 of an acre each. The previous crop was strawberries and the land was ploughed soon after the picking season was over and ribbed up in late fall. The soil was a heavy clay loam and with the damp and cold season was not suitable for potatoes. Consequently the yields were much below the average for plot work. The five highest

yields per acre for 1923 were obtained from the following varieties: Arran Chief 265, King Edward 265, Early Six Weeks 220·8, Factor 220·7, and British Queen 220 bushels. The average production for the past seven years is given for nine of the leading varieties tested during that period as follows: British Queen 412·6, Arran Chief 395·9, Pioneer 376·7, Factor 350·3, Rawlings Kidney 349·4, Rochester Rose 336·9, Green Mountain 330·5, Irish Cobbler 321, and Carman No. 1 307·2 bushels. The first four varieties were imported from England in 1916, and for the first four or five years did not succumb to leaf roll or mosaic but retained a heavy green foliage until late in the season. Both Arran Chief and British Queen are potatoes of excellent quality, equal to if not superior to Irish Cobbler or Green Mountain as a table potato.

#### CAULIFLOWERS

Two varieties only were grown, namely Extra Early Dwarf Erfurt and Early Snowball. These were started in hot-beds on April 21 and were pricked off May 2 and transplanted to the open on May 28. These were all protected with tar paper discs which proved satisfactory as no evidence of root maggot was noticed. Early Snowball gave a larger yield and was much lower in percentage of buttonhead, showing only 30 per cent, whereas Early Erfurt was slightly over 50 per cent.

## CULTURAL TESTS WITH VEGETABLES

#### CABBAGE

*Control of Root Maggot.*—Two varieties were used in this test and the following methods applied to each: Tar paper versus no tar paper. The root maggot was not in evidence during the entire year, therefore the results were all positive.

*Different Dates of Planting* (Hot-bed versus open seeding).—Two varieties were planted in the open on May 27 and again on June 3. The same two varieties were started in the hot-bed on April 16 and planted in the open on May 27. Twenty-five plants were used in this test. The season was late, consequently only two plantings were made in the open. All varieties were harvested October 27. The early planting in hot-bed and transplanting to the open gave a marked increase over both varieties planted in the open.

#### CELERY

*Methods of Blanching.*—Easy Blanching was the variety used in this test, methods as follows:—

No. 1. One row 15 feet long, plants 6 inches apart grown on the level and earthed up.
No. 2. Grown the same as No. 1 but blanched with roofing paper.
No. 3. Two rows 15 feet long, plants six inches apart and alternated in rows, blanched with roofing paper.
No. 4. Single row, plants 6 inches apart in trench and earthed up gradually.
No. 5. Single row plants on the level 6 inches apart and blanched with boards.
No. 6. Single row plants 6 inches apart and blanched with tiles.

Where boards were used the celery grew just as well and was cleaner than any of the other methods used, but was injured by frost in the fall. The single trench, earthed up, gave the best results.

*Sprouting Test.*—A test was started this year to ascertain the value of sprouting potatoes versus not sprouting before planting. Two varieties were used, namely Irish Cobbler for the early crop and Davies Warrior for the main crop. One lot of each was exposed to subdued light for six weeks at a temperature of from 40 to 50 degrees Fahrenheit. The second lot of each was kept dormant and the third lot of each was planted from the general bin. The following table gives the comparative yields:—

| Variety | Method | Total yield per acre | |
|---|---|---|---|
| | | bush. | lbs. |
| Irish Cobbler | Exposed-subdued light | 378 | 24 |
| Davies Warrior | Exposed-subdued light | 357 | 28 |
| Irish Cobbler | General bin | 360 | 48 |
| Davies Warrior | General bin | 484 | .. |
| Irish Cobbler | Kept dormant | 422 | 20 |
| Davies Warrior | Kept dormant | 526 | 48 |
| Irish Cobbler | General bin | 379 | 28 |
| Davies Warrior | General bin | 431 | 12 |
| Irish Cobbler, Irish Cobbler | General comparison | 268 | 24 |
| Davies Warrior, Davies Warrior | General comparison | 407 | 32 |

Date of planting—June 7, 1923.
Date of harvesting—October 30, 1923.

*Different Dates of Planting.*—Two varieties were used in this test namely Irish Cobbler and Davies Warrior. Four plantings were made the first date of planting being June 7 and the last on June 27. The following table gives the yields obtained:—

DATES OF PLANTING POTATOES

| Variety | Date of planting | Per cent germination | Date of harvesting | Weight of plot | Yield per acre | |
|---|---|---|---|---|---|---|
| | | | | | Marketable | Unmarketable |
| | | | | lbs. | bush. lb. | bush. lb. |
| Irish Cobbler | June 7 | 100 | Oct. 30 | 76 | 334 24 | 26 24 |
| " " | " 15 | 100 | " 30 | 56 | 246 24 | 44 .. |
| " " | " 20 | 100 | " 30 | 44 | 193 36 | 26 12 |
| " " | " 27 | 75 | " 30 | 34 | 149 36 | 17 36 |
| Davies Warrior | " 7 | 100 | " 30 | 102 | 448 48 | 26 24 |
| " " | " 15 | 80 | " 30 | 98 | 431 12 | 17 12 |
| " " | " 20 | 60 | " 30 | 70 | 308 0 | 44 .. |
| " " | " 27 | 60 | " 30 | 64 | 281 36 | 61 36 |

*Cost of Growing Potatoes.*—A record of the time spent on the various cultural operations in growing potatoes was kept and is given below in an itemized statement of cost and production:—

COST OF GROWING POTATOES

| | | |
|---|---|---|
| Rent of land, 1 acre | | $ 4 00 |
| Use of machinery | | 3 00 |
| Manure, 8 tons at $1 | | 8 00 |
| Ploughing, 3 horses and driver, 5 hours at 68 cents | | 3 40 |
| Harrowing, twice, disc and smooth, tractor, 5 hours at $1 | | 5 00 |
| Fertilizer, 150 pounds nitrate of soda at $70 per ton | | 5 25 |
| Seed, 20 bushels at $1 | | 20 00 |
| Planting, 2 horses, 3½ hours at 56 cents | | 1 96 |
| Planting, 2 men, 7 hours at 28 cents | | 1 96 |
| Cultivating, 3 times, 6 hours at 44 cents | | 2 64 |
| Hoeing, 12 hours at 28 cents | | 3 36 |
| Hilling up, twice, 2 horses, 8 hours at 56 cents | | 4 48 |
| Spraying, 2 horses and man, 2 hours at 84 cents | | 1 68 |
| Spraying material— | | |
| 18 pounds bluestone at 8¼ cents | $ 1 49 | |
| 18 pounds lime at 1¼ cents | 0 23 | |
| 4 pounds arsenate of lime at 35 cents | 1 40 | |
| | | 3 12 |
| Cost of digging and storing— | | |
| 3 horse team and driver, 6½ hours at 68 cents | | 4 42 |
| Picking and sorting, 1 man, 42½ hours at 28 cents | | 11 90 |
| Hauling to storage, 1 horse and driver, 9 hours at 44 cents | | 3 96 |
| Total cost per acre | | $ 88 13 |
| Less 21·3 bushels small potatoes at 20 cents | | 4 26 |
| Total cost of marketable potatoes | | $ 83 87 |
| Yield of marketable potatoes per acre, 196 bushels. | | |
| Cost to produce 1 bushel, 41·9 cents. | | |

N.B.—Two applications of bordeaux 4–4–40 were applied with a power outfit, 75 gallons spray was applied each time. The varieties used in cost of production were Irish Cobbler and Davies Warrior.

## FLORICULTURE

The summer of 1923 was well suited to the growing of annuals. Weather was favourable for transplanting to the open, as local showers saved the plants from wilting or from other check. All varieties made a continuous, strong growth with an abundance of bloom throughout the season or until cut down by frost the latter part of October. The display was one of the best recorded for many years and was highly commended by the visiting public. The greater percentage were started in the hot bed, then transplanted to the open when danger of frost was over. The collection of annuals tested included the following, which are recommended for ease in growing together with good landscape effects: (Asters)—Meteor, Snow Queen, Buff Beauty, American Beauty, Giant Comet, Primrose Queen, Imperial Rose, King Violet and a number of others, the names of which may be procured by applying to this Farm. These were planted on April 11, transplanted the last of June and began blooming August 15. Other annuals tested were antirrhium, ageratum, balsam, castor oil, calendula, clarkia, cosmea, candytuft, cornflower, chrysanthemum, dianthus, dahlia cactus, jacobea kochia (foliage), petunia, golden feather, phlox, rhodanthe, scabious schizanthus, salpiglossis, tagetes, nasturtium, pansies, verbena and stocks. All varieties did well. Sweet peas were planted May 10 and made a splendid showing during the summer. The variety test did especially well. Seeds selected from the variety test lots in other years have given better results than commercial seed, but the white and red and white varieties predominate in all such selections. As forty-five varieties were tested, a complete list cannot be published, but the following are among the best: Jean Ireland, Renown, Royal Purple, Royal Scott, Matchless, Annie Ireland and Mrs. Tom Jones.

### BULBS

Seven varieties of daffodils were planted in beds on October 2. They were mulched with a light coat of strawy manure as soon as the ground was frozen. This was removed on May 2. The following varieties are in order of merit: Golden Spur, Sir Watkin, Princeps, Empress, Madame de Graaf, Victoria and White Lady. Six varieties of early tulips and twenty-three of Darwin tulips were planted at the same time and received the same treatment as the daffodils. The majority of these gave excellent bloom.

Fifteen varieties of gladioli were tested and made splendid growth with good bloom. Paname, Mrs. Frank Pendleton and Prince of Wales gave the best results.

### PERENNIALS

A well-arranged perennial border adds much to the beauty of the grounds. This can be planted in such a way that there will be a continual bloom from early spring until late fall. There are many perennials that do well in this district and from records taken during the past years, the following have seldom failed to make an attractive border: Larkspur, lupine, irises, hollyhocks, golden glow, white rocket, sweet william, aquilegia, paeonies and dahlias. The dahlias, of which there were thirty varieties, gave abundant bloom. The following are recommended for decorative purposes: Single Violet, Snowdrop, Dewdrop, Diadem, Liberty, Mrs. Bottomly, Baron de Grancey, Son-de-Chabanne and Yellow Colosse.

### ROSES

Twenty-five new varieties of roses were planted on May 22. All made good growth for the first season but the bloom was light, the varieties tested are as follows: A. K. Williams, Chas. Lefebvre, Fisher Holmes, Frau Karl Druschki, Gen. Jacqueminot, Hugh Dickson, Mrs. John Laing, Prince Camille de Rohan, Ulrich Brunner, Victor Hugo, Gloirede Chedane Guinoisseau, Capt. Hayword (all hybrid perpetuals), Betty, Caroline Testout, Edward Mawley, G. C. Ward, Gen. McArthur, J. B. Clark, Lady Ashtown, La France, Lady Pirrie, Lieut. Chaure, Mme. Abel Chatenay, Mme. Leon Pain, Ophelia (hybrid tea roses).

## CEREALS

### CHARACTER OF SEASON

The spring of 1923 was cold and late. Work on the land did not start until May 14 and seeding operations were started on May 25. Good growing weather prevailed during June, giving the grain a good start, but the summer and fall were cool and ripening was slow. October was exceptionally fine and this enabled the harvesting of the late grain without much loss from sprouting or extra handling. The straw seemed abnormally strong and little lodging was noticed even after the heavy wind and rain storm of October 1. Wheat was the only cereal which was difficult to dry. Harvesting and threshing of plot grain commenced on August 25 and September 7 respectively.

### VARIETY TESTS OF GRAIN

The test plots of oats, barley and wheat were seeded on land which had been in root plots the previous season. The land was a medium clay loam in excellent tilth and had received an application of 16 tons barnyard manure in 1922. The buckwheat plots were seeded on a light clay loam soil, in the variety test orchard on the side hill. All varieties of grain were sown in duplicate plots of one-sixtieth acre each.

## SPRING WHEAT

Elite stock seed of nine varieties of spring wheat was sown on duplicate plots May 25. All were very slow in ripening, Ruby being the earliest by eight days. White Russian gave the highest yield but was followed closely by Charlottetown No. 123, a new variety, originated at the Experimental Farm, Charlottetown. This is a very promising variety, being a harder wheat than White Russian although the straw is weaker than some of the older varieties.

SPRING WHEAT—AVERAGE YIELDS

| Variety | Years tested | Number days maturing | Average yield per acre | |
|---|---|---|---|---|
| | | | bush. | lbs. |
| White Russian | 8 | 124·1 | 34 | 31·3 |
| Huron, Ottawa 3 | 11 | 109·3 | 34 | 25·0 |
| Marquis, Ottawa 15 | 11 | 110·3 | 31 | 57·5 |
| Red Fife, Ottawa 16 | 11 | 113·0 | 31 | 54·0 |
| Early Red Fife, Ottawa 17 | 11 | 112·8 | 31 | 28·1 |
| Ruby, Ottawa 623 | 6 | 102·8 | 27 | 47·0 |
| Bishop | 11 | 108·8 | 27 | 38·6 |

## BARLEY

Six six-rowed and three two-rowed varieties of barley were tested in 1923. These were sown on May 26 in duplicate plots. The six-rowed all ripened uniformly, Alberta Ottawa 54 being the earliest and also the poorest yielder. Manchurian Ottawa 50 was the best yielder and has proven to be one of our best varieties. The following table gives average yield for the period 1914 to 1923 inclusive:

BARLEY—AVERAGE YIELDS

| Variety | Years tested | Number days maturing | Average yield per acre | |
|---|---|---|---|---|
| | | | bush. | lbs. |
| (*Six-rowed*)— | | | | |
| O.A.C. No. 21 | 9 | 98·4 | 43 | 41·1 |
| Stella, Ottawa 58 | 10 | 99·8 | 41 | 43·5 |
| Manchurian, Ottawa 50 | 10 | 98·5 | 39 | 42·9 |
| Albert, Ottawa 54 | 5 | 85·4 | 34 | 36·8 |
| Himalayan, Ottawa 59 (hulless) | 3 | 86·3 | 40 | 26·0 |
| Chinese, Ottawa 60 | 2 | 92·5 | 53 | 21·0 |
| (*Two-rowed*)— | | | | |
| Charlottetown No. 80 | 6 | 96·8 | 56 | 20·3 |
| French Chevalier | 10 | 100·6 | 49 | 15·3 |
| Duckbill | 6 | 97·5 | 45 | 23·0 |

## OATS

Twelve varieties of oats were tested in 1923. They were sown on May 26 and 28 and harvested between September 6 and 19. O.A.C. No. 72 and Lincoln showed the weakest straw but none were badly lodged. Banner Ottawa 49 outyielded all other varieties. Daubeney Ottawa 47, under Maritime conditions, has gradually been getting later in ripening until this year it was the last variety to ripen. Alaska and Ligowo are our earliest varieties. Liberty, a hulless variety, is of value where a low fibre home-grown feed is desired.

OATS—AVERAGE YIELDS

| Variety | Years tested | Number days maturing | Average yield per acre | |
|---|---|---|---|---|
| | | | bush. | lbs |
| Banner | 11 | 105·3 | 75 | 1·8 |
| Victory | 11 | 105·8 | 73 | 27·0 |
| Lincoln | 11 | 106·0 | 73 | 10·7 |
| Danish Island | 11 | 105·8 | 71 | 7·8 |
| O.A.C. No. 72 | 8 | 104·1 | 70 | 21·2 |
| Gold Rain | 11 | 104·5 | 69 | 8·5 |
| Ligowo | 11 | 104·7 | 67 | 33·8 |
| Pioneer | 10 | 103·0 | 67 | 25·4 |
| Daubeney, Ottawa 47 | 9 | 100·2 | 62 | 15·1 |
| Liberty (hulless) | 4 | 92·5 | 59 | 15·0 |
| Alaska | 2 | 94·0 | 68 | 18·0 |

BUCKWHEAT

Twelve varieties and strains of buckwheat were sown on June 22 on duplicate one-sixtieth-acre plots. The stand was uneven and while the yields were comparative of the different varieties, they were below average. Tartarian and Rye are the varieties recommended for general growing, while for flour purposes, Silverhull is the best.

ELITE STOCK SEED

The growing of high quality elite seed on the basis of propagating registered seed for general distribution is being carried on. Wheat, oats, and barley are the crops grown for this purpose and a limited amount of seed will be available to farmers.

## FORAGE CROPS

CHARACTER OF SEASON, 1923

Spring opened late and the root and ensilage crops were late in getting started. Dry weather in June, followed by an exceedingly heavy rain on June 29 retarded the growth of these crops. The ensilage crops were below average, but good growing weather in the summer and autumn gave us a bumper turnip crop. Carrots and mangels, which require a warmer season, gave poor yields. The hay crop was above average and was harvested in good condition. The clover growth was excellent and furnished plenty of aftermath for pasturage, which was good all through the season. Good stands were obtained on the fields seeded in 1923. A heavy rain on October 1 made harvesting difficult for some time but fine weather until the middle of November gave ample time to store all crops in good condition.

CHARACTER OF SOIL AND CULTURAL METHODS

The soil used for forage crop test plots was a medium to light clay loam in good fertility. The root and ensilage ground was manured and ploughed in the fall and was in good shape when seeded the first and second week in June. Roots were sown with the hand drill and the corn and sunflowers with the corn planter.

### CROPS FOR ENSILAGE

INDIAN CORN FOR ENSILAGE

Sixteen varieties or strains of corn were tested in 1923. These were planted on June 2 in rows three feet apart. The ground being cold, germination was weak and only a medium stand was obtained. Growth was only fair and no varieties were matured beyond the milk stage when harvested on October 3.

Longfellow, being a flint variety and maturing earlier than most of the dent varieties, is recommended for use in the Maritime Provinces for ensilage purposes. Twitchel's Pride and Quebec 28 will usually ripen here, but do not give sufficient tonnage for ensilage purposes.

### SUNFLOWERS

Nine varieties were tested in 1923. They were sown on June 2 on light clay loam soil, in rows three feet apart. Germination with most varieties was good and growth strong. The plots were harvested on October 3 with the following results:—

TEST OF SUNFLOWERS

| Variety | Height when cut | Stage of maturity | Average yield per acre | Remarks as to quality and growth |
|---|---|---|---|---|
| | inch | | tons lbs. | |
| Manteca—C.P.R. | 71 | Soft dough.. | 24 1,750 | Excellent. |
| Black—C.P.R. | 65 | Hard dough | 21 1,450 | Excellent growth, coarse stems |
| Mixed—C.P.R. | 73 | Hard dough | 19 1,750 | Excellent. |
| Ottawa No. 76 | 83 | Soft dough. | 17 1,500 | Good quality, growth not uniform. |
| Giant Russian-Disco | 133 | Full bloom. | 18 750 | Fine stems, small heads. |
| Mammoth Russian—McD. | 97 | Soft dough. | 14 1,250 | Fair growth, good quality. |
| Rissian Giant—C.P.R. | 98 | Soft dough. | 10 1,250 | Fair growth, good quality. |
| Mixed Menonite—Rosthern | 70 | Ripe..... | 8 1,200 | Cut early for best results. |
| Manchurian—McKenzie | 79 | Soft dough. | 8 1,000 | Fair quality, uneven growth. |

## ROOTS

### MANGELS

Twenty-five varieties or strains of mangels were tested in 1923. These were sown in duplicate one-one hundredth-acre plots on June 6. Owing to the dry, cool weather, germination was poor and growth only fair all through the season. Harvesting was completed on October 26 and and the yields recorded were as follows:—

MANGEL—VARIETY TEST

| Variety | Corrected average yield per acre | | Remarks |
|---|---|---|---|
| | tons lbs. | bush. | |
| Jumbo—Rennie | 29 1,500 | 1,190 | Prongy. |
| Yellow Leviathan—Rennie | 28 900 | 1,138 | Smooth and uniform. |
| Leviathan—Rennie | 28 100 | 1,122 | Not uniform. |
| Barres Sludstrup—D.L.F. | 27 1,200 | 1,104 | Uniform in type and colour. |
| Barres Stryno—D.L.F. | 26 1,900 | 1,078 | Prongy. |
| Yellow Intermediate—Ottawa | 25 1,600 | 1,032 | Very uniform. |
| Barres Tystophe—D.L.F. | 24 1,850 | 997 | Uniform in type and colour. |
| Barres Thynos—No. 7034 | 24 50 | 961 | Fairly uniform. |
| Perfection Mammoth Long Red—Rennie | 23 1,600 | 952 | Very prongy. |
| Giant Yellow Globe—Rennie | 23 850 | 937 | Uniform. |
| Golden Tankard—Rennie | 23 600 | 932 | Not uniform. |
| Danish Sludstrup—Ewing | 22 1,050 | 901 | Uniform. |
| Sugar Mangel—D.L.F. | 22 500 | 890 | Uniform in colour and type. |
| Danish Sludstrup—McDonald | 22 400 | 888 | Very uniform. |
| Half Sugar Rose No. 1141 Trifolium | 21 1,550 | 871 | Poor growth, uniform. |
| Runkelrocfro Barres Sludstrup No. 3084 | 20 700 | 814 | Fairly uniform. |
| Selected Giant Rose Intermediate Sugar—Ewing | 19 1,350 | 787 | Very uniform. |
| Red Globe—D. and F. | 19 700 | 774 | Uniform, easy to harvest. |
| Green Top White Sugar—Ewing | 18 1,900 | 758 | Prongy. |
| Red Globe—Ewing | 17 ..... | 680 | Not uniform, easy to pull. |
| Giant Yellow Globe—Ewing | 16 1,550 | 671 | Uniform, easy to pull. |
| Golden Globe—Sutton | 16 1,050 | 661 | Uniform, easy to pull. |
| Golden Tankard—Ewing | 16 50 | 641 | Not uniform. |
| Long Yellow—Ewing | 14 1,900 | 598 | Uniform in colour and type. |
| Long Red Mammoth—Ewing | 14 400 | 568 | Very prongy. |

The same facts are noticed this year as in 1922, namely, the extreme variation in seed selections of the same variety from different sources. This is no doubt due to the varying vitality of the seed. The highest-yielding varieties show a lack of uniformity which is an undesirable factor. The individual roots of these varieties, while not uniform were heavier than the more uniformly shaped roots of other varieties which put them on top as far as yield is concerned. The corrected yield shows the yield per acre with a perfect stand. A perfect stand for mangels is based on a row 174 feet long, having 261 roots 8 inches apart.

### CARROTS

Fourteen varieties or strains of field carrots were sown on June 6. Germination was poor, due to the soil being dry and cold at the time of planting. This dry period was followed by a very heavy rain which formed a hard crust and the weaker plants were unable to push their way through. This resulted in a stand much below the average for carrots and applied to mangels and turnips to a less degree.

Champion 7031 from Denmark leads all other varieties in average corrected yield. Danish Champion was second highest with White Belgian from Dupuis and Furguson coming third. Carrots, owing to their variable yields, are only recommended for growing on small areas as a food for idle horses during the winter.

### TURNIPS

Twenty-eight varieties or selections of Swedes and three varieties of fall turnips were sown on June 7. Germination was slow and growth in the summer and fall was excellent. Harvesting was completed on October 30. The fall turnips should have been harvested a month earlier to get the best results. The yields obtained are given in the following table:—

TURNIP VARIETY TEST

| Variety | Corrected average yield per acre | | | Remarks |
|---|---|---|---|---|
| *Swede*— | tons | lbs. | bush. | |
| Hall's Westbury—Ewing | 35 | 1,950 | 1,439 | Uniform. |
| Bangholm—Ewing | 35 | 1,750 | 1,435 | Excellent. |
| Invicta Bronze Top—Rennie | 35 | 1,600 | 1,432 | Uniform. |
| Magnum Bonum—Ewing | 35 | 1,500 | 1,403 | Large and rough. |
| Bangholm Purple Top—Rennie | 35 | 50 | 1,401 | Uniform. |
| Pajbjerg Bangholm No. 7022 | 34 | 1,400 | 1,388 | Uniform. |
| Kaalroc Wilhelmsburger D.L.F. | 34 | 300 | 1,366 | Excellent. |
| Best of All—Ewing | 33 | 1,050 | 1,341 | Uniform. |
| Thyberd Swede No. 2056 | 32 | 600 | 1,292 | Uniform. |
| Bangholm Sludsgaard—D.L.F. | 32 | 100 | 1,282 | Excellent. |
| Monarch—Nappan | 32 | 50 | 1,281 | Uniform. |
| Invicta Bronze Top—Ewing | 31 | 1,950 | 1,279 | Uniform. |
| Sutton's Champion Purple Top—Rennie | 31 | 1,600 | 1,272 | Uniform. |
| Best of All—Rennie | 31 | 200 | 1,244 | Uniform. |
| Elephant or Monarch Improved—Ewing | 31 | 100 | 1,242 | Lacks uniformity. |
| Kangaroo Bronze Green Top—Rennie | 30 | 1,900 | 1,238 | Rough. |
| Improved Jumbo or Elephant—Rennie | 29 | 1,800 | 1,196 | Lacks uniformity. |
| Kaalrabrifro Bangholm No. 7021 | 29 | 1,100 | 1,182 | Uniform. |
| Sutton's Champion—Ewing | 21 | 950 | 1,179 | Uniform. |
| Bangholm—Charlottetown Selection | 29 | 150 | 1,163 | Very uniform. |
| Selected Hazard's Improved—Rennie | 28 | 1,450 | 1,149 | Uniform. |
| Hall's Westbury—Rennie | 28 | 450 | 1,129 | Rough, not uniform. |
| Selected Magnum Bonum—Rennie | 26 | 50 | 1,041 | Uniform. |
| Bangholm Lyngby—D.L.F. | 25 | 1,700 | 1,034 | Uniform. |
| Bangholm Clubroot Resistant | 25 | 50 | 1,001 | Uniform. |
| Bangholm—McKenzie | 24 | 1,550 | 991 | Uniform. |
| Danish Sludstrup—McDonald | 22 | 1,600 | 912 | Lacks uniformity. |
| Ditmars—McNutt | 21 | 1,300 | 866 | Uniform. |
| *Fall Turnips* | | | | |
| Dalis Swede—D.L.F. | 30 | 000 | 1,200 | Badly rotted. |
| Fynsk Bortfelder, D.L.F. | 29 | 1,100 | 1,182 | Badly rotted. |
| Yellow Tankard—D.L.F. | 23 | 1,350 | 947 | Some rot. |

CLUB-ROOT RESISTANCE IN STRAINS OF TURNIPS

| Variety | Average Two Plots | | |
|---|---|---|---|
| | Total roots | Number roots club-rooted | Per cent club-root |
| *Swede* | | | |
| Bangholm Sludsgaard—D.L.E | 137·5 | ..... | 0·0 |
| Thyherd Swede No. 2056—Denmark | 122·5 | ..... | 0·0 |
| Bangholm Club-root-Resistant—Charlottetown | 141·5 | 2·0 | 1·4 |
| Pajbjerg Bangholm No. 7022—Denmark | 129·5 | 2·0 | 1·5 |
| Bangholm—Charlottetown Selection | 127·5 | 3·0 | 2·3 |
| Kaalrabrifro Bangholm No. 7021—Denmark | 130·5 | 3·5 | 2·6 |
| Invicta Bronze Top—Rennie | 82·5 | 3·0 | 3·2 |
| Kangaroo Bronze Green Top—Rennie | 124·5 | 4·5 | 3·6 |
| Kaalroc Wilhelmisburger—D.L.F | 123·0 | 4·5 | 3·6 |
| Invicta Bronze Top—Ewing | 119·0 | 4·5 | 3·8 |
| Best of All—Rennie | 118·5 | 4·5 | 3·8 |
| Improved Jumbo or Elephant—Rennie | 127·5 | 5·0 | 3·9 |
| Monarch—Nappan | 103·5 | 4·5 | 4·3 |
| Selected Hazards Improved—Rennie | 127·0 | 6·0 | 4·7 |
| Selected Magnum Bonum—Rennie | 141·5 | 7·0 | 4·9 |
| Magnum Bonum—Ewing | 116·5 | 10·0 | 8·58 |
| Hall's Westbury—Ewing | 122·0 | 11·0 | 8·9 |
| Ditmars—McNutt | 129·5 | 14·0 | 10·8 |
| Bangholm Purple Top—Rennie | 110·5 | 18·0 | 11·7 |
| Best of All—Ewing | 110·5 | 14·0 | 12·6 |
| Hall's Westbury—Rennie | 111·0 | 16·0 | 14·4 |
| Bangholm—Ewing | 113·5 | 17·0 | 14·9 |
| Elephant or Monarch Improved—Ewing | 121·0 | 19·5 | 16·1 |
| Danish Sludstrup—McDonald | 113·0 | 34·5 | 30·5 |
| Sutton's Champion—Ewing | 123·0 | 41·5 | 33·7 |
| Bangholm Lyngby—D.L.F | 103·0 | 40·0 | 38·6 |
| Bangholm—McKenzie | 115·0 | 54·0 | 46·7 |
| *Fall Turnips* | | | |
| Dalis Swede—D.L.F | 92·5 | 8·0 | 8·6 |
| Yellow Tankard—D.L.F | 107·0 | 14·0 | 13·0 |
| Fynsk Bortfelder—D.L.F | 88·0 | 15·0 | 17·0 |

## SUGAR BEETS

Five strains of true sugar beets were included in the roots tests in 1923. The tests for sugar content were made by the Division of Chemistry at Ottawa from representative roots selected from each plot. The following data were recorded:—

SUGAR BEET VARIETY TEST

| Variety | Corrected average yield per acre | | | Analysis of Dominion Chemist | | | |
|---|---|---|---|---|---|---|---|
| | | | | Sugar in juice | Co-efficient of purity | Average weight of one root | |
| | tons | lbs. | bush. | per cent | per cent | lbs. | oz. |
| Dominion Sugar Co., Sluice Bros., Holland | 21 | 1,000 | 860 | 18·20 | 84·01 | 1 | 1 |
| Dominion Sugar Co., Kitchener | 19 | 1,550 | 791 | 17·52 | 85·94 | 1 | 6 |
| Dominion Sugar Co., Chatham | 19 | 600 | 772 | 17·03 | 86·02 | 1 | 2 |
| Vilmorin's Imp. Selection B | 18 | 1,500 | 730 | 17·99 | 84·47 | 1 | 3 |
| Dominion Sugar Co., Hemming and Harving, Holland | 12 | 1,300 | 506 | 17·33 | 85·76 | 1 | – |

# GRASSES AND CLOVERS

## SEEDING MIXTURES

This experiment was conducted on field B3. The plots were 1·7 acres in size and the following results were obtained:—

| Plot No. | Grass seed mixtures | Yield of hay per acre |
|---|---|---|
| | | tons |
| 1 | 8 pounds red clover, 2 pounds alsike, 7 pounds timothy, 2 pounds meadow fescue | 3·24 |
| 2 | 8 pounds red clover, 2 pounds alsike, 7 pounds timothy, 4 pounds meadow fescue | 3·12 |
| 3 | 8 pounds red clover, 2 pounds alsike, 7 pounds timothy, 6 pounds meadow fescue | 2·29 |
| 4 | 8 pounds red clover, 2 pounds alsike, 6 pounds timothy, 2 pounds meadow fescue | 2·00 |
| 5 | 8 pounds red clover, 2 pounds alsike, 6 pounds timothy, 4 pounds meadow fescue | 2·55 |
| 6 | 8 pounds red clover, 2 pounds alsike, 6 pounds timothy, 6 pounds meadow fescue | 3·25 |
| 7 | 8 pounds red clover, 2 pounds alsike, 10 pounds timothy | 3·18 |

## GRASSES WITH CLOVERS AND ALONE

The object of this experiment is to ascertain the production of the various grasses when sown alone and in combination with red clover, alsike and red clover and alsike as a leguminous base. The following are the results for 1923:—

GRASSES WITH CLOVERS AND ALONE

| Seed mixtures | Green weight | Average per acre | | Average dry matter per acre | Lodged |
|---|---|---|---|---|---|
| | | Cured as hay | Dry matter in crop | | |
| | tons lbs. | tons lbs. | per cent | lbs. | per cent |
| 10 pounds red clover, 8 pounds timothy | 14 740 | 4 1,400 | 24·10 | 6,935·59 | 45 |
| 10 pounds red clover, 15 pounds meadow fescue | 13 1,500 | 4 1,180 | 28·90 | 7,581·40 | 95 |
| 10 pounds red clover, 15 pounds orchard grass | 12 740 | 3 1,960 | 23·60 | 5,690·63 | 40 |
| 10 pounds red clover, 6 pounds timothy, 10 pounds meadow fescue | 13 580 | 4 1,860 | 24·62 | 6,347·90 | 60 |
| 10 pounds red clover, 6 pounds timothy, 10 pounds orchard grass | 12 000 | 3 1,680 | 24·36 | 5,846·40 | ..... |
| 10 pounds red clover, 10 pounds meadow fescue, 10 pounds orchard grass | 12 340 | 4 1,180 | 24·73 | 6,017·37 | ..... |
| 6 pounds alsike, 8 pounds timothy | 13 1,100 | 5 60 | 23·81 | 6,452·81 | 55 |
| 6 pounds alsike, 15 pounds meadow fescue | 12 960 | 4 1,100 | 26·84 | 6,685·74 | 100 |
| 6 pounds alsike, 15 pounds orchard grass | 10 460 | 3 1,380 | 24·80 | 5,075·22 | ..... |
| 6 pounds alsike, 6 pounds timothy, 10 pounds meadow fescue | 11 1,700 | 4 1,040 | 28·92 | 6,834·54 | 95 |
| 6 pounds alsike, 6 pounds timothy, 10 pounds orchard grass | 9 1,120 | 3 1,600 | 29·40 | 5,621·38 | ..... |
| 6 pounds alsike, 10 pounds orchard grass, 10 pounds meadow fescue | 10 1,400 | 4 680 | 29·63 | 6,341·42 | ..... |
| 8 pounds red clover, 2 pounds alsike, 8 pounds timothy | 14 1,520 | 4 1,720 | 25·27 | 7,457·79 | 65 |
| 8 pounds red clover, 2 pounds alsike, 15 pounds meadow fescue | 12 1,240 | 4 1,340 | 29·06 | 7,296·31 | 98 |
| 8 pounds red clover, 2 pounds alsike, 15 pounds orchard grass | 10 1,100 | 4 000 | 24·59 | 5,136·34 | ..... |
| 8 pounds red clover, 2 pounds alsike, 6 pounds timothy, 10 pounds meadow fescue | 12 420 | 4 1,940 | 27·67 | 6,468·33 | 50 |
| 8 pounds red clover, 6 pounds timothy, 10 pounds orchard grass | 13 900 | 5 620 | 24·10 | 6,478·96 | 12 |
| 8 pounds red clover, 10 pounds meadow fescue, 10 pounds orchard grass | 13 880 | 5 820 | 24·66 | 6,611·26 | 10 |
| 12 pounds timothy | 9 700 | 5 400 | 36·11 | 6,717·62 | 20 |
| 30 pounds meadow fescue | 8 500 | 4 400 | 36·76 | 6,063·84 | 78 |
| 30 pounds orchard grass | 4 1,620 | 2 700 | 34·50 | 3,315·81 | ..... |
| 8 pounds timothy, 15 pounds orchard grass | 7 800 | 3 120 | 30·54 | 4,519·92 | ..... |
| 15 pounds meadow fescue, 15 pounds orchard grass | 7 380 | 3 400 | 32·91 | 4,689·28 | ..... |

RATES OF SEEDING HAY AND PASTURE MIXTURES

The variations in the mixtures, noted in the following table, are very slight with one exception, namely, the No. 2 mixture, which shows a higher dry matter yield per acre; but as these are only one year's results, no definite deductions can be drawn.

RATES OF SEEDING HAY AND PASTURE MIXTURES

| Seed mixtures | Green weight | Average per acre | | Average dry matter per acre | Lodged |
|---|---|---|---|---|---|
| | | Cured as hay | Dry matter in crop | | |
| | tons lbs. | tons lbs. | per cent | lbs. | per cent |
| 10 pounds red clover, 8 pounds timothy | 13 ..... | 4 1,500 | 28·09 | 7,309·38 | 75 |
| 8 pounds red clover, 8 pounds timothy, 2 pounds alsike | 13 1,120 | 4 1,360 | 30·40 | 8,255·84 | 70 |
| 5 pounds red clover, 8 pounds timothy, 5 pounds alsike | 12 1,500 | 4, 1,080 | 30·33 | 7,697·58 | 70 |
| 8 pounds red clover, 6 pounds timothy, 2 pounds alsike, 2 pounds red top | 12 1,900 | 4 880 | 27·17 | 7,016·15 | 30 |
| 8 pounds red clover, 4 pounds timothy, 2 pounds alsike, 4 pounds red top | 11 1,160 | 4 880 | 30·83 | 6,992·77 | 37 |
| 8 pounds red clover, 6 pounds timothy, 2 pounds alsike, 2 pounds red top, 6 pounds meadow fescue | 13 1,200 | 4 880 | 26·44 | 7,199·28 | 88 |
| 8 pounds red clover, 4 pounds timothy, 2 pounds alsike, 4 pounds red top, 6 pounds meadow fescue | 13 340 | 4 680 | 27·83 | 7,291·62 | 88 |

EARLY AND LATE RED CLOVER WITH EARLY AND LATE GRASSES

While no definite deductions may be drawn from one year's results yet from the table following it may be noted that where fescue replaced timothy, the dry matter per acre was reduced. The early clover was in full bloom on July 30 and 40 per cent in bloom August 8, and fescue was in full bloom July 24.

EARLY AND LATE RED CLOVER WITH EARLY AND LATE GRASSES

| Seed mixtures | Green weight | Average per acre | | Average dry matter per acre | Quality of hay |
|---|---|---|---|---|---|
| | | Cured as hay | Dry matter in crop | | |
| | tons lbs. | tons lbs. | per cent | lbs. | per cent |
| 10 pounds early red clover, 8 pounds timothy | 12 1,080 | 4 1,880 | 30·79 | 7,678·61 | Fair. |
| 10 pounds early red clover, 15 pounds meadow fescue | 12 360 | 4 740 | 29·44 | 7,176·43 | Good. |
| 10 pounds late red clover, 8 pounds timothy | 13 1,920 | 4 1,820 | 34·45 | 9,448·73 | Good. |
| 10 pounds late red clover, 15 pounds meadow fescue | 11 1,660 | 3 1,740 | 30·75 | 7,291·63 | Excellent. |

MEADOW FESCUE IN HAY AND PASTURE MIXTURES

| Seed mixtures | Green weight | Average per acre | | Average dry matter per acre | Lodged |
|---|---|---|---|---|---|
| | | Cured as hay | Dry matter in crop | | |
| | tons lbs. | tons lbs. | per cent | lbs. | per cent |
| 8 pounds red clover, 2 pounds alsike, 8 pounds timothy | 9 1,200 | 3 1,700 | 34·53 | 6,607·04 | 88 |
| 8 pounds red clover, 2 pounds alsike, 7 pounds timothy, 2 pounds meadow fescue | 10 400 | 4 520 | 35·34 | 7,217·88 | 95 |
| 8 pounds red clover, 2 pounds alsike, 7 pounds timothy, 4 pounds meadow fescue | 9 1,840 | 4 100 | 34·91 | 6,923·11 | 95 |
| 8 pounds red clover, 2 pounds alsike, 7 pounds timothy, 6 pounds meadow fescue | 9 1,600 | 4 500 | 41·13 | 8,049·48 | 93 |
| 8 pounds red clover, 2 pounds alsike, 6 pounds timothy, 2 pounds meadow fescue | 11 200 | 5 140 | 36·38 | 8,019·34 | 88 |
| 8 pounds red clover, 2 pounds alsike, 6 pounds timothy, 4 pounds meadow fescue | 11 1,000 | 4 1,460 | 34·42 | 7,902·50 | 90 |
| 8 pounds red clover, 2 pounds alsike, 6 pounds timothy, 6 pounds meadow fescue | 9 260 | 4 60 | 39·56 | 7,217·65 | 83 |

NOTE.—Mixtures No. 4 and 5 show the highest dry matter yield from one year's test, but one year's results cannot be taken as definite.

VARIETY TESTS—DUTCH CLOVER

| Variety | Green weight | Average per acre | | Average dry matter per acre | Growth |
|---|---|---|---|---|---|
| | | Cured as hay | Dry matter in crop | | |
| | tons lbs. | tons lbs. | per cent | lbs. | |
| Scottish | 6 1,560 | 1 1,300 | 24·84 | 3,375·9 | Fine. |
| Danish Morso | 7 640 | 1 200 | 19·04 | 2,720·24 | Medium. |
| Commercial | 6 1,060 | 1 100 | 21·12 | 2,764·02 | Medium. |
| Kentish | 6 980 | 1 100 | 20·18 | 2,606·02 | Fine. |
| Danish Stryno | 6 1,920 | 1 60 | 19·32 | 2,668·29 | Coarse. |
| Landino | 5 80 | .. 1,300 | 18·36 | 1,837·81 | Very coarse. |

The Scottish variety gave the highest dry matter yield per acre. The Danish Morso, Commercial, Kentish and Danish Stryno vary slightly. Ladino was the poorest, the growth being decidedly coarse.

VARIETY TEST—RED CLOVER

| Variety | Green weight | Average per acre | | Average dry matter per acre | Lodged |
|---|---|---|---|---|---|
| | | Cured as hay | Dry matter in crop | | |
| | tons lbs. | tons lbs. | per cent | lbs. | per cent |
| Alta Swede—University of Alberta | 14 320 | 3 1,600 | 25·78 | 7,300·90 | 80 |
| Late Red Alta Swede | 14 400 | 3 1,400 | 24·36 | 6,918·24 | 90 |
| Late Red Swedish | 13 1,200 | 3 1,200 | 25·14 | 6,838·08 | 90 |
| Early Red Swedish | 12 640 | 3 200 | 26·19 | 6,453·22 | 100 |
| Medium Late Swedish | 9 600 | 2 1,200 | 31·07 | 5,779·02 | 60 |
| France 535 | 5 600 | 2 400 | 32·05 | 3,597·30 | 25 |
| France 500 | 7 000 | 2 160 | 31·91 | 4,467·40 | 20 |
| Ottawa | 6 640 | 2 80 | 36·96 | 4,671·74 | 45 |
| Ottawa 1917-20 | 6 480 | 2 ..... | 33·73 | 4,209·50 | 25 |
| Ottawa 1916-20 | 5 1,640 | 1 1,800 | 33·11 | 3,854·0 | 50 |
| France 533 | 6 1,800 | 1 1,720 | 31·28 | 4,316·64 | ..... |
| Kenora | 6 480 | 1 1,560 | 23·22 | 2,897·86 | 60 |
| St. Casemir, Que | 5 1,600 | 1 1,400 | 32·14 | 3,728·24 | 75 |
| St. Clet, Que | 5 1,360 | 1 1,200 | 31·80 | 3,612·48 | 70 |
| Italy 536 | 1 840 | .. 720 | 28·79 | 817·64 | ..... |

Alta Swede-University of Alberta leads in production of dry matter per acre from a one-year test. Late Red Alta Swede, Late Red Swedish, Early Red Swedish and Medium Late Swedish rank about equal in yield and dry matter content per acre.

ALSIKE—VARIETY TEST

| Variety | Green weight | Average per acre | | Average dry matter per acre | Winter-killed |
|---|---|---|---|---|---|
| | | Cured as hay | Dry matter in crop | | |
| | tons lbs. | tons lbs. | per cent | lbs. | per cent |
| Quebec | 7 1,780 | 3 675 | 33·87 | 5,328·83 | 9 |
| Swedish | 7 1,900 | 2 1,680 | 35·00 | 5,555·76 | 15 |
| Nova Scotia Commercial | 6 940 | 2 820 | 35·16 | 4,564·85 | 30 |
| Northern Ontario | 6 400 | 2 650 | 34·13 | 4,213·82 | 28 |

The variety, Swedish Alsike, under one year's test gave the highest dry matter per acre but was surpassed by Quebec variety in withstanding the winter-killing.

ALFALFA

| Method of sowing | Green weight | Average per acre | | Average dry matter per acre | Winter-killed |
|---|---|---|---|---|---|
| | | Cured as hay | Dry matter in crop | | |
| | tons lbs. | tons lbs. | per cent | lbs. | per cent |
| Without nurse crop, broadcast, 20 pounds per acre | 8 1,670 | 2 394 | 30·96 | 5,470·63 | 5 |
| Without nurse crop, 12-inch rows, 10 pounds per acre | 7 1,323 | 1 1,996 | 32·75 | 5,018·28 | 45 |
| With nurse crop, broadcast, 20 pounds per acre | 4 347 | .. 1,875 | 25·04 | 2,090·09 | 75 |
| With nurse crop, 12-inch rows, 10 pounds per acre | 5 000 | 1 515 | 20·29 | 2,029·00 | 75 |

Although the seeding in rows without nurse crop was quite badly winter-killed, the remaining plants gave better growth than did the broadcast without nurse crop. The plots with nurse crop winter-killed very badly and had a high percentage of weeds.

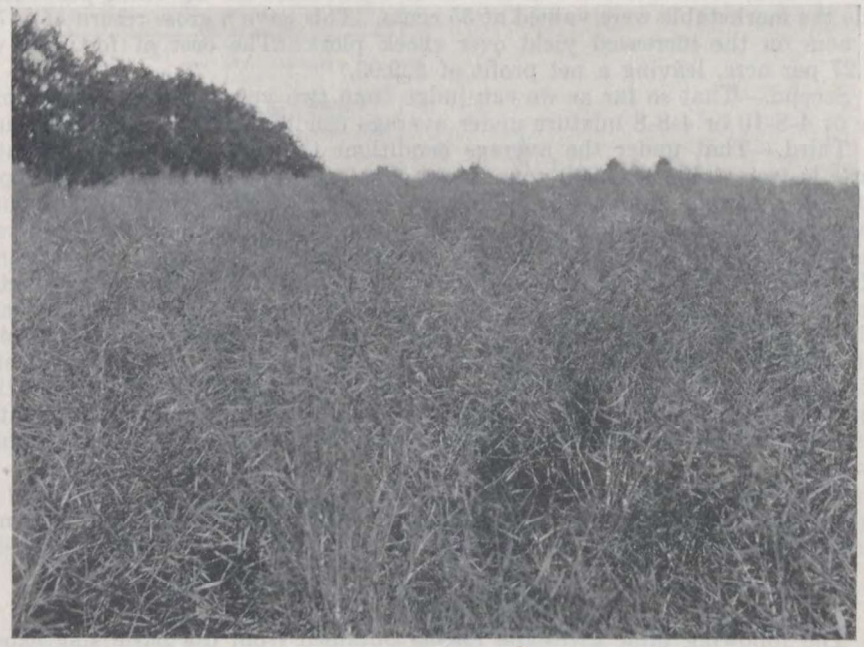
TIMOTHY—VARIETY TEST

| Variety | Green weight | Average per acre | | Average dry matter per acre | Quality |
|---|---|---|---|---|---|
| | | Cured as hay | Dry matter in crop | | |
| | tons lbs. | tons lbs. | per cent | lbs. | per cent |
| Ohio 6779 | 6 820 | 4 120 | 50·05 | 6,407·31 | Excellent. |
| Ohio 3937 | 6 1,660 | 4 40 | 45·43 | 6,215·60 | Good |
| Ohio 9352 | 6 400 | 3 1,980 | 47·22 | 5,759·89 | Good. |
| Nova Scotia Commercial | 6 1,580 | 3 1,820 | 43·97 | 5,974·10 | Good. |
| Grand Prairie | 5 1,720 | 3 1,420 | 49·76 | 5,825·43 | Fair. |
| Ohio Commercial | 5 960 | 3 1,280 | 56·73 | 6,215·98 | Fair. |
| Ottawa B.K. 1921 | 5 1,200 | 3 1,120 | 49·46 | 5,554·59 | Good. |

All varieties were very uniform in growth. The two first Ohio varieties gave somewhat better yields than any of the others, but did not run as high as the Commercial Ohio in dry matter content.

## TURNIP SEED PRODUCTION

One hundred and fifty bushels of Bangholm Club-Root-Resistant Swede turnips were pitted in the fall of 1922. When the pit was opened twenty per cent were found to be dead. The remainder were set out on May 14 on one-half acre of land.



Turnip seed production at the Experimental Farm, Nappan. Bangholm club-root-resistant strain yielded 800 pounds of seed per acre.

The yield was fair, a heavy rain and wind storm threshed out a large amount of seed, and ripening was very uneven. The seed was graded and cleaned, making 365 pounds of extra good seed and 30 pounds of light seed.

A selection of crowns was made when the stecklings were put out. No seed records were kept, but it was noticeable all through the season that the stronger crown made the better plant. Many of the weak plants died or did not mature their seed.

One hundred and sixty bushels of turnips were pitted for seed production in 1924.

## EXPERIMENTS WITH FERTILIZERS

There are two main experiments with fertilizers being conducted at this Farm. The first is a comparison of complete fertilizers of different formulae, applied to the potato crop in a three-year rotation (potatoes, oats and clover) at three rates of application. This experiment was started in 1922 and is laid off in duplicate plots of one-fortieth of an acre each, along with check plots. In 1923, the work was repeated on another area adjacent to that used in 1922.

The second is a comparison of different brands of basic slag, ground rock phosphate and superphosphate applied to the grain crop in a three-year rotation (grain, clover hay and timothy hay). This experiment is laid out in triplicate plots the same size as the preceding experiment including check plots.

### COMPLETE FERTILIZERS FOR THE POTATO CROP

While it is realized that definite conclusions cannot be drawn from one or even two years' results, there are nevertheless a few points of interest to be obtained from these tests to date.

First.—That commercial fertilizer has a distinct value in potato production. The average yield from all plots receiving an application of fertilizer was 247.6 bushels, while the average of all check plots was 107.5 bushels, showing an increase of 140.1 bushels in favour of an application of fertilizer. One-fifth of these were graded unmarketable and valued at 20 cents per bushel, while the marketable were valued at 55 cents. This gave a gross return of $67.20 per acre on the increased yield over check plots. The cost of fertilizer was $27.27 per acre, leaving a net profit of $39.93.

Second.—That so far as we can judge from two year's results a 3-8-6 mixture or 4-8-10 or 4-8-8 mixture under average conditions will give good results.

Third.—That under the average conditions the most economical quantity to use is from 1,000 to 1,200 pounds per acre. At first glance it would appear that 2,000 pounds application would be more profitable than 1,500 pounds application but when put in terms of dollars and cents, the results are different. The market value of the 15·8 bushels increase due to the larger application is $7.57 against an extra charge of $9.09 for fertilizer. This shows a reduction in profit of $1.52 per acre from the heavier application. The average increased yield of the 1,500 pound application over the 1,000 pound was 24·5 bushels with a market value of $11.52 against an extra charge of $9.09 for fertilizer. This leaves a profit or $2.43 per acre in favour of the 1,500 pound application. If interest, freight, truckage and handling charges are taken into consideration these figures indicate that around 1,000 pounds is the most economical quantity to use.

The preceding figures are based on the average yields obtained from all mixtures sown at the rate of 2,000, 1,500 and 1,000 pounds per acre. All marketable potatoes valued at 55 cents and 20 cents for unmarketable per bushel.

### BASIC SLAG EXPERIMENT

The following table gives the results obtained from the basic slag experiment conducted at this Farm for the season of 1923. All plots, check plots included, received an application of nitrate of soda and muriate of potash at the rates of 100 and 50 pounds per acre respectively at time of seeding. The table gives the quantity of each brand of slag used, the total average yield of grain and straw from the triplicate plots. It also shows the increase over average of all checks, and the value of the increased crop with profit or loss from the application. Forty per cent of the cost of the slag, which is an arbitrary percentage, was charged up against the first crop in computing the profit and loss.

| Fertilizer used | XX fortified slag 14 per cent | | XXX fortified slag 17 per cent | | Best of all fortified slag 20 per cent | | Belgian slag 16 per cent | | English* slag 16 per cent | | Not fortified open hearth 10-11 per cent | | Ground natural rock phosphate 28-30 per cent | | | Super phosphate 16 per cent | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Application..... lbs. | 1,000 | 500 | 825 | 412 | 700 | 350 | 875 | 435 | 875 | 437 | 1,270 | 635 | 1,000 | 500 | 250 | 875 | 437 |
| Total average yield of triplicate plots— | | | | | | | | | | | | | | | | | |
| Grain..... bush. | 55·7 | 48·6 | 56·8 | 62·3 | 68·6 | 54·1 | 57·6 | 61·9 | 60·4 | 58·4 | 50·2 | 54·9 | 49·4 | 50·2 | 53·3 | 49·8 | 50·6 |
| Straw..... tons | 1·76 | 1·53 | 1·9 | 1·96 | 2·03 | 1·48 | 1·82 | 1·95 | 1·93 | 1·86 | 1·58 | 1·53 | 1·53 | 1·61 | 1·71 | 1·56 | 1·69 |
| Increase over average of checks— | | | | | | | | | | | | | | | | | |
| Grain..... bush. | 3·1 | −3·9 | 4·2 | 9·8 | 16·1 | 1·5 | 5·1 | 9·4 | 7·8 | 5·8 | −2·4 | 2·4 | −3·1 | −2·4 | 0·7 | −2·7 | −1·9 |
| Straw..... tons | 0·11 | 0·12 | 0·25 | 0·31 | 0·38 | −0·17 | 0·17 | 0·3 | 0·28 | 0·21 | −0·07 | −0·12 | −0·12 | −0·04 | 0·04 | −0·09 | 0·04 |
| Value of increase— | | | | | | | | | | | | | | | | | |
| Grain..... $ | 2 01 | −2 61 | 2 74 | 6 26 | 10 26 | 0 99 | 3 25 | 5 99 | 4 00 | 3 76 | −1 50 | 1 50 | −2 01 | −1 50 | 0 49 | −1 76 | −1 25 |
| Straw..... $ | 0 44 | −0 48 | 1 00 | 1 24 | 1 52 | −0 68 | 0 68 | 1 20 | 1 12 | 0 84 | −0 28 | −0 48 | −0 48 | −0 16 | 0 16 | −0 36 | 0 16 |
| Total increase..... $ | 2 45 | −3 09 | 3 74 | 7 50 | 11 78 | −0 31 | 3 93 | 7 19 | 5 12 | 4 60 | −1 78 | 1 02 | −2 49 | −1 66 | 0 65 | −2 12 | −1 09 |
| Cost of fertiliser..... $ | 4 60 | 2 30 | 4 12 | 2 06 | 3 78 | 1 89 | 5 25 | 2 62 | 5 55 | 2 27 | 5 58 | 2 79 | 7 00 | 3 50 | 1 75 | 4 37 | 2 18 |
| Valns of increase..... $ | 2 15 | −5 39 | −0 38 | 5 44 | 8 00 | −2 20 | −1 32 | 4 57 | 0 57 | 2 33 | −7 36 | −1 77 | −9 49 | −5 16 | −1 10 | −6 49 | −3 27 |
| Gain or loss for each fertilizer..... | −1·62 | | 2·53 | | 2·90 | | 1·62 | | 1·45 | | −4·57 | | −5·25 | | | −4·88 | |

Average loss over checks, $1.08.
Average of 12 check plots—grain 52·56 bush.
straw 1·65 tons.
Average of 51 fertilized plots—grain 55·48 bush.
straw 1·73 tons.
Forty per cent of cost price of fertilizer charged against first year crop.
Prices used in above calculations, grain 64 cents per bush., straw $4 per ton, slag at market prices
*Presumably of Belgian origin.

In fertilizer investigational work it is undesirable to draw definite conclusions from one or even two years' results and more especially with a fertilizer of the nature of basic slag. Therefore, no attempt will be made to do so from this year's experiment with slag.

The average yield of grain from all the slag plots was 55.48 bushels against 52.56 bushels, the average of all checks, thus showing a difference of 2.92 bushels in favour of slag. It is reasonable, however, to expect that the degree of effectiveness of the various brands of slag used in this experiment will be manifested to a greater extent in the crops of the second and third years of the rotation.

## POULTRY

The increased demand for literature on poultry breeding, feeding and housing would indicate that poultry keeping is on the increase. A great many of these requests have come from beginners. When enquiries are received for stock, generally speaking, the question is " Where can I get a good bred-to-lay strain?" rather than "What is the best laying breed of hen?" This is indicative of greater interest in poultry breeding.

The results of the contests have shown fairly well that there is more in strain than in breed. For example, at one contest we note Barred Rocks leading; while at another contest White Leghorns are leading; and at still another, the White Wyandottes compose the top pen.

To be successful in poultry raising one must choose the breed he likes best, having due consideration for the market demands, that is whether it is to an egg market alone or to a market for eggs and poultry meat that the breeder wishes to cater. When the choice is made, special attention must be given to the breeding work. Select the highest producing females and mate them with cockerels from the highest producing dams that are available. Give the birds good feed and care, with clean, well-lighted and ventilated houses and satisfactory returns will be realized.

At this Farm, special attention is given to the pedigree breeding work with Barred Plymouth Rocks, the object being to demonstrate the possibilities of establishing a flock with a higher average egg production and, at the same time, maintain a good breed type.

In our pedigree breeding work, all birds are trap-nested, and a definite standard of production is set for the pullet year. All birds laying 175 eggs and conforming to the "Standard of Perfection" are selected, and then mated with good vigorous males from high-producing dams. Each bird's identity is retained by the use of leg and wing bands. Data on feeding, housing, hatching and rearing of poultry are carefully compiled each year.

## PEDIGREE BREEDING

The pullets from this 1919-20 and 1920-21 stock were mass-mated until they had completed their pullet year, then selections were made for the mating season. During the season 1921, nineteen matings were made. The cockerels used were sired by 217-egg birds. During the season of 1922, twenty-four matings were made. The cockerels used in these matings were sired by 217-egg birds and were out of dams with records of 213 eggs and 206 eggs respectively. In 1923, one hundred and two matings were made; of these eight were registered females.

SUMMARY OF PRODUCTION BY YEARS

| Year | Number of birds | Average egg production | Number of birds | Average egg production | Number of birds | Average egg production |
|---|---|---|---|---|---|---|
| 1919-20 | 6 | 208·3 | 4 | 184·0 | 17 | 159·8 |
| 1920-21 | 11 | 218·0 | 13 | 187·1 | 16 | 164·3 |
| 1921-22 | 16 | 218·9 | 8 | 181·4 | 14 | 158·3 |
| 1922-23 | 8 | 275·9 | 19 | 223·3 | 14 | 174·1 |

## HOUSING

A new permanent breeding house is just nearing completion, which will make a valuable addition to the plant. It is 16 by 140 feet, divided into two sections of ten pens with straw loft; each pen being 6 by 16 feet. All partitions are movable and there is a feed room in the centre of the building 16 by 20 feet.

The old permanent house is of the shed-roof type, 16 by 32 feet, divided into two pens with a small straw loft. This house has given very satisfactory results.

Including the contest house, there are twenty-six colony houses 10 by twelve feet on the plant. These houses are divided into two pens holding ten birds each. The colony type of house has many good features. It is not expensive; easily moved to any part of the Farm; and is easily kept clean and sanitary, which is most essential to successful poultry keeping.

HATCHING RESULTS FROM HENS AND PULLETS, 1923

| Ages | Total eggs set | Number fertile | Per cent fertile | Number of chicks | Per cent total eggs hatched | Per cent fertile eggs hatched | Number chicks alive when wing banded | Per cent chicks hatched alive when wing banded | Total eggs required for one chick hatched | Total fertile eggs for one chick hatched | Total eggs required for one chick when wing banded |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Pullets | 3,175 | 2,581 | 81·29 | 702 | 22·11 | 27·19 | 324 | 35·10 | 4·52 | 3·67 | 9·79 |
| Hens | 1,576 | 1,190 | 75·50 | 441 | 27·98 | 37·66 | 299 | 67·80 | 3·57 | 2·69 | 5·27 |
| Total | 4,751 | 3,771 | 79·37 | 1,143 | 24·05 | 30·31 | 623 | 54·50 | 4·15 | 3·29 | 7·62 |

NOTE.—In the preceding table the figures show a difference of 0·98 eggs in favour of hens in number of eggs required to produce one chick when hatched and a difference of 4·52 eggs to produce one chick when wing-banded.

## FEEDING EXPERIMENTS

### BEEF SCRAP VERSUS SKIM-MILK

The object of this experiment was to determine the value of beef scrap versus skim-milk when added to the laying ration. The pens were made up of ten birds each, as uniform in breeding and type as it was possible to select them.

Pen No. 1 received beef scrap not only in the dry mash but in the hoppers which were before the birds at all times. The following rations were fed from November 16, 1922, to April 30, 1923: Grain mixture: 100 pounds wheat, 100 pounds corn, 50 pounds oats, 50 pounds barley. Dry mash: 100 pounds bran, 100 pounds middlings, 100 pounds corn meal, 100 pounds crushed oats, 50 pounds oilcake, 50 pounds beef scrap, 50 pounds blood meal and 15 pounds charcoal.

Pen No. 2 received the same grain and mash mixture with beef scrap and blood meal left out and were treated in the same way except that they received skim-milk without water in place of beef scrap.

The average result of two years would realize $1.64 per hundred pounds for skim-milk when marketed through the egg. The past year's returns are not as great as for the previous year because the hens did not receive water, consquently they consumed nearly three times the quantity of milk, which naturally brought up the cost of feed. Valuing skim-milk at 20 cents per hundred weight and beef scrap at what it costs on the market, $7.48 per hundred weight, the results show that $1.61 worth of milk produced better results than $3.07 worth of beef scrap.

### HOME-MIXED VERSUS COMMERCIAL FEEDS

A feeding test has been conducted during the six winter months for the past two winters. Two pens of ten birds each were used during 1922-23. These birds were either full sisters or half-sisters and as uniform as it was possible to select them. The following rations were fed to pen No. 3: Grain: 100 pounds wheat, 100 pounds corn, 50 pounds oats, 50 pounds barley, fed as scratch feed in the litter. Dry mash: 100 pounds bran, 100 pounds middlings, 100 pounds cornmeal, 100 pounds crushed oats, 50 pounds oilcake, 50 pounds beef scrap, 50 pounds blood meal and 15 pounds charcoal fed in hopper and before the birds at all times. These mixtures cost $2.11 and $2.59 respectively. Pen No. 4 was fed on a commercial scratch grain which cost $2.75 per hundredweight and a commercial dry mash mixture costing $3.75 per hundredweight. Grit, shell and mangels were fed alike to both pens.

Profit over cost of feed, per bird on the home-mixed feed was $1.61 and on the commercial feed, $1.50.

### METHODS OF FEEDING

The practice is to feed the grain mixture in the litter twice daily. The dry mash, beef scrap and charcoal are fed from hoppers. These are before the birds at all times. Green feed is given each day in the form of cabbages, mangels. turnips or sprouted oats. After the season for cabbage and mangels is past, oats are sprouted and fed until the birds can get out on the grass. During the winter months when the weather is very cold, a moist mash is given at noon. This mash should not be made sloppy, but just moistened sufficiently to make it crumbly. If there are any small potatoes or even turnips, cook them up and mix them with the moistened mash. It makes a palatable dish. There are two phases to the feeding work that must be considered: (1) What grain or dry mash mixtures are best suited for winter production? (2) Are these available at reasonable

feeding prices? The grain mixtures used at this Farm during 1922-23 consisted of 100 pounds wheat, 100 pounds corn, 50 pounds oats and 50 pounds barley. This mixture was fed from November 1, 1922, to August 31, 1923, and from September 1 to October 31, 1923, equal parts by weight of wheat, corn and oats were fed. The dry mash mixture consisted of 100 pounds bran, 100 pounds middlings, 100 pounds cornmeal, 100 pounds crushed oats, 50 pounds oilcake, 50 pounds beef scrap, 50 pounds blood meal and 15 pounds charcoal. This mixture was fed from November 1, 1922, to August 31, 1923. For September and October, the following mixture was fed: 100 pounds bran, 100 pounds middlings, 100 pounds cornmeal, 50 pounds oilcake, 50 pounds blood meal, 50 pounds bone meal and 15 pounds charcoal.

### WINTER PRODUCTION

Winter is the season of the year when the expenses are highest, but bear in mind that strictly fresh eggs, in winter, always sell at good prices. There should be no difficulty in having pullets laying by November 1 if hatched in April.

Pullets to the number of 98·8 showed a monthly profit per bird for each month in the year except for November. These profits ranged from 8 cents to 38 cents per bird per month over cost of feed. The average profit over feed cost for the year was $2.19 per bird.

### EARLY VERSUS LATE HATCHED PULLETS FOR WINTER PRODUCTION

The accompanying tables give a fair comparison of what may be expected from early versus late hatched chicks. From these results it will be noted that the early-hatched chicks gave an average profit over feed cost for the four winter months of 53·9 cents per bird, while the late May chicks gave an average profit over feed cost of 9·8 cents per bird, showing a difference of 44·1 cents per bird in favour of the early-hatched ones.

PRODUCTION OF BARRED ROCK PULLETS, NOVEMBER 1, 1922, TO FEBRUARY 28, 1923
Hatched April 15, 1922

| Month | Number of birds | Total pounds of feed | Total cost of feed | Total number of eggs | Selling price | Value | Profit over cost of feed | Loss | Cost per bird | Eggs per bird | Cost per dozen | Profit per bird |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | $ cts. | | cts. | $ cts. | $ cts. | $ cts. | cts. | | cts. | cts. |
| November | 58 | 583·0 | 10 22 | 453 | 45 | 16 99 | 6 76 | ..... | 18 | 7·8 | 27 | 11·6 |
| December | 57 | 655·0 | 10 52 | 579 | 50 | 24 12 | 13 60 | ..... | 18 | 10·1 | 22 | 23·8 |
| January | 53 | 542·0 | 9 78 | 430 | 50 | 17 92 | 8 14 | ..... | 18 | 8·1 | 27 | 15·3 |
| February | 42 | 479·5 | 8 49 | 237 | 50 | 9 87 | 1 38 | ..... | 20 | 5·6 | 43 | 3·2 |

Average number of birds, 52·5.
Total number of eggs laid, 1,699.
Total cost of feed, $39.02.

Total value of eggs, $68.91.
Profit over cost of feed, $29.89.
Number of eggs per bird, 31·6.

Cost per bird, 74 cents.
Cost of eggs per dozen, 27½ cents.
Profit over feed cost per bird, 53·9 cents.

PRODUCTION OF BARRED ROCK PULLETS, NOVEMBER 15, 1922, TO FEBRUARY 28, 1923
Hatched May 28, 1922

| Month | Number of birds | Total pounds of feed | Total cost of feed | Total number of eggs | Selling price | Value | Profit over cost of feed | Loss | Cost per bird | Eggs per bird | Cost per dozen | Profit per bird |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | $ cts. | | cts. | $ cts. | $ cts. | $ cts. | cts. | | cts. | cts. |
| November and December | 48 | 554 | 8 88 | 144 | 50 | 6 00 | ..... | 2 88 | 18½ | 3·0 | 74 | 6·0 |
| January | 45 | 535 | 10 29 | 247 | 50 | 10 29 | ..... | ..... | 23 | 5·3 | 50 | ..... |
| February | 35 | 399 | 7 49 | 313 | 50 | 13 04 | 5 55 | ..... | 21 | 8·9 | 29 | 15·8 |

Average number of birds, 42·6.
Total number of eggs laid, 704.
Total cost of feed, $26.66.

Total value of eggs, $29.33.
Profit over cost of feed, $2.67.
Average number of eggs per bird, 17·2.

Cost per bird, 62½ cents.
Cost of eggs per dozen, 45 cents.
Profit over feed cost per bird, 9·8 cents.

COST OF PRODUCING CHICKS

The following is a summary per period with the total and average cost to rear chicks to five months of age. All period averages are taken on the number of chicks alive at the end of the period:—

| —— | Totals | Average per chick alive per period |
|---|---|---|
| | $ | $ |
| Incubation period, April, 428 chicks | 79·440 | 0·185 |
| Brooder period, April, 130 chicks | 35·055 | 0·269 |
| Incubation period, May, 715 chicks | 73·700 | 0·100 |
| Brooder period, May, 407 chicks | 33·490 | 0·080 |
| Range cost for July, 526 chicks | 80·960 | 0·150 |
| Total cost end of July, 526 chicks | $302·645 | $ 0·554 |
| Range cost of 93 early pullets— | | |
| August | $ 10·160 | $ 0·109 |
| September | 16·275 | 0·175 |
| Range cost of 100 mid-season hatched pullets— | | |
| August | 8·35 | 0·0835 |
| September | 18·00 | 0·1800 |
| Range cost of 61 late hatched pullets— | | |
| August | 7·77 | 0·127 |
| September | 13·07 | 0·214 |
| Range cost of 76 cockerels— | | |
| August | 6·85 | 0·09 |
| September | 10·12 | 0·13 |
| Total cost for 330 birds, 2 months | $ 90·595 | $ 0·275 |
| Total cost for 330 birds, 5 months | 273·415 | 0·829 |

## EGG LAYING CONTEST

The fourth Egg Laying Contest was completed on October 31, 1923. There were twenty entries of ten birds each, making a total of 200 birds. Out of the 200 birds entered, 31 qualified for registration by laying over 200 eggs within the fifty-two weeks. The demand is increasing each year for bred-to-lay stock. Twenty-five pedigree cockerels were sent out from this Farm during the fall of 1923.

The contest birds are housed in comfortable, shed-roofed houses, 10 by 12 feet. These houses are divided in two pens by a solid wood partition. Nearly two-thirds of the fronts are glass and curtains, thus affording plenty of fresh air and sunlight for the birds. Each pen is provided with hoppers for grit, shell, charcoal, beef scrap and dry mash.

A complete record is kept of each individual production. The quantities of feed consumed by each pen is weighed carefully at the beginning and end of each four week period. Close attention is given to the health and feed requirements of the birds.

The feed mixtures used for 1922 and 1923 were as follows: Grain mixture consisting of 100 pounds wheat, 100 pounds corn, 50 pounds oats, 50 pounds barley: dry mash consisting of 100 pounds bran, 100 pounds middlings, 100 pounds crushed oats, 100 pounds cornmeal, 50 pounds oilmeal, 50 pounds beef scrap, 50 pounds blood meal and 15 pounds charcoal. These mixtures were used from November 1, 1922, to September 4, 1923. From September 4 to October 30, the 50 pounds of barley was replaced by 50 pounds of oats; and in the dry mash the 100 pounds of crushed oats were dropped and 50 pounds of bone meal added. The green feed during the winter consisted of mangels, and sprouted oats were used during the spring months. Plenty of good fresh water is supplied each day to the pens.

Individual and pen records are sent out each week to the contestants, and on application, to any person who is interested.

Substitutes are allowed in case of death, thus enabling the strength of the pens to be kept up. All birds laying 200 eggs which weigh 24 ounces to the dozen are eligible for registration, provided that they are free from standard disqualifications.

The leading pen at the close of the contest was No. 3, Barred Rocks, owned by Rupert Bligh & Sons, Lakeville, N.S., with a total of 1,915 eggs, or an average of 191.5 eggs per bird. This pen for the week ending May 1, 1923, laid 68 eggs and again for the week ending October 2, 68 eggs, only two eggs short of 100 per cent production. This pen also contains a pullet, No. 38, which laid 106 eggs in 106 consecutive days, from April 14 to July 28. This is the highest record made by a Barred Rock in Canada and possibly in the United States.

The second highest pen was No. 2, Barred Rocks, owned by Lawson Lowe, Amherst, N.S., with 1,814 eggs, or an average of 181.4 eggs per bird. The third highest pen was No. 8, Barred Rocks, owned by Mrs. John J. Simpson, Wallace Bridge, N.S., with 1,805 eggs, or an average of 180.5 eggs per bird.

The new breeding house erected on the poultry plant at the Experimental Farm, Nappan, N.S.

Pen No. 7, owned by F. S. Black, Amherst, N.S., would probably have stood in fourth or fifth position if the pen had been kept up to the full strength, but owing to a misunderstanding no birds were substituted in this pen. The seven birds that completed the year had an average production of 184 eggs per bird, one bird in the pen laying 233 eggs.

Out of 200 birds in the contest, 12 birds laid 225 eggs and over, 20 laid 200 and under 225 eggs, 25 laid over 175 but less than 200 eggs, 32 laid 150 and over but less than 175 eggs and 111 were under the 150 egg mark.

It is interesting to note that there has been a gradual increase in production each year from the contest. The following figures give the average production for the four contest years:

| | Number of birds | Average production |
|---|---|---|
| Contest year— | | eggs |
| 1919–20 | 200 | 121·1 |
| 1920–21 | 220 | 127·8 |
| 1921–22 | 200 | 138·3 |
| 1922–23 | 200 | 143·3 |

## BEES

The season of 1923 was a very successful year for bee-keeping. The winter of 1922-23 was cold with a continuous covering of snow, which remained on the fields late in the spring. This covering of snow protected the clover plants and resulted in an excellent stand of clover which supplied an abundance of good pasturage throughout the entire season. The clover aftermath was exceptionally good, providing pasturage much later in the season than usual. The first examination was made on April 19, 1923. This revealed the loss of two colonies, leaving twenty colonies with an average strength of 5.6 frames covered with bees. The spring was late and cold and it was necessary to feed a few colonies for which frames of late honey were used. Very little honey was gathered during May and June, but the production for July, August and early September was good.

The total extracted honey for the season was 2,295 pounds. Seventeen of the wintered colonies produced 2,217 pounds of the total. The highest production recorded from one colony was 212.5 pounds, while the lowest of the seventeen old colonies was 60 pounds. One colony produced 183 pounds honey and nuclei for three new hives. One hundred per cent of the total production would grade clover honey.

### WINTERING, 1923

All colonies were fed sugar syrup, made up of two parts sugar to one water by weight. This operation was completed on October 28, 1923. Miller feeders were used. All colonies were packed with shavings in two-colony wintering cases on November 16. These cases are large enough for two colonies, leaving approximately four inches of shavings on the bottom and sides with nine inches on top. This method of wintering has proven very satisfactory.

### FINANCIAL STATEMENT

| | | |
|---|---|---|
| To 2,295 pounds extracted honey at 20 cents | ..... | $ 459 00 |
| To 8 colonies increase at $7 | ..... | 56 00 |
| By 350 pounds sugar fed at 11 cents | $ 38 50 | ..... |
| By 6 colonies united at $7 | 42 00 | ..... |
| By 4 colonies died at $7 | 28 00 | ..... |
| By 527½ hours labour at 28 cents | 147 70 | ..... |
| By Profit | 258 80 | ..... |
| | $ 515 00 | $ 515 00 |

## FIBRE DIVISION

Nineteen fortieth-acre plots of flax and two of Clington hemp were planted in 1923.

Tests were made in duplicate plots of five varieties, and extra plots of the standard variety, Riga Blue, were sown and an experiment started with dates of sowing flax.

The variety Pure Line No. 5 proved the best, with Pure Line No. 3 second and Riga Blue third in total weight per acre; but Saginaw and Longstem went ahead of the latter in yield of fibre.

Four weekly sowings were made of Riga Blue, starting on May 29. The yields of the first two are given in the table, while the later sowings did not mature sufficiently well for curing.

Hemp made good growth and the yields were very satisfactory. The fibre from the above plots is of number one quality and strength, and more attention will be paid another year to the growing of this valuable product.

FIBRE EXPERIMENTS

| Variety | Weight of straw per acre | Average weight per acre | Yield of seed per acre | Yield of fibre per acre | Average yield | Yield of tow per acre | Average yield |
|---|---|---|---|---|---|---|---|
| | | | bush. | | | | |
| Pure Line No. 5 | 8,000<br>6,540 | 7,270 | 17·9 | 500<br>460 | 480 | 360<br>400 | 380 |
| Pure Line No. 3 | 6,420<br>6,220 | 6,320 | 11·6 | 400<br>400 | 400 | 380<br>280 | 330 |
| Saginaw | 3,580<br>3,560 | 3,570 | 8·57 | 340<br>220 | 290 | 220<br>200 | 210 |
| Longstem | 2,960<br>4,240 | 3,600 | 9·64 | 240<br>340 | 290 | 160<br>240 | 200 |
| First sowing Riga Blue plots, May 29 | 4,440<br>6,140 | | | 280<br>480 | | 220<br>340 | |
| | 2,700<br>6,500 | 4,244 | 12·5 | 160<br>360 | 268 | 240<br>600 | 308 |
| | 1,440 | | | 60 | | 140 | |
| Second sowing, June 5 | 3,140<br>4,860 | 4,000 | 10·35 | 200<br>300 | 250 | 240<br>380 | 310 |
| Hemp | 10,140 | ..... | ..... | 750 | ..... | ..... | 600 |

## MISCELLANEOUS

Six to seven acres of stump land northeast of the boarding-house were cleared and seeded down with a crop of mixed grain. Although late in the season when the seeding was finished, this field gave an average yield of over 40 bushels to the acre.

Our records show more visitors at the Farm this year than in any of the previous years.

Many agricultural meetings were attended by the staff, who also acted as judges at a number of fairs and ploughing matches. Exhibits were arranged for a number of fairs and live stock from the Farm was shown to advantage at the Royal Agricultural Winter Fair and the Amherst Winter Fair.

## EXPERIMENTAL PROJECTS UNDER WAY AT THE EXPERIMENTAL FARM, NAPPAN, N.S.

### ANIMAL HUSBANDRY

#### BEEF CATTLE

A. 171. Roots vs. ensilage for steer feeding.
A. 179. Cost of beef production for steers of different ages.
A. 180. Feeding steers loose vs. tied.
A. 181. Feeding horned vs. dehorned.
A. 182. Limited growing vs. full fattening ration for steers.
A. 185. Feeding choice vs. inferior steers.
A. 190. Cost of rearing beef bred calves and heifers.
A. 191. Establishing herds of beef cattle.
A. 194. Economy of steef feeding.
A. 240. Indoors vs. outdoors feeding of steers.
A. 270. Economy of feeding light vs. heavy steers.
A. 433. Marsh hay (broadleaf) vs. mixed hay for steer feeding.
A. 434. Influence of dehorning on gains made by steers.

HORSES

A. 294. Cost of rearing horses.
A. 340. Control of joint ill in foals.

DAIRY CATTLE

A. 13. Corn ensilage vs. sunflower ensilage for milch cows.
A. 56. Cost of milk production.
A. 59. Cost of rearing dairy bred calves and heifers.
A. 204. Grading up dairy herd.
A. 216. Establishing herds of dairy cattle.
A. 268. Value of mineral matter for dairy cows.
A. 360. Value of keeping herd records.
A. 395. Ensilage vs. turnips for milch cows.
A. 397. Value of dehorning milch cows and heifers.
A. 435. Value of bone meal for dairy-bred calves.

SWINE

A. 106. Meal vs. meal and green feed for summer feeding.
A. 135. Comparison of corn vs. barley.
A. 143. Value of skim-milk for hogs.
A. 146. Inside vs. outside feeding in summer.
A. 156. Comparison of breeds of swine and crosses in feeding characteristics.
A. 158. Cost of maintaining brood sows.
A. 160. Cost of rearing pigs to weaning.
A. 163. Cost of bacon production.
A. 234. Establishing a herd of bacon swine.
A. 362. Buckwheat vs. shorts.
A. 363. Buckwheat vs. cornmeal.
A. 364. Buckwheat vs. crushed oats and pea meal.
A. 365. Shorts vs. cornmeal.
A. 366. Shorts vs. pea meal and crushed oats.
A. 367. Cornmeal vs. crushed oats and pea meal.
A. 436. Cost of pork production under summer vs. winter conditions.
A. 437. The prenatal influence of feeding and housing on the litter.

SHEEP

A. 310. Grading up the flock with pure-bred rams.
A. 313. Improved methods of breeding pure-bred sheep.
A. 368. Clover vs. timothy hay for lamb feeding.
A. 369. Value of roots for lamb feeding.
A. 370. Succulent roughages vs. dry roughages for lamb feeding.

## FIELD HUSBANDRY

ROTATION EXPERIMENTS

F. 3. Three-year rotation—Roots; oats; clover.
F. 12. Four-year rotation—Roots; oats; clover; timothy.
F. 15. Four-year rotation—Corn, sunflowers, turnips and O.P.V.; oats; clover; timothy.
F. 18. Four-year rotation—Oats; clover; timothy; timothy.
F. 33. Five-year rotation—Roots; wheat; oats; clover; timothy.
F. 35. Five-year rotation—Oats; clover; timothy; timothy; timothy.

CULTURAL EXPERIMENTS

F. 48. Preparation of land for grain.
F. 49. Preparation of land for silage crops.
F. 50. Preparation of land for root and potato crops.
F. 52. Depth of ploughing.
F. 55. Dates of seeding silage crops.
F. 61. Rates of seeding and kinds of nurse crops.
F. 62. Distance between rows of sunflowers and plants in row.
F. 67. Pasture renovation.
F. 72. Tile-drained vs. undrained land.
F. 73. Depths and distances apart of underdrains.
F. 94. Renewing marsh lands.

MANURE AND COMMERCIAL FERTILIZER EXPERIMENTS

F. 76. Quantities of manure and place in rotation of applying manure.
F. 77. Methods of applying manure.
F. 78. Green manure crops.
F. 81. Commercial fertilizers for hay.

FARM MANAGEMENT EXPERIMENTS

F. 88. Yield and profit from root and silage crops.
F. 90. Cost of operating tractor.
F. 91. Cost of producing farm crops.

## HORTICULTURE

POMOLOGY

H. 4. Currant variety experiment.
H. 6. Gooseberry, variety experiment.
H. 11. Raspberry, variety experiment.
H. 21. Strawberry, variety experiment.
H. 33. Apple, variety experiment.
H. 35. Cherry, variety experiment.
H. 44. Pear, variety experiment.
H. 48. Plum, variety experiment.
H. 30. Orchards, cost of establishing.

VEGETABLE GARDENING

H. 54. Asparagus, variety experiment.
H. 57. Bean of different seasons vs. one variety planted at different dates.
H. 61. Bean, bush variety experiment.
H. 67. Beet, thinning experiment.
H. 68. Beet, variety experiment.
H. 70. Brussel sprouts, variety experiment.
H. 77. Cabbage, variety experiment.
H. 82. Carrot, thinning experiment.
H. 83. Carrot, variety experiment.
H. 88. Cauliflower, variety experiment.
H. 94. Celery, variety experiment.
H. 309. Citron, variety experiment.
H. 102. Corn, variety experiment.
H. 106. Cucumber, variety experiment.
H. 116. Lettuce, variety experiment.
H. 122. Melon, Musk, variety experiment.
H. 125. Melon, Water, variety experiment.
H. 138. Onion, variety experiment.
H. 144. Parsnip, thinning experiment.
H. 145. Parsnip, variety experiment.
H. 150. Pea of different seasons vs. one variety planted at different dates.
H. 153. Pea, variety experiment.
H. 160. Potato, cost of producing.
H. 164. Potato, different sizes of sets.
H. 165. Potato, distances of planting.
H. 168. Potato, growing certified seed.
H. 186. Potato, variety experiment.
H. 188. Pumpkin, variety experiment.
H. 192. Radish, variety experiment.
H. 201. Squash, variety experiment.
H. 207. Tomato, methods of training.
H. 211. Tomato, variety experiment.

ORNAMENTAL GARDENING

H. 261. Annual flowers, variety experiment.
H. 274. Perennial flowers, variety experiment.

## CEREALS

Ce. 1. Wheat, test of varieties or strains.
Ce. 5. Oats, test of varieties or strains.
Ce. 6. Barley, test of varieties or strains.
Ce. 12. Buckwheat, test of varieties or strains.
Ce. 50. Cereals, mutliplication of.
Ce. 60. Tests of barleys and oats in combination for grain.
Ce. 61. Tests of barley, oats and wheat in combination for grain.

## FORAGE PLANTS

Ag. 1. Indian Corn, variety tests for ensilage purposes.
Ag. 16. Mangels, variety tests for yield and purity.
Ag. 36. Carrots, variety tests for yield and purity.
Ag. 51. Swedes, variety tests for yield and purity.
Ag. 55. Swedes, testing clubroot resistant varieties.
Ag. 58. Swedes, seed production as a commercial venture.
Ag. 66. Sugar Beets, variety tests for yield and purity.
Ag. 76. Sunflowers, variety tests for yield and purity.
Ag. 126. Alfalfa, variety tests, hardiness, yield, suitability.
Ag. 129. Alfalfa, broadcast vs. rows for hay production.
Ag. 133. Alfalfa, seeding with vs. without a nurse crop for seed production.
Ag. 146. Red Clover, variety tests for yield and general suitability.
Ag. 161. Sweet Clover, variety tests.
Ag. 201. Timothy, variety tests for yield and purity.
Ag. 231. White Dutch Clover, variety tests for yield and suitability.
Ag. 258. Hay and Pasture Mixtures Experiments—
(*d*) Red clover as a base.
(*g*) Grasses and clovers alone, and in combination.

## CHEMISTRY

C. 8. Fertilizer formulæ for potatoes experiments, 1922.
C. 26. Basic slag experiment, 1923.
C. 10. Sugar beet investigation.
C. 11. Agricultural meteorology.
C. 78. Ground limestone vs. basic slag, 1922.

## POULTRY

P. 1. Best make of incubator (Prairie State-Cyphers, Tamlin).
P. 3. Best date for incubation.
P. 12. Hatching results by breed (B.R.—W.L.).
P. 22. Brooding costs.
P. 24. Best type of colony house.
P. 31. Rearing costs.
P. 56. Pedigree breeding for egg production.
P. 62. Costs of egg production—
(*b*) Winter eggs.
(*c*) Yearly.
P. 64. Egg laying contest.
P. 66. Best type of laying house.
P. 76. Standard (home-mixed) vs. commercial grain.
P. 79. Standard (home-mixed) vs. commercial mashes.
P. 82. Skim-milk vs. beef scrap.
P. 111. Breeding for fertility and hatchability.
(*a*) Hens vs. Pullets.

## APIARY

Ap. 1. Control of swarming by dequeening and requeening.
Ap. 9. Wintering in two-colony cases.
Ap. 12. Two-queen system.
Ap. 20. Returns from apiaries.
Ap. 21. Comparison of different sizes of hives.
Ap. 28. Study of honey flows.

## FIBRE PLANTS

E. 3. Testing varieties of flax.
E. 4. Testing varieties of hemp.
E. 7. Seeding tests, sowing flax at different dates.

OTTAWA: Printed by F. A. ACLAND, Printer to the King's Most Excellent Majesty, 1924.