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## Mardella Shorthorns

Dual purpose bulls, 20 young cows and heifers  
—bred, some calves by side. Size, type, quality,  
some full of Scotch. The great, massive Duke,  
dam gave 13,599 lbs. milk, 474 lbs. butter-fat,  
at the head.

**THOMAS GRAHAM**  
Port Perry, R. 3, Ontario

## Evergreen Hill R.O.P. Shorthorns

Herd headed by the R.O.P. bull, St. Clare.  
Nothing for sale at present.  
S. W. Jackson, R.R. No. 4, Woodstock, Ont.

**Bulls** all sold. One extra good roan bull calf  
by an R.O.P. dam with an average test  
of 4.5; he would work by July. Also a few females  
bred to the herd sire, Royal Choice 79864.  
Leicester rams and Yorkshire sows. C.P.R., G.T.R.  
**ALLAN B. MANN, "The Hawthornes,"**  
Peterboro, R.R. 4.

**Plaster Hill Herd** Dual-Purpose Shorthorns.  
Six young bulls from four to  
thirteen months. Size, quality and good milking  
strains.  
**F. Martindale & Son, R.R. 3, Caledonia, Ont.**

**Spruce Lodge Shorthorns and Leicesters**  
Herd headed by the Butterfly-bred bull, Roan  
Chief Imp. = 60865 =. Young bulls, cows, and  
heifers of all ages, of good breeding and quality.  
**W. A. DOUGLAS, CALEDONIA, ONTARIO**

**GLENFOYLE SHORTHORNS**  
College Duke 4th in service — a high record son  
of Rothschild and Taylor's noted stock. Am  
offering young cows and heifers, bred to this great  
bull. Have a few bulls of breeding age on hand.  
**Stewart M. Graham, Lindsay, Ontario**

Please Mention Farmer's Advocate

## A Good Water Filter.

EDITOR "THE FARMER'S ADVOCATE":

When water is to be filtered, the chief  
problem is how to construct the most  
efficient filter. A properly constructed  
sand filter will remove practically all  
of the disease-producing bacteria. In  
order to construct an efficient filter, it  
is necessary to understand something of  
the theory on which it operates. Since  
bacteria are so small, that several billions  
could be placed in one cubic inch, it is  
ridiculous to suppose that they are held  
mechanically in the pores of the sand,  
or any other material that will allow the  
flow of water.

The explanation of the removal of  
the bacteria by a filter lies in the fact that  
there are certain classes of harmless  
bacteria, which destroy the harmful ones  
that produce disease.

These helpful water bacteria propagate  
rapidly in the filter, especially in the  
upper layers, collecting in the form of a  
slimy deposit on the surface. The  
dangerous bacteria are attacked as they  
enter this part of the filter, and are rapidly  
destroyed. The function of the lower  
layers of the filter is chiefly to remove  
these slimy, surface bacteria from the  
water, and so make it more palatable.

Particles of soil and other suspended  
matter may be removed in the upper  
layers of the filter, but it is better to let  
the greater part of such material settle out  
in a separate basin, because it soon clogs  
the filter. The vegetable matter, which  
causes bad tastes and odors, is usually  
fairly well-removed in a sand filter  
through oxidation.

### Sand Important in Filtering.

In the construction of a filter the sand  
is the most important element, since it  
regulates the rate of flow. The rate of  
flow determines the thoroughness of the  
bacterial action, and this fixes the effi-  
ciency of the filter. The rate of filtra-  
tion increases with an increase in the  
size of the sand, and vice versa. It has  
been found that a sand of which about  
ten per cent. is three-tenths to four-  
tenths of a millimeter, or one-sixtieth  
to one-ninetieth of an inch in size gives  
the best results. The sand should be  
very clean and free from any large or  
very small particles, although it is not  
absolutely necessary that it be uniform  
in size.

Another important feature is the depth  
or distance through which the water  
filters. Of course, the depth also in-  
fluences the rate of filtration, and a small  
depth does not hold the water long enough  
for efficient bacterial action. The depth  
of the sand should be, at least, three feet,  
and preferably four or five feet. There  
is no danger of having too much sand,  
except as it lowers the rate of filtration,  
and, therefore, filters are sometimes made  
so that water will run through them  
horizontally for a distance of ten or twelve  
feet.

The remaining factor affecting the flow  
is the head, or the depth of water above  
the sand. As the head increases the  
rate of flow increases, although not pro-  
portionally. The large filter plants for  
city water supplies usually operate under  
heads of from four to six feet, but a small  
plant would operate as efficiently under  
much less head. For a filter of three feet  
depth two feet of head should be ample and  
less might be used, if only a slow rate of  
filtration is desirable. It is a good rule  
to make the head at least as great as the  
depth of sand. If this is impracticable,  
a smaller head may be used, but the rate  
of filtration will be greatly lowered.

### Area of Filter Bed.

The size of the filter, aside from the  
depth, depends upon the amount of water  
to be filtered. For a given quantity of  
water passing through a filter with a  
given size of sand, with a fixed depth  
operating under a certain head, the  
amount of area for the bed is easily de-  
termined. Under high heads, as much as  
eight million gallons per acre of sand is  
filtered per day, but if under heads of  
from four to six feet, ordinarily used,  
three million gallons per acre per day is  
considered a safe rate. This latter is  
equivalent to about 65 gallons per day  
per square foot of area. Knowing the  
amount of water required to be filtered  
per day the area of filter required is easily  
determined by dividing the quantity to  
be filtered by the quantity filtered by one  
square foot, and knowing the area re-  
quired the length and breadth can be  
arranged. For smaller heads than those

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## BLAIRGOWRIE SHORTHORNS

I have females all ages and bulls of serviceable age. Worth while to come and see or write  
**JOHN MILLER** Myrtle Station, C.P.R., G.T.R. ASHBURN, ONTARIO

## GLENGOW SHORTHORNS

We have a choice offering in young bulls, fit for service. They are all of pure Scotch breeding  
and are thick, mellow fellows, bred in the purple.  
**WM. SMITH, COLUMBUS, ONTARIO.** Myrtle, C.P.R., Brooklyn, G.T.R., Oshawa, C.N.R.

## Robert Miller, Stouffville, Ontario

still has a few Shorthorn bulls, fit for service, and some females that are as good as can be found for  
the man that wants to start right in Scotch Shorthorns. They will be sold for a low price, considering  
the quality, and the freight will be paid.  
Write for anything in Shorthorns. One hour from Toronto

**SEVENTY-THREE HEAD OF SHORTHORNS**  
Four good young bulls of serviceable age; Nonpareil Ramsden = 101081 = and Royal Red Blood  
= 77521 =, at the head of the herd. These young bulls range in age from 8 to 15 months, and are for  
immediate sale. They are out of good dams, which will bear inspection. Our cows and heifers will  
please, and you'll like the bulls. Also three extra-good grade heifers, from heavy milk-producing dams.  
**James McPherson & Sons, Dundalk, Ontario**

## SPRING VALLEY SHORTHORNS

Herd of seventy head, straight Scotch, good individuals. Headed by the great show and breeding bull,  
Sea Gem's Pride 96365, and Nonpareil Ramsden 83422. We have for sale four as good young bulls as  
we ever had, and a few females. **KYLE BROS., Drumbo, Ont.** (Phone and telegraph via Ayr.)

**FAIRVIEW SHORTHORNS AND CLYDESDALES**  
In Shorthorns we can offer you a choice from 60 head, including both bulls and females, of Lavender,  
Missie, Augusta Duchess of Gloster, Village Girl, Miss Ramsden and Clara breeding—the best of  
cattle and the best of pedigrees. In Clydesdales, write for our list of winners at Toronto, London and  
Guelph 1917 shows, Canadian-bred classes. We also have a nice offering in Shropshires.  
**ROBERT DUFF & SONS** Myrtle Station, C. P. R. and G. T. R. **MYRTLE, ONT.**

**SHORTHORNS**—T. L. MERCER, Markdale, Ontario — ROSEWOOD  
CHAMPION, by Nonpareil Archer, Imp., at the head of  
the herd. I have almost 100 Shorthorns in my stables at  
present. Marr Missies, Campbell-bred Claretts, Nonpareils, Minas, Rosemarys, etc.—the best of  
breeding and the best of cattle; bulls or females; also have a few Herefords.

**Dual-Purpose Shorthorns**—CROWN JEWEL still heads the herd. Present  
offering is 5 bulls, from 13 to 18 months. Prices  
from \$200 to \$250. Also some good breeding  
females, either bred or with calf at foot. All registered and priced to sell.  
**JNO. ELDER, Hensall, Ontario**

## MAPLE HALL - SHORTHORNS

Present offering, 7 yearling bulls:  
One Cruickshank Duchess of Gloster Five Cruickshank Butterflies One Shepherd Rosemary  
All pure Scotch, and extra good; also a few young cows with calves, and yearling heifers.  
**D. BIRRELL & SON, CLAREMONT, ONT.**

## PLEASANT VALLEY FARMS

Present offering—A number of good young Scotch cows with calves at foot and rebred to (Imp.)  
Newton Grand Champion; also a number of 2-year-old heifers bred to same sire. Suitable for good  
herd foundations; priced to move them. Inspection invited.  
**GEO. AMOS & SONS, Farm 11 miles east of Guelph, C.P.R. MOFFAT ONTARIO**

## IMPORTED SCOTCH SHORTHORNS

Our present offering includes 100 imported females and 12 young imported bulls, representing the most  
desirable lines of breeding. If interested come and see them. Burlington Jct., G.T.R., is only half  
mile from farm. **J. A. & H. M. PETTIT, FREEMAN, ONTARIO.**

## ESCANA FARM SHORTHORNS

Five Bulls for Sale. One roan senior yearling; one choice twelve months white calf, by Right Sort  
(Imp.); one select, dark roan, ten months calf; one roan yearling, by Raphael (Imp.); one red roan  
yearling, for grade herd. Farm ¼ mile from Burlington Jct., G.T.R.  
**J. F. MITCHELL, Limited BURLINGTON, ONTARIO**

## FIFTY IMPORTED SHORTHORNS

I have fifty head of newly imported Shorthorns (42 females, 8 bulls) which are acknowledged to be one  
of the strongest lots that have left Britain this season. You should see these if you are wanting some  
thing choice.  
**GEORGE ISAAC, (All Railroads: Bell Phone) COBOURG, ONTARIO**