

640 ACRES, MORE OR LESS

Farmland in western Canada was surveyed during the 1800's using several survey systems. When the first settlers came, they settled along the rivers. The land was divided into long, narrow "river lots", each with river frontage. The size of these lots varied greatly.

Later surveys divided the remaining land, as nearly as possible, into sections about one mile square. Because the earth is a sphere, it is impossible to divide its surface into square sections all of the same size. The surveying equipment of the 1800's, the physical hardships of surveying an uninhabited land (much of it during the winter), and the pressure of getting such a gigantic job done in a short time, led to further inaccuracies and errors. In addition to these problems, the basic survey system was changed five times as the surveys proceeded north and west.

In southern Manitoba, there is a road allowance around each section. Further west and north, there is a road allowance around every two sections. The width of road allowances also varies. Some are 66 feet while others are 99 feet wide.

Several methods, such as the familiar "correction lines", were used to compensate for the curvature of the earth. In some places, the sections in townships south of the baselines were made slightly oversize, and the ones north of the baselines slightly undersize.

In other places, all the sections except those on the west side of a township were made as near as possible to one mile square, and all the corrections placed in the most westerly quarter sections. Where two different survey systems met, fractional townships and ranges were created. As a result, very few sections in western Canada contain exactly 640 acres, and the phrase "more or less" has become a standard part of land titles.

Less than 1% of all the quarter sections in western Canada contain exactly 160 acres. There is one case where two quarter sections, within two miles of each other, have 137 and 194 acres respectively. Fortunately, most quarter sections are much nearer 160 acres. More than half of them are in the range of 157 to 163 acres. The assumption that a quarter section is about 1/2 mile square is accurate enough for farming purposes.

Using 1/2 mile as the length or width of a quarter section is accurate enough for practical purposes; 1/2 mile is 4.7 m (15 ft) longer than 800 m but since most fields have headlands, the length of a cropped field is usually closer to 800 m than 1/2 mile. Therefore, the usual size of a quarter section is 800 m x 800 m.

The metric units of area are the square metre (m²), and the hectare (ha), the hectare is the area of a 100 m square or 10,000 m². A normal quarter section 800 m² therefore has an area of

$$\frac{800 \times 800}{10000} = 64 \text{ ha}$$

Field dimensions can be converted using the following factors:

- 1 foot = 0.3 m
- 1 rod = 5 m
- 1 mile = 1600 m

Example: A field 1/2 mile long by 40 rods wide is 800 m x 200 m.
The area is

$$\frac{800 \times 200}{10000} = 16 \text{ ha}$$

If the area of a field is known in acres, the area in hectares can be obtained, by multiplying by 0.4.

Example: A field of 65 acres is $65 \times 0.4 = 26 \text{ ha}$

An example of how conveniently sections of land may be subdivided, using metric units, is shown in FIGURE 1.

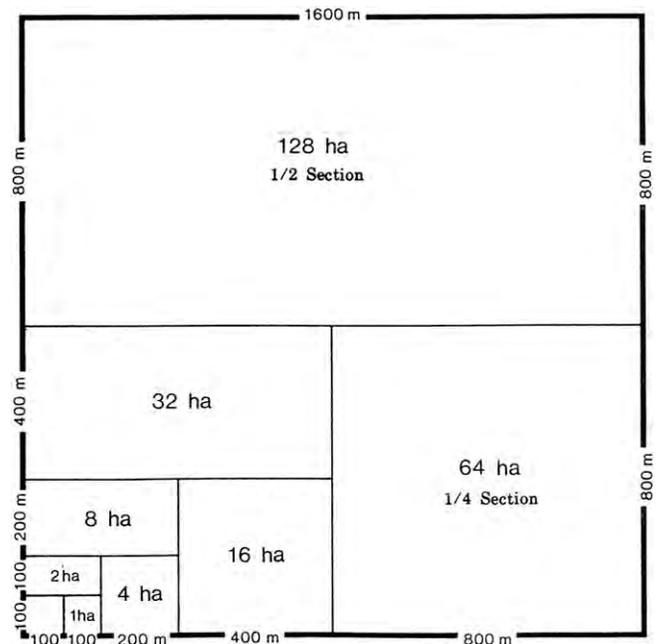


FIGURE 1. Subdivided Section of Farm Land -- Metric Units.

For determining work rates in the field, the following formula is used:

$$\frac{\text{machine width (m)} \times \text{speed (km/h)}}{10} = \text{work rate (ha/h)}$$

Example: A seed drill with a working width of 5 m, operating at an average speed of 8 km/h, has a workrate of $\frac{5 \times 8}{10} = 4$ ha/h.

No changes to fields or equipment are required to use the metric system. Existing dimensions are simply expressed in metres, and areas in hectares. No resurveying is required, no roads need to be moved, and legal land descriptions (quarter-section-township-range) remain unchanged. Existing sections are still 640 acres, more or less. However, those same sections are also 256 ha . . . more or less.

All plans registered at the Land Titles Offices in Alberta and Saskatchewan must be in metric units. The Manitoba Land Titles Office accepts plans in both metric and Imperial units. Surveys in Imperial measure are converted to metric at the Land Titles Office.

O.H. Friesen
Manitoba Agriculture
Winnipeg

J.C. Thauberger
PAMI- Portage



**ALBERTA
FARM
MACHINERY
RESEARCH
CENTRE**

3000 College Drive South
Lethbridge, Alberta, Canada T1K 1L6
Telephone: (403) 329-1212
FAX: (403) 329-5562
<http://www.agric.gov.ab.ca/navigation/engineering/afmrc/index.html>

Prairie Agricultural Machinery Institute

Head Office: P.O. Box 1900, Humboldt, Saskatchewan, Canada S0K 2A0
Telephone: (306) 682-2555

Test Stations:

P.O. Box 1060

Portage la Prairie, Manitoba, Canada R1N 3C5

Telephone: (204) 239-5445

Fax: (204) 239-7124

P.O. Box 1150

Humboldt, Saskatchewan, Canada S0K 2A0

Telephone: (306) 682-5033

Fax: (306) 682-5080