

source of the barberry in the neighborhood of the grain fields. This is what might be expected from a consideration of the fact that by passing a portion of its life on the barberry the rust fungus is invigorated, and its power of producing rust on grain or grasses again multiplied many times over.

THE BARBERRY.

There are several species of barberry grown in Ontario, but not all of them harbour grain rust. The barberry which is most frequently found in Ontario is the Common Barberry (*Berberis vulgaris*). This species and the purple-leaved variety of it do harbour the stem rust.

The Common Barberry (*Berberis vulgaris*, L.) is a native of Europe. It has been much planted in Ontario for ornamental purposes and has become wild in some localities. It is a spiny shrub from six to nine feet high, with yellow wood, arching branches and grey twigs. The leaves are bright green, smooth, somewhat oval, from one to three inches long, the margins with bristly teeth. The flowers are small, yellow, and borne in long drooping clusters (racemes). The berries are oblong, red and sour. (See Fig. 12.) The purple-leaved variety (*Berberis vulgaris*, var. *atropurpurea*, Rgl.) is similar, except that the leaves are dark purple in color. It is now contrary to law to plant the common barberry (*Berberis vulgaris*, L.) in Ontario. (See Act respecting barberry appended.) If barberries are required for ornamental purposes the Japanese Barberry (*Berberis thunbergie*, D.C.) may be planted, as this species does not harbour the rust.

LEAF RUST OF WHEAT (*Puccinia rubigovera tritici*, Carleton).

In addition to the stem rust, wheat is attacked by another rust, the leaf rust. This rust is confined principally to the leaves of the wheat plant. It usually appears early in the season and is sometimes quite abundant a month before the stem rust is noticed to any extent. The leaves of the wheat plant become covered with numerous small, oval spots of light red color and powdery appearance. Each spot or pustule (sorus) is surrounded and partly covered by the broken skin (epidermis) of the leaf. As the wheat matures the red spots are replaced by brownish-black patches which remain covered by the skin (epidermis). Although the leaf rust is widely distributed, occurring everywhere where wheat is grown, it does not cause as much damage as the stem rust.

LIFE HISTORY.—The life history of this rust is very similar to that of the stem rust, except that no cluster-cup stage has been found, and consequently this rust is not harbored by the barberry or any other plants, so far as is known, in the same manner as the stem rust.

SUMMARIZED COMPARISON OF STEM RUST AND LEAF RUST OF WHEAT.

Stem Rust.

1. Rust spots are mainly on the stems.
2. The spots of the summer rust are dark red in long lines on the stems.
3. In the winter rust stage (black rust) the spots are nearly black, in long lines on the stems; skin ruptured.
4. Cluster-cup stage on the Barberry.

Leaf Rust.

1. The rust spots are mainly on the leaves.
2. The spots of the summer rust are light red or orange colored, in small oval pustules on the leaves.
3. In the winter rust stage (black rust) the spots are brownish-black in small scattered patches on the leaves; skin not ruptured.
4. Cluster-cup stage not known.