

SUMMARIZED COMPARISON OF STEM RUST AND LEAF RUST OR CROWN RUST OF OATS.

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 or Crown Rust.

1. Rust spots mainly on the leaves; sometimes on the leaf bases.
2. The spots of the summer rust are light red or orange in color, oval or elongate in shape.
3. Spots of the winter rust (Black rust) greyish-black, very small, often arranged in circle, and the skin not ruptured.
4. Cluster-cup stage on the Buckthorn.

THE BUCKTHORN (*Rhamnus cathartica*, L.).

This is the shrub on which the crown rust of oats (*Puccinia coronata*) is harboured. It is a native of Europe, but is quite frequently used for hedges and ornamental purposes in Ontario, and has to some extent escaped from cultivation. It is a shrub or small tree, from six to eighteen feet high, with glossy, ovate, green leaves and thorny branches. The flowers are small and inconspicuous being greenish in color. The berries are spherical, black in color, and very bitter in taste.

The writers believe that it would pay farmers to destroy the buckthorns growing in or near their fields, and thus do away with the means by which the fungus which causes the leaf rust or crown rust of oats multiplies itself so abundantly.

WHY THE AMOUNT OF RUST VARIES.

Since the rust has so many ways of living over the winter it may well be asked "Why do we not have our grain crops destroyed every year by rust, and why even in 'rust years' are some fields rusted worse than those around them." This is answered by the fact that not enough of the rust fungus lives through the winter to infect all the grain plants in the spring, so that it must be spread during the growing season. The extent to which rust will spread depends very largely on soil and atmospheric conditions. If there are periods of muggy weather, especially during the time when the grain is heading out, the rust will spread much more rapidly than if the weather is dry and clear. Cool weather also gives the rust a chance to spread, as it lengthens the growing period of the grain. In wet seasons the grain growing in low poorly drained portions of the fields is usually more severely rusted than on the higher better drained parts, for the reason that the soil in the undrained places remains cold longer in the spring, causing the plants to develop more slowly, and hence they are longer exposed to infection. In these places also the excessive moisture keeps the grain damp, and the rust spores have a better chance to germinate and infect the growing grain. The grain growing along hedges, near woods, and in places sheltered from the wind by hills, is also often more badly rusted because the air does not have free circulation and the plants remain damp after dew or rain for a much longer time than in places where the wind has an opportunity to dry them quickly.