

work of any small-growth timber which may have been left for posterity, and lately the demand for pulp wood has induced the settler to cut everything clear as he goes. Of the five rules that I am familiar with, I should myself be disposed to recommend that which the Government of the Province of Quebec has adopted for its use in levying timber dues on its leased timber lands. The Bangor or Maine rule gives to the settler the most of all, and the claim of the millers, that it allows too much, seems to have some reason in it, when it is known that in one or two cases where the smaller logs are taken, it actually gives more lumber than the logs can possibly contain, having evidently made no allowance for the waste from the saw-cuts. The millers' other claim, that very few country saw-millers can make even a bare living, might also give some excuse for a more favorable scale for themselves. Next to the Bangor rule comes the Oughtred, used and originated by the British American Land Co., and can hardly be looked upon as more than local in its use; it is for small to medium sized logs, about half-way between the Bangor and the one used by the Government of Quebec, which seems to have been based upon and a slight improvement on the fourth in order, the Scribner. Among the improvements which the Government rule seems to possess over the Scribner might be mentioned: it gives a slight percentage in favor of the seller, and it also aims somewhat at giving the contents of logs in round numbers. This latter not only makes the trouble of computing the contents of the logs much more easy (a very important point for the farmer who, as a rule, does not feel competent to cope with the professional buyer in scaling his own logs), but also does much towards protecting the farmers' interests, when, as is often the case, he is induced to accept a certain scale, but "with the odd numbers thrown off." For instance, a log having by the Scribner scale, seventy-nine feet for its contents, would by the government scale, be rated at eighty feet, and, inasmuch as the difference of one foot of timber in a log, at the price of \$5.00 for 1,000 feet, would only make a difference of about one-third of one cent in a log. It would seem, perhaps, wise that the scale as adopted by the Provincial Government should be further reduced to a decimal standard, and be thus recommended for adoption by the Federal Government. Lastly we come to one of the most glaring pieces of injustice that, perhaps, our Government has ever by its non-interference sanctioned for the defrauding of the pioneer settler, the very man, perhaps, of all others, who should at least have justice done him. Under the misleading cover of the "Scribner's Log and Lumber Book," has been issued a scale called "Doyle's rule for measuring sawlogs," and on this I have known notarial contracts designedly made and signed, as being by "Scribner's Log and Lumber Book," and the unfortunate contractors carried on through a whole winter work to their inevitable ruin; and I have more than once been induced to sympathize with these sad men when they have relegated Mr. Doyle and his disciples to a region where something hotter than softwood is used for heating purposes. Whatever steps the Government at Ottawa may take this session towards establishing a just and universal log scale, they should certainly not neglect to confiscate at once all such misleading publications as the Doyle rule, under the cover of being the Scribner Log Scale.

### Parasitic Plants—The Farmer's Microscopic Foes.

J. HOYES PANTON, M. A., F. G. S.  
(Continued from October issue.)

#### SMUT.

We now come to the consideration of a fungus well known to most farmers, and against which we can battle much more successfully than rust.

The attacks of rust are largely confined to the straw, but smut affects the grain directly, consequently if we sow grain clear of it we are likely to escape, but so minute are its spores that many of them may be upon grain apparently clean, and sown with it give rise to the trouble. As there are several varieties of smut we shall consider the habits of some of the most common, and then proceed to the discussion of remedies.

*Tilletia caries*—BUNT, OR STINKING SMUT.

When wheat is affected by this variety the grains are shorter and more swollen than usual, and the color of the kernel is a sort of greenish

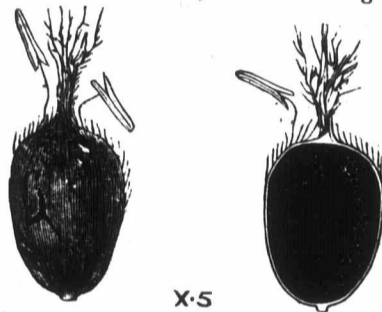


FIG. 1—BUNT.

drab and not unfrequently cracked. (See fig. 1.) These affected grains are completely filled with minute round black spores, having an unpleasant smell, and under the microscope presenting a somewhat roughened appearance, and being much larger than the spores of so-called common smut,

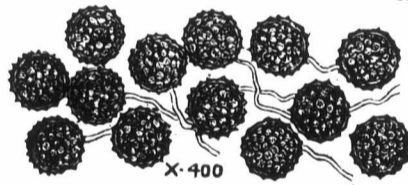


FIG. 2—SPORES OF BUNT.

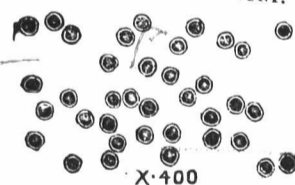


FIG. 2—SPORES OF SMUT.

are readily identified by their external characters. (See fig. 2, showing the relative size of bunt and smut spores.)

These spores, having reached favorable conditions of heat and moisture, germinate and result in structures represented in fig. 3 by B, D and E (reproductive bodies), spoken of as *primary* (B), *secondary* (D) and *tertiary* (E) *sporidia*.

This last form (E) germinating gives rise to the mycelium, an exceedingly slender jointed thread, which ultimately bears perfect spores in the wheat plant, after reaching the seed.

The *sporidia* or *sporidies* are produced outside of the host, but when the third generation (E) have germinated and come in contact with a young wheat plant they find their way into its tissues, and running up the stem between the cells finally reach the seed and bear spores on

tiny branches, as seen in the cut with spores. It has been calculated that one grain may contain as many as 4,000,000 spores inclosed within the thin skin and not exposed as in common smut.

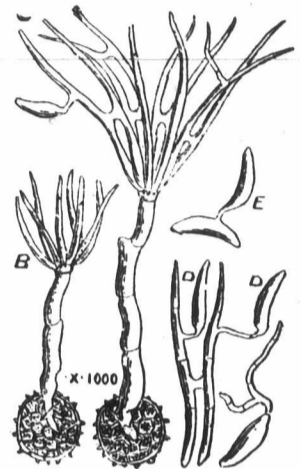


FIG. 3—BUNT.

As the same remedies are used against common smut we shall give its life history before referring to them.

*Ustilago carbo*—COMMON SMUT, OR LOOSE SMUT.

In cases of attack from this form the affected plants are readily observed, as it shows itself very distinctly by covering the ear with "smut."

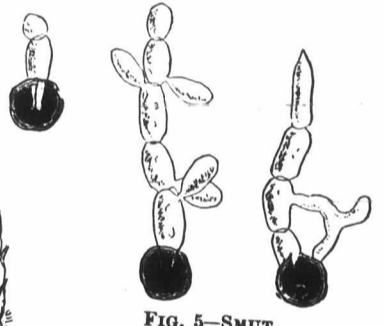


FIG. 5—SMUT.

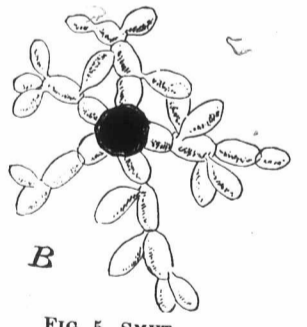


FIG. 5—SMUT.



FIG. 5—SMUT.

(See fig. 4.) The spores have no bad odor and are exceedingly minute, as shown in the cuts illustrating the relative sizes of bunt and smut spores.