

tips. They are so delicate and easily broken that the soil about them needs to be removed most carefully, which can be done if it is sandy; then with the glass these silky light root hairs may be seen filling the fine pores of the soil or enveloping its particles.

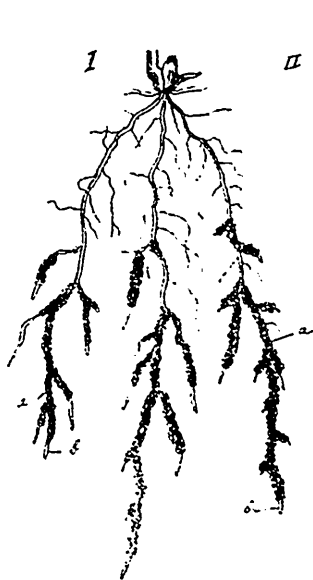


FIG. 2575. ROOT HAIRS.

- I. Roots of a young wheat plant.
 (a) The sand surrounded by root hairs.
 (b) Root tips.
 II. Turnip seedling showing root hairs.
 (After Frank and Tschirch.)

The principal function of these root hairs is to absorb water from the soil and the plant food it contains; and as the plant grows these multiply with such rapidity that they wonderfully increase the absorbing surface of the roots. Each of these rootlets is but a single plant

cell filled with that element of plant life called protoplasm, and, besides absorbing the moisture from the soil, they have the wonderful faculty of so dissolving much of the mineral matter in the soil by their excretions as to render it available by the plant or tree. Our illustration is drawn by Frank and Tschirch from wheat and turnip root tips as they appeared under a microscope. They will help to give our readers a fair idea of these wonderful little root hairs.

A GOOD TOOL FOR THE ORCHARD.

THERE is no doubt that we in Ontario are still behind the times in respect to the tools used for orchard work. Many still

cling to the old-fashioned square tooth harrow and the horse killer cultivator. About the best tool we have adopted is the disc harrow, which is certainly excellent; but for a large orchard which needs constant cultivation all these are too slow and cost too much money to operate, in these days of high wages; and we should economise labor by purchasing better implements if they can be had.

What tools do you use in the orchard? some one asked of Mr. Woodward. He replied that after the four-furrow plow in early spring, the only tool he used was the *smoothing harrow*. This was so called because the teeth could be set at any angle; he set them pointing backward at such an angle that they would not gather rubbish. Each section of this harrow was six feet wide, and he used three sections, thus covering eighteen feet of ground at a time with a team of three horses. He could cultivate twenty acres of orchard in half a day with this harrow. It is not, therefore, very expensive to go through the orchard once every week or ten days in this way, up to August 1st, at which time a cover crop should be sown and cultivation discontinued.

COVER CROPS.

HERE is one of the puzzles of the Ontario fruit grower, to know just what is the best cover crop to use in the orchard. We have tried crimson clover, but as a rule only a small portion of the seed grows, and the result is a cover so thin that it is of little use as winter protection. In one or two instances it has been a grand success, particularly in the pear orchard of Mr. D. J. McKinnon, Grimsby, on a dark, moderately heavy soil, well underdrained. Every year it has grown up thicker, and no more useful or more beautiful crop could be desired.

Rye has been used by a great many, but unless ploughed in very early in spring it