

get anything useful to grow after this preliminary work is completed is undeniably the greatest problem. Sorrel takes possession, and repeated ploughing and cultivation only increases it. Proved sound methods in the development of this type of swamp land may be summarized as follows: (1) Reduce ploughing and cultivation to a minimum right from the commencement; (2) crowd out sorrel and swamp-weeds by sowing Western Wolths rye-grass in March; (3) consolidate and manure by heavy stocking, preferably with cattle; (4) maintain the stock on the rye-grass as long as possible by carting out feed during winter; (5) feed clover hay containing clover-seed, particularly white clover; (6) chain-harrow frequently; (7) surface-sow clovers and Lotus major during the following spring, and during November run the mower over the field to cut down sorrel seed-heads; (8) apply lime as a top-dressing and use alkaline manures.

It is presumed that the swamp has been drained, first by deep open drains and then by smaller lateral open drains. Field-tiles should not be laid until the land has been consolidated. It will then be found that after a good sole of clover and rye-grass is secured fewer under-drains will be required than was anticipated. The reason is that the pasture draws heavily on the moisture of the soil, and the land is thus to a great extent naturally drained. It has been estimated that the water passing through the leaves of clover by transpiration in the production of 2 tons of hay during the period of growth amounts to 504 tons per acre. This is equal to nearly 5 in. of rain.

Since the previous article appeared several experiments have been conducted at Ruakura in connection with the preparation of the land for establishing grass—from deep ploughing to harrowing. A study of the present pastures, which have resulted from these trials, will convince any practical farmer that deep ploughing of swamp land gives an excellent crop of sorrel, spurrey, swamp-rush, and cudweeds, and the first growth of grass will be Yorkshire fog. Sound advice is to keep the sweetened surface soil as near the top as possible during the first stages of development, taking advantage of this soil to promote the first growth of rye-grass.

Western Wolths rye-grass has proved the most suitable grass for the first sowing, and should be seeded at the rate of 20 lb. per acre. If the land has been drained for some time and there is a hope of getting a take of red clover, 6 lb. of that seed per acre should be added.

The question has been asked, Why use Western Wolths rye-grass? The reply is that no other grass will make such rapid growth and thrive to the same extent. It forms a mat of surface roots and produces heavy leafage, crowding out and smothering weeds; it grows well into late autumn, providing the necessary feed for winter grazing; by its mass of fibrous roots it prevents the land poaching; it recovers quickly after stocking; it becomes firmly established the first autumn after sowing, and will consequently hold in check all spring weeds; its strong growth is lost after the first season, thus allowing a better take of clovers to follow; lastly, it is most palatable to all classes of stock, and they thrive well on it.

Several points in favour of a combination of Western Wolths rye-grass and red clover are worthy of mention, for in conducting the swamp-land experiments much care has been given to observation and