

## Ploughable Country With Bracken Fern

The cheapest and quickest method of establishing pasture on ploughable country, especially if one is prepared to topdress, is to burn in the autumn, disc, topdress, and sow as soon as possible. On virgin country it is usually necessary to effect establishment as early as possible, and expense is the deciding factor. Cropping with swedes and rape before sowing down will result in strong pastures, but this involves considerable expense, and can be carried out only by the more financial farmer.

### Hard Fern (*Paesia scaberula*.)

Hard fern (*Paesia scaberula*), also known as ring fern, carpet fern, or sweet fern, is a native volunteer weed widespread in New Zealand on poor hill country pastures with a rainfall in the vicinity of 70 inches or more. Plants establish in places not usually tramped by stock, such as on the steeper faces or in the shelter of logs, etc.

### Control Factors

Hard fern grows from spores, and the plants spread by means of surface rhizomes, which re-root outwards. From these the leaves grow to a height of about 18in, and the plants form more or less circular patches completely covering the ground.

If moisture is low the fern may have a hard time, but in a wet season the patches may increase about 1ft in diameter. After burning, the fern increases in size from the rings more rapidly than on the unburnt patches. Close grazing by sheep favours the re-rooting of the rhizomes on the barer pasture, as in the case with piri-piri (*bidi-bidi*).

### Control

Bracken fern forms strong, underground rhizomes, but on the other hand, hard fern forms numerous wiry, surface rhizomes. On this account control is largely different. Actually, effective burning is the only practical means of control with hard fern, while crushing with stock is the main line of attack against bracken fern.

It is most unwise to burn in the spring, although after the winter the hard fern has much dead growth throughout and burns well. After

spring burning, the fern comes away rapidly as young green growth, and appears to be invigorated, or at least renewed, at this time. The surface rhizomes are succulent and difficult to kill. Young fern may also appear on the ground after spring burning, as there is usually sufficient moisture at this time for the spores to germinate.

### Time for Burning

The best time for burning is in the late summer, autumn, or, on high country, between mid-summer and early autumn. Burning should be carried out, however, only when the rhizomes, as well as the ground, are well dried out. If conditions are such that a really hot fire can be obtained the fern may be killed outright, but at least there will be no growth until the following spring.

If the season is not dry enough, burning is better left until a more favourable season, even if a year or two may elapse. In any case, burning should be delayed for two or three years' growth, which is sufficient to make it possible to have a good fire to destroy the fern, and to allow for a good amount of ash to start the grass seed. Sow immediately on the burn.

Superphosphate greatly assists the young grass and clover, inducing a denser pasture cover and stronger growth. Stock will then frequent the newly-sown patches more, and their tramping causes further injury to any remnants of the fern.

There is no hard and fast rule for burning. Whether the operator starts at the top or the bottom will depend on wind and smoke, the density of the patches, and the steepness of the country. The ordinary blow-lamp is very satisfactory for lighting fires.

It may be difficult to keep out hard fern when the sward is weak, and the land has not been logged, for the ground is usually heavily infested with spores. It is difficult to deal effectively with young plants and rings where patches have not been completely burnt out.

### Spraying Trials

Interesting spraying trials with arsenic pentoxide were carried out several years ago at Whangamomona. A mixture of 1lb to 32 gallons of water proved the most effective strength. A stronger solution killed the tops without sufficient damage to the plants, while weaker solutions were also ineffective. Spraying round the edges of

patches and on isolated plants which are not strong enough to burn might be carried out in January during fine weather several weeks before firing to obtain a cleaner burn.

If cattle make a bed on hard fern the centre dies out, but growth continues outwards from the edges of the rings. Stock would injure the fern by tramping, but they seldom frequent hard fern patches. Crushing is effective with bracken fern, but not with hard fern, and, actually, control of bracken fern in some localities paves the way for hard fern.

Tramping may be effective with hard fern on very small areas, but it is as well to make the distinction between crushing and tramping. Crushing involves tramping and eating, and stock never eat hard fern.

### Pasture Species in Hill Country Sowings

Suckling clover, white clover, and subterranean clover usually establish much better under topdressing. In the secondary bush burn mixtures dogstail is always worth inclusion. Ryegrass affords quick cover and early feed, although its life may be short under hard conditions. A small proportion of Italian ryegrass also gives quick feed in the first year. Brown-top is naturally suited to higher, damper country, and establishes well, but it is not suited to dry hill country, which runs to danthonia eventually.

Danthonia is difficult to establish from sowings, but comes in as a volunteer with the opening up of the sward as other species die out. Cocksfoot is also difficult to establish, particularly under grazing after a secondary burn. A small quantity of yarrow is frequently included on poor hills. *Lotus major* is slow, but has proved useful under wet conditions. *Paspalum* is worth inclusion in warmer districts, and although slow to take hold, it is a valuable pasture constituent in the dry summer months.

