

manuka is cut before spring they will have opened along with the main crop, and they will germinate along with the rest. If the manuka is left until summer before it is cut there will always be a certain number of seeds shed on to the ground that have not germinated at the time of firing, and it must be remembered that a dormant seed is much more difficult to kill by fire than is a young tender seedling. Any seeds that are not killed will, of course, readily germinate and become established soon after the fire.

Late spring burns will kill virtually all the young seedlings, but this time of the year does not offer opportunity for getting grass-seed established on the burned surface. The fact must always be borne in mind that manuka (and, for that, most weed-seeds) will not germinate and establish within a close grass sward. It is only when the grass sward opens up that such become established. Autumn burning of cut manuka not only destroys manuka seedlings, but also affords opportunity for the sowing of grass-seed with a good chance of its successful establishment. Manuka which has been cut and which has lain for long loses the greater portion of its leaves, and thus it may not carry a fire so well as when fired soon after being cut. As the winter is the most opportune time for the farmer to get out to cut his manuka, spring burning is often practised. Where there is already a certain amount of grass such as danthonia, New Zealand rice-grass, &c., among the manuka, spring burning is probably more beneficial to the grass than autumn burning would be, provided the burn is done before the new season's growth has commenced. On areas, however, where sowings of grass-seed are being made the burn should be in the autumn.

Standing manuka that is old enough to bear seed should never be fired. This is the opinion of the best farmers of the Wairarapa and Hawke's Bay districts, where they have had considerable experience with manuka. The heat of the fire is seldom sufficient to consume the seed-capsules on the living plant, and the heat really acts as a ripening process to the capsule. The latter consequently opens soon after the fire has been through, and the seed is shed on to the ash left by the fire. Here there is no competition, and the conditions are ideal for the establishment of the seedling (Fig. 26). Numerous instances have come under the writer's notice where thousands of young manuka-plants to the square foot have come up on standing manuka burns (Fig. 27).

In the Whangamomona district also patches of hard fern are usually associated with the manuka until the latter becomes dense. If such areas are burnt standing the fire sweeps over the top of the hard fern, leaving its rhizomes comparatively undamaged (Fig. 28). Felling the manuka on these areas means that a much more intensely hot fire is secured close to the ground surface, and thus the hard fern may be entirely killed out by the firing. The manuka-plant itself is readily killed by fire, and this fact can be made use of in the burning of manuka areas while the plants are still small—but only provided no seed-capsules have matured. To do this there must be some growth such as danthonia, brown-top, or *paspalum* present that will carry a fire.