

Everyone likes a nice green lawn. This show ours, which looks like this all year.

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A good lawn makes a garden. To achieve it requires topsoil deeper than 25 cm, adequate LimePlus (See Elements in Soils, Pastures & Animals > Minerals > Calcium, applied every two or three years, correct fertilising (no superphosphate or fertilisers containing it) and **not** cutting below 3 cm. If these things are done, watering in dry weather will be minimised.

Insufficient LimePlus and cutting too short are the main causes of weedy, brown, dry lawns. This low mowing on the left of this photo was because the soil was 3 cm above the path. The soil level should start at 2 or 3 cm below paths, edges and the mowing strips. Soil will rise to path height in a few years and can become too high like this did. An established lawn can have the knobs lowered by using a soil sampler as shown, pushing it in to the full depth and removing the plug of soil that comes out. Do this every 15 cm and repeat it in the future if necessary. The grass will grow over the holes. Moistening the soil first makes the job easier.



Hollows or depressions can be filled with a weed-free soil with 10% fine sand mixed in. Drag a 15 cm RSJ steel or timber leveller over it a few times in different directions and sow seed as described below.

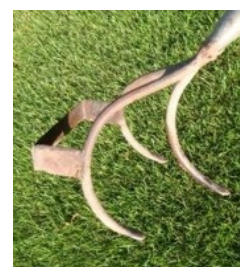


Sowing a new lawn

Before sowing a new lawn get it smooth. When uneven the mower cuts the high knobs too low and the hollows too high. Rain runs off the knobs into the hollows, causing the knobs to become too dry and the hollows too wet. Moisten the lawn, then shave off high areas with a sharp spade and scrape any knobs into the hollows, and roll and drag a heavy steel or timber leveller on an angle four or five times in different directions. If your soil is heavy clay, mix in some fine sand or at least spread about 5 mm on top of it. Sand can be \$70 per m² or even dearer in bags. It is cheapest from a bulk store, road builder, or concrete supplier.

This hand operated minor chisel plough is good for loosening soils. If needed, apply lime at 3 to 6 kg per 10 square metres and mix it in to at least 10 cm, or deeper if possible. The bar on the back is for weeding.

If the soil has been cultivated deeply or is loose, levelling and rolling will be necessary before sowing. Rollers can be hired or a car trailer can be pulled by hand over it, using the wheels to compress the lumps. Small areas can be stamped by feet wearing smooth soled boots.



In building subdivisions in Hamilton, NZ, topsoil will be only 5 cm deep, in which case bring in enough to increase it to preferably 30 cm. In Tauranga, NZ, the council expects developers to replace 30 cm of topsoil, which grows better lawns and vegetables and reduces drying out

and watering. If you are buying a new section stipulate 30 cm of topsoil. Get the house builders to spread the soil back over the section, not sell it. If there is not enough, dig up some of the subsoil with a fork and mix it in to the top soil with the miniature chisel plough above to increase the topsoil.

Which lawn to sow

There are many choices. Perennial ryegrasses are the most popular. There are a dozen mixes. Fescues with Browntop are good for hot dry areas that can't be watered. Then there are plants such as Mercury Bay weed. We have tested most of them since 1980 and found the NZ bred Colosseum turf perennial ryegrass the best by far. Our lawn is all Colosseum now.

Agridark (*Cynodon dactylon* L) lawn grass was developed in the 1990s by AgResearch Grasslands, PB 11008, Palmerston North, New Zealand. It frosts brown so is unacceptable where frosts occur. Agridark comes as washed stolons bagged for 5 sqm costing \$50 in 1999. Once a dense mat has been formed no more runners are produced. Where you have concrete border edge (e.g., your path), you will need to trim off the runners two or three times until they stop being produced. They can grow under narrow edges and come out the other side. It does not like shade and so will not spread into shaded areas like under trees. We grew some, but gave up within a year for a lot of reasons, such as brown in winter, thick and dense so very hard to push the mower, spread to where not wanted and not as good looking as the beautiful green of Colosseum lawn perennial ryegrass.

Sowing

Some companies sell junk as lawn seed. See March 03 NZ Consumer magazine. There is a big difference in seeds so don't be sucked in to mixes of various types of grasses that will NOT give strong even lawns and are not as easy to manage as Colosseum perennial ryegrass. Beware of farm perennial ryegrass because it will need mowing twice a week and never be dense.

Colosseum is the only perennial ryegrass I know of that stools (grows leaves horizontally), so covers bare patches. It is available from Turfgrass Specialists Ltd, Box 58 316, Greenmount, Auckland, NZ. 09-274-0831 or PGG Wrightsons. They and others will try to sell you mixes, but Colosseum on its own is the only one I know of that grows horizontally so stools, needs less mowing and gives a dense lawn. It is not as dark green as some, but look at ours on page 1. Most other companies have USA bred grasses which are more inclined to suffer funguses in New Zealand's humidity.

Sow Colosseum perennial ryegrass at 60 grams/m² and cover it with 5 mm of 50% fine sand and 50% Lawn or Potting mix. Water it well then lightly two or three times a day until the grass is 4 cm high.

When 8 cm high cut it down to 6 cm, and never below 6 except when getting rid of thatch each spring and each autumn when, after rain, cut it to about 2 cm once to remove thatch, which is dead grass at the base of lawns, which is less if earthworms are present in adequate numbers. Then oversow with Colosseum at 30 grams/m², rake it in with a sharp knife rake shown, or cover it as described above.

This single Colosseum plant is from a seed blown on to our courtyard. It shows how Colosseum stools and covers bare patches making a dense lawn. Most ryegrasses grow vertically.

Immediately after sowing, cover it with plastic or metal bird netting, and/or erect scarecrows using a vertical support (garden fork or spade, pipe, steel standard or timber) with a crossbar tied on to hold old clothes, and a hat or bucket as a head. Re-position it every second day or birds will ignore it.

Newly sown lawns may need mowing every four days. We mow our lawn weekly all year.

Lime

All Waikato and most New Zealand soils and lawns need lime at 6,000 kg per hectare (10,000 m²) or 6 kg per 10 sq metres every two to four years. It is to replace losses and neutralise the acid effects of other fertilisers and high rainfall. One lime company recommends nearly double this amount on its bags which is for cultivating it in to 30 cm deep. Some say that lime will encourage earthworms in lawns which are a nuisance to some people, and they can be, but they are better than moss, weeds and dead grass that earthworms eat. AgLime from RD 1, Wrightsons or Farmlands is about \$8.00 per 25 kg (\$320/tonne)



which is a quarter the price from garden stores. Farmers see the spreadsheet to buy LimePlus for about \$100 per 1,000 kg delivered, or the Phosphate Nutrient Planner spreadsheet. If others know a farmer you may get some from them or buy it in bulk in 10 kg lots from Lynda Kamphuis, 33b Marshmeadow Road, Newstead, RD 6, Hamilton near HW 26, the Hamilton to Morrinsville Road. Phone 07-858-2200. Email: john.kamphuis@maxnet.co.nz See the Garden chapter for full details.

For full information on liming, see Minerals in Soils, Pastures & Animals > Calcium.

Most New Zealand lawns where the clippings are removed, become low in magnesium (Mg). The photo on the right shows a Mg deficiency. Nitrogen deficiency causes grass to go light brown, rather than the yellow stripes in leaves of Mg deficiency shown here. Graymont lime contains 2.14% magnesium which makes it the cheapest and best slow release magnesium. Applying lime and nitrogen over several years reduces magnesium levels, unless in a rare high magnesium soil in parts of Hauraki and Whakatane alluvial soils. Read Elements > Magnesium.



Fertilising

After the first mowing, spread fertiliser just before rain or water it in. Each time the lawn goes yellow apply 0.2 kg per 10 m² of Sulphate of Ammonia (21% N and 24% S), and once a year a complete slow release reactive phosphohte based fertiliser. Water in fertilisers immediately so they don't burn the grass.

In average weather, watering once a week is enough and encourages deeper rooting, but in hot (> 26 degrees C) dry weather water 2 mm every third day. Summer water restrictions in Hamilton don't allow this, so water on every second, or water more on every fourth day.

These Colosseum ryegrass roots show that lime and other elements are adequate. If lime or phosphorus were lacking, aluminium would stop them going straight down so deeply. The grass's red bases show it is ryegrass.



Lawn Pests

Dead patches in lawns can be from cat urine. They love a soft 5 cm long lawn. Cat urine kills grass within days and a green outer circle develops from the nitrogen in it. Sprinkling with water in the evening discourages cats from lawns and gardens. See Cat Fence.

Fusarium, is a fungus and spreads in circles. Dollar Spot has a web.

Red Thread fungus shown causes spreading pink patches that kills the grass. They can be prevented by fertilising regularly with optimum sulphate of ammonia.



Spraying all the above with a pressure spray system is best, but takes a lot of preparing, cleaning jets and washing the gear afterwards. I use a small watering can and Copper Oxy-chloride diluted more than recommend to allow for the extra water going on. Copper Oxy-chloride is safe, but those allergic to it can use Rovral or Tetrattech.

Spraying contractors can do this, but to avoid a fright and argument, always get a quote for the finished result.

Grassgrub and Porina can kill lawns in patches. Dig and check. They are easy to see. If there, water with Neem oil at 1 litre per m². It is safe and stops pests growing into adults.

Some watering can holes may need closing with a glue such as Pliobond. The rose on this watering can was too loose so fell off until Pliobond held it on. It is the brown that can be seen in the photo. Pliobond glues anything to anything, and can block gutter leaks even when the gutter has water in it. If there is a hole, place a nail or folded wire over it and then Pliobond. Broken plastic toys are its love. I have a thousand at \$4 each. Retail them at any price. They make ideal presents and company staff gifts.

Management

The things that make a good green lush lawn are foot deep topsoil, adequate lime, not cutting too short, controlling weeds with Grazon (see below) if a lot, correct fertilising and watering when needed.

Ryegrass lawns can die in dry heat, especially if topsoil is shallow and optimum lime has not been applied.

Lawn ryegrasses have to be managed to suit the requirements of ryegrass. If cut short (below 5 cm) repeatedly, especially in summer, the lawn will end up with little ryegrass and plenty of moss and flat weeds, so let it grow to 9 cm tall and cut tdown to 6 cm. Mowing at this height will limit weed germination and make your lawn and mower last longer. Sparrows will drop seeds, but fewer will germinate in a thick long sward, and sparrows prefer short weedy lawns so won't be such a problem on your longer weed-free lawns. Poa Annua seeding attracts sparrows that bring other seeds, so spray the Poa with Grazon. Poa is a lighter green, short grass that seeds quickly with light coloured seeds.

Anyone who grazes or eats any recently sprayed pasture or crops is asking for problems, but Roundup promoters claim it is safe and recommend grazing it.

Six pregnant Waikato mothers in a Roundup sprayed area had their babies affected by it.

Roundup sprayed paddocks prior to growing maize pollutes it and the milk of cows that eat the maize. I've measured both, so I talk facts. Dr Mercola in USA has measured it in milk and is absolutely against Roundup.

Grazon

This is the only killing spray I've used for 18 years, always with 50% Codacide (vegetable oil) added, which gives a better spread and allows half the rate of Grazon to be used, and stops drift and saves money.

Perennial ryegrass grows well in most of New Zealand and can be kept pure by spraying with Grazon that kills everything except ryegrass. It kills Poa, Paspalum, Kikuyu, fescues, twitch, couch, Wandering Jew, shrubs and trees - so be careful with it. Mixed with an equal amount of Codacide, halves the amount needed and stops drift.

The main problem weed in established lawns is Poa which Grazon kills easily in winter when it's young. When older use a 20 to 40% stronger mix. If you are new to spraying do a small area and check it after a week. The effect it has is to make the Poa grow faster and to seed. Too strong a rate can kill the ryegrass so don't overdo it. The manufacturers recommend disposing of the first mowing, but we have not done so for 12 years. It goes on the compost heap with lime mixed in to it and has not affected the earthworms. I sprayed the soil above half our earthworm breeding area with Grazon, and earthworms 2 cm below it were not affected at all.

Used correctly, it is a safe spray. I and many farmers are allergic to Glyphosate and other sprays. I have used Grazon since 1998 with no problems, but I'm careful and always use Codacide which is a vegetable oil that makes sprays go twice as far by spreading the spray evenly over the leaves, halving the amount of Grazon or other chemical needed, slows evaporation, reduces drift, improves spread and coverage on the plants, makes hormones less volatile, so operators smell the spray less, but don't be fooled into safety. If using 50% Codacide you must use only half the Grazon rate, or the higher killing effect can burn weeds and grasses which reduces translocation to the roots.

If it rains soon after spraying, the Codacide holds the spray onto the leaves.

We spot spray weeds in our lawn at half rates and have never seen the compost earthworms affected by the clippings or seen any other problems, nor have the earthworms in the lawn been affected. I dug and checked under sprayed and not sprayed areas and was pleasantly surprised.

I've not been affected by Grazon, nor has anyone complained to the makers (Dow Ltd in new Plymouth) about being affected, while bad effect complaints about Roundup have been frequent. Grazon effects have not been complained about to the Hamilton health specialists who drain toxins out of people. Toxin specialist, Dr Ricky Gorringe, has not heard of anyone affected by it.

One has to be very careful with information because of commercial rogues. When researching items for GrazingInfo I had to discard a lot of propaganda and untruths, so do USA doctors Mercola and Sears who are excellent and helpful international health specialists.

I've not been affected by Grazon, but have twice by Roundup used by the council 30 metres away, nor has anyone complained to the Grazon makers (Dow Ltd in New Plymouth).

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Roundup was known by Monsanto since its beginning to affect the pre-borns in animals and women, but this was only exposed 30 years later.

Put the Codacide in the measurer first, swill it around to cover all the inside surface then pour in the chemical and mix it thoroughly with a rod. Putting the Codacide in first makes the measurer easier to

clean. Wear protective gear and keep your mouth closed in case of splashes you may make.

Use an extension wand to keep the spray further away from you.

Spray units that strap on the body are not advisable. One burst while on a person.

Grazon (when new) at only 6 ml (half the recommended) per litre of water mixed with the same amount of Codacide does a good job by killing everything except ryegrass. If not well done a second spraying may be necessary. As Grazon gets older it loses effectiveness so after a year use 10 or 12 ml per litre of water.

Don't spray in the heat of the day because the leaf stomatas (pores) closed so don't absorb. Late afternoon is best and Poa is easier to see then. A very slight breeze allows spraying safely by walking backwards into the wind.

Spray three days after mowing then don't mow for at least a week. If weeds such as Poa annua have seeded, slightly higher rates of Grazon may be necessary (see its instructions under the label). Poa needs to be sprayed whenever seen. Small numbers can be pulled out.

Grazon costs about \$90 per litre, but will last an average lawn for a decade, by which time a much higher rate will be needed, so can be shared with others, but not by putting any in another container which is illegal, so keep old containers.

The easiest way of getting sprays out of containers is to drill a 5 mm hole in the lid and use a self tapping screw to close and open the hole from which to pour.

Grazon is toxic, but apparently drains out of the body, unlike many sprays and mercury that stay in the body and can cause severe health problems. Wear safety gear of longs, long-sleeve shirt, hat (not just a cap). Immediately after, rinse your mouth a few times and shower in cool water (hot water opens your pores) followed by warm water and Ego GV safe bath oil from a chemist.

Hot water is a safe killer of plants so use it where total killing is needed for individual weeds, around trees, path edges and areas where mowers can't reach.

Moss will grow on wet, under-limed, under-fertilised, over-shaded and bare patches. It can be controlled with iron and moss killers, but get rid of the causes which include - insufficient LimePlus, (Read Elements > Calcium) fertiliser, mowing the lawn too short, wet clay soils that have not had sand and/or enough lime applied, over-use of acid fertilisers. Never use superphosphate for anything. It is acid, costly and makes heavy metals available. See Vegetables.

Lime has been mentioned a few times. See Elements > Calcium for the full information on it.

Reducing earthworm numbers

If earthworm casts become a nuisance, apply urea at 50 granules per square metre. After one application they'll start starving and moving away and you may not have to repeat it for a long time. Don't apply urea on pastures, analyse leaves and use Lime Nutrient Planner or Phosphorus Nutrient Planner to apply the deficient elements and grow correct clover and grass pastures that hardly need artificial nitrogen, except for newly sown pastures for their first two months. Note that she is not mowing it short.

Doing the above can give you a The main problem weed in established lawns is Poa which Grazon kills easily in winter when it's young. When older use a 20 to 40% stronger mix. If you are new to spraying do a small area and check it after a week. The effect it has is to make the Poa grow faster and to seed. Too strong a rate can kill the ryegrass so don't overdo it. The manufacturers recommend disposing of the first mowing, but we have not done so for 12 years. It goes on the compost heap with lime mixed in to it and has not affected the earthworms. I sprayed the soil above half our earthworm breeding area with Grazon, and earthworms 2 cm below it were not affected at all.



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50% Codacide you must use only half the Grazon rate, or the higher killing effect can burn weeds and grasses which reduces translocation to the roots. If it rains soon after spraying, the Codacide holds the spray onto the leaves. ryegrass lawn like this that my wife Auriel, kept neat and tidy for decades.

Thick dense lawns like this, not cut short, don't have anywhere for seeds to make contact with the soil and germinate, or for weeds to grow, but some will, mostly from our seeding flowers and birds carrying them.

Mulching also improves lawns and the soils under them. The council park next to us, was taken out of farming 30 years ago, and when digging under the grass is better than many farm soils. It has no hard pan, about five Calignosa earthworms per spade spit, and better structure than many farms. At field days I run here, farmers ask why. It is because all mowings have been returned to feed the earthworms, with no milk or meat removed.

Poisonous leaves

New Zealand, Macrocarpa (Cupressus macrocarpa) are often grown on livestock farms, but they can be toxic. Some animals like the leaves after they have dried. Even a small amount can cause abortions in sheep, goats and cattle, and deaths have occurred. All farmers should be aware of this poisoner and fence it, or get rid of it, and the leaves. Read the Poisons Chapter .



Grazing sheep on lawns

Read Small Farming, Lifestylers and Sheep, Part 1.