

PAMPHLETS IN THIS FOLDER:

TURF MAINTENANCE WITH GROMOR

LAWN TIME

GROMOR WATER SOLUBLE HYDROPONIC FERTILIZERS

GROMOR CHICKEN LITTER PUTS LIFE BACK INTO TIRED SOIL

GROMOR FERTILIZER RECOMMENDATIONS

FEED YOUR PLANTS

ROSES

GROMOR ACCELERATOR ORGANIC FERTILIZER PELLETS

GROMOR BRAAIKIUKENMIS GEE LEWE TERUG AAN UITGEPUTTE GROND

GROMOR GROWING MEDIA

FOLIAR FEEDING

SEEDLING PRODUCTION

BOWLING GREENS

TURF MAINTENANCE WITH GROMOR

In an ideal world, turf should be given a late winter maintenance treatment, in the latter half of July or August, before the spring rains commence. When it comes to turf for sporting purposes, it is however not an ideal world, as the sports season may clash with the best time for maintenance. Fortunately, nature is forgiving and very little is lost if the maintenance treatment is carried out at another time of the year, EXCEPT if one runs equipment, tractors and vehicles over the turf when it is WET.

ANNUAL MAINTENANCE

Cut the grass as low as possible, using a mower with sharp blades.
On compacted turf, use a "HOLLOW TINER" or "SLITTER", but try to avoid a spiked roller.

Apply **Lime** at 1 ton/ha (100g/m²). (10 x 50kg bags on a rugby, soccer or hockey field) **Dolomitic Lime**, which supplies both Calcium and Magnesium, is recommended, EXCEPT where the turf is established on clay, where **Gypsum** is preferred.

PUTTING AND BOWLING GREENS

Apply **GROMOR GREENS DRESSING** at 1m³ to cover 100m². Available in BULK or BAGS (In bags 1m³ = 20x 50dm³ bags)

RUGBY, FOOTBALL, HOCKEY FIELDS

Apply **GROMOR TURF DRESSING** at 1m³ to cover 200m². Available in BULK or BAGS (20m³ to cover a rugby, soccer or hockey field. In bags 20m² = 400x 50dm³ bags)

Whilst Turf topdressings traditionally contain riversand, **GROMOR TURF DRESSING** does **NOT**. Unfortunately, river sand contains pebbles, which are not a problem when it comes to growth, but creates havoc with mower blades. (NB: **GROMOR TURF DRESSING** does **NOT** contain riversand)

LEVELLING

When levelling and filling in subsidence, order a "custom blend" containing **Riversand**. Fill in the uneven parts and cover with the GROMOR GREENS or TURF DRESSING.

MAINTENANCE FERTILIZER

Whilst it would be nice to recommend an organic fertilizer like **GROMOR ACCELERATOR** that does not cause soil acidity or play havoc with soil organic matter and beneficial microbes, generally the quick response from inorganic fertilizers is preferred.

If possible stay away from straight nitrogen (N) fertilizers (e.g. LAN or Urea) and rather use a compound fertilizer containing an equal or higher amount of potassium (K) e.g. **GROMOR 5.1.5(28) or for the big areas, the cheaper 5.1.5(36) in the 50kg bags.**

Apply at intervals of 2 months (NOT shorter), depending on the condition of the grass sward, limiting applications to a maximum of ±15g/m² per application (75kg on a rugby, soccer or hockey field)

If at all possible, replace the chemical fertilizer with quarterly applications of **GROMOR ACCELERATOR ORGANIC FERTILIZER PELLETS** at 150g/m² (1 x 40kg bag **GROMOR ACCELERATOR** to cover ±250m² or 20 x 40kg bags on a rugby, soccer or hockey field).

MOWING

Whilst a low mowing and removing dead "thatch" is desirable before carrying out the Annual Maintenance, for the rest of the year rather give a weekly light trim. Regular mowing, so as to leave an even green finish without heaps of cut grass and brown patches, is the ideal, as the grass sward will then retain sufficient leaf photosynthetic area, obviating the need to draw on root reserves to start growing again. The result will be a healthier sward, better able to withstand pest and disease attacks.

BOWLING GREENS

There are a number of constraints that need to be considered when setting up a "GREENS" MAINTENANCE PROGRAMME.

Regular mowing and the removal of clippings will have drawn "plant food elements" out of the soil. Whilst regular fertilizer applications will have replaced some of the elements (e.g. NPK), this would not have been the case with others, especially micro-elements.

Regular applications of inorganic fertilizers, especially nitrogen (e.g. LAN, Urea), will have acidified the soil and diminished soil organic matter and beneficial soil microbes, all of which are vital in sustaining a healthy soil, necessary to grow a healthy grass sward.

Soil acidity is counteracted by "Liming". Unfortunately, unlike nitrogen (N) the calcium (Ca) from lime does not leach down the soil profile, literally staying where it is put. The problem with soil acidity is that it compromises the uptake of "plant food" elements by plant roots e.g. phosphate, potassium, boron, copper, molybdenum etc are locked out, whilst manganese and aluminum are taken up at toxic levels in acid soils.

A drop in soil organic matter and with it beneficial soil microbes, leads to a hostile environment unsuitable for supporting healthy grass growth.

These effects can be partly countered with an annual maintenance programme incorporating an "organic topdressing" and applications of Lime and Gypsum. Gypsum whilst taking calcium down the soil profile, does unfortunately not ameliorate soil acidity.

ANNUAL MAINTENANCE TOPDRESSING.

Mow and apply:

1. **GROMOR "GREENS" DRESSING** 7,5m³ per "GREEN" (38,5m x 38,5m)
(7,5m³ = 150 x 50dm³ Bags)
2. **GROMOR ACCELERATOR** organic fertilizer pellets
5x 40kg bags per "GREEN"
3. **DOLOMITIC LIME**
2 x 50kg bags per "GREEN"
4. **GYPSUM**
2 x 50kg bags per "GREEN"

MAINTENANCE FERTILIZER

Whilst it would be nice to recommend an organic fertilizer like GROMOR ACCELERATOR that does not cause soil acidity or play havoc with soil organic matter and beneficial microbes, greenkeepers generally prefer the quick response from inorganic fertilizers.

If possible stay away from straight nitrogen (N) fertilizers (LAN and Urea) and rather use a compound fertilizer containing an equal or higher amount of potassium (K) e.g. Gromor 5.1.5(28) or the cheaper 5.1.5(36). Apply at intervals of 6 weeks (NOT shorter) depending on the condition of the grass sward, limiting applications to a maximum of ±15g/m² per application (20kg/GREEN)

Where a rapid response is required and the fertilizer can be applied via the irrigation system, dissolve GROMOR 3.1.3(37)ws complete, at a rate of 1g/litre of water. An advantage with GROMOR 3.1.3 (37)ws complete, is that it also contains micro elements.

LAWN TIME

August is early to be thinking about lawns, but starting the "spring maintenance" treatment in winter, whilst it is still dry, has advantages.

BEFORE THE RAINS COME – MID AUGUST

- Service your mower, sharpen the blades and cut the grass low.
- Brush or rake off all the "thatch".
- If the lawn or turf is "rock hard", consider "spiking" before the regular rains start.
- Don't forget to Lime! **GROMOR Agricultural Lime** 1x10kg bag/100m³.
- Apply **GROMOR Lawn Dressing** at (1 bag per 5/10m²)
- Start watering in August or wait for rain.

ONCE RAINS START – SPRING, SUMMER, AUTUMN

- Raise the mower blades so as not to leave brown patches when mowing. Mow regularly (once a week) giving a light trim, so as NOT to require clippings to be raked off.
- After the first spring mowing, apply a dressing of **GROMOR 5.1.5(28)** at 30g/m². The high potassium makes the lawn more resistant to fungal attacks (e.g. "Fairy rings").
- Through the growing season alternate **GROMOR 4.1.1(21)** at 30g/m² and **GROMOR Accelerator** at 150g/m² every 6 to 8 weeks. If the lawn is green, healthy and growing too fast, cut down on the **GROMOR 4.1.1(21)**.

If you want to go ORGANIC, cut out the **GROMOR 4.1.1(21)** and **GROMOR 5.1.5(28)** and replace with **GROMOR Accelerator** at 150g/m² as required.

GROMOR LAWN DRESSING is a blend of **GROMOR Compost** and **GROMOR Composted Screened Pinebark**, with a small fertilizer 'charge'.

Pinebark, whilst not high in plant food, has proved to be beneficial in reducing soil compaction, which in turn improves growth, particularly where the grass is subjected to regular traffic (foot, cycle, cars etc).

WEEDKILLERS for problematic lawn weeds.

1. BROADLEAF weeds, which includes HYDROCOTYL (often incorrectly referred to as Clover) can be a problem on moist, shady parts of the lawn. Spray with a selective BROADLEAF WEEDKILLER, which contains 2,4D or MCPA e.g. BANWEED or TROOPER. To 5l water add one cup of vinegar and 50ml BANWEED or TROOPER and 10ml BOOSTER OIL.
2. WATERGRASS (Nutgrass) is distinguishable from broadleaf weeds, by its triangular stem and "bunched seed head". SERVIAN, added to the above spray at 1g SERVIAN/5l water, should kill the watergrass.

DO'S AND DON'T'S when using weed killers!

1. On lawns DO NOT use a NON-SELECTIVE WEEDKILLER like SPRINGBOK or ROUNDUP. They will kill everything, including the grass!
2. Using a GARDEN SPRAY is preferable, but on a small area, applying weed killer with a watering can, with a "fine rose", works well. (Make sure to rinse out the watering can thoroughly when finished)
3. There is no need to soak the plants – you're looking for a fine sprinkling on the leaves.
4. Spray on a clear, calm, sunny day, when the plants are growing actively and AVOID SPRAYDRIFT onto neighbouring flower and veggie beds.

WATER SOLUBLE HYDROPONIC FERTILIZERS

HYDROPONIC FEEDING

WATER pH

Before making up a nutrient solution, it is essential that the water pH be checked. If the pH exceeds 6,4 add acid to the water BEFORE any fertilizer is added.

How much acid to add, depends on the pH and the buffering capacity of the water. Initially add 125ml Nitric Acid per 1000 litres water. If necessary, gradually add more acid until the pH drops to between 5,6 and 6,4. Once a rate per 1000 litres is established, a weekly pH check will suffice.

WARNING:

- a) The pH of water from the same source does NOT always remain constant.
- b) If the nutrient solution goes cloudy when adding fertilizer, it is precipitating and the elements will not be available to plants. Seek advice!
- c) Acid is dangerous. Avoid contact and make sure NO metal touches the acid in its concentrated form.

CONCENTRATE SOLUTIONS

Keep the calcium and phosphate sources separate when making a concentrate solution. i.e. make separate concentrate solutions with "NEW GENERATION COASTAL BLEND" and "CALMAG N". Only mix them in the final dilute solution.

- a) Don't make concentrate fertilizer solutions more concentrated than 1kg fertilizer in 10 litres water - preferably not stronger than 1kg in 20 litres.
- b) Make certain that the water used to make the concentrate solution and the final nutrient solution has a pH less than 6,4 (Preferably between 5,6 and 6,4)
- c) Use concentrate solutions as quickly as possible - preferably within a day.
- d) Dissolving fertilizers in a bucket of water, is effectively making a concentrate solution, making the above rules applicable!

COMPLETE Nutrient Solution (MACRO and MICRO ELEMENTS) using GROMOR NEW GENERATION COASTAL BLEND and GROMOR CALMAG N

The general recommendation is:

1kg GROMOR NEW GENERATION COASTAL BLEND

1kg GROMOR CALMAG N

IN 1000ℓ WATER

Mixed as above, this will yield a nutrient solution with the following analysis:

Macro Elements g/1000ℓ (ppm)

| | |
|----|-----|
| N | 205 |
| P | 45 |
| K | 258 |
| Ca | 176 |
| Mg | 34 |
| S | 62 |

Micro Elements mg/1000ℓ

| | |
|----|------|
| Fe | 1700 |
| Mn | 220 |
| Zn | 440 |
| Cu | 70 |
| B | 410 |
| Mo | 47 |

"CHEMICAL DROUGHT"

Chemical droughts occur in crops grown in bags, where there is insufficient run off. The EC around the root ball increases to unacceptably high levels. It can be identified, by taking weekly leachate EC readings, which should not exceed those of the nutrient solution by more than 10%

To rectify the problem:

- a) Place the "drippers" as close to the plant stems as is practically possible, but NOT directly onto them.
- b) Allow for 20% runoff at each watering.
- c) Apply a watering regime that will not allow the media to dry out.

GIVE A LIGHT WATERING AT SUNRISE

- a) Because plants start slowly shutting down nutrient uptake (and consequently growth) about 5 hours before sunset, maximum use must be made of the time from sunrise to ± 2 pm.
- b) At sunrise, open tunnels to get a change of air. This should even be done on cold mornings, so as to reduce humidity to improve photosynthesis. (A high relative humidity causes moisture to "stick" between stomata hairs and hinder the leaf absorption of carbon dioxide, required for photosynthesis.)

INSTITUTE A 9PM FEED IN THE HOT MONTHS

This will lessen the chances of cracking fruit. (If practical, this feed should constitute 1kg CALMAG N in 1000L water, rather than a complete nutrient solution)

RECIRCULATING NUTRIENT SOLUTIONS

Recirculating nutrient solutions as used in gravelbeds, should be dumped and replaced with a freshly made up solution every 2 weeks.

GROMOR 3.1.3 WS COMPLETE

Nutrient Solution

1kg GROMOR 3.1.3 ws Complete in 1000 litres water

Macro Elements g/1000 litres (ppm)

N 149

P 47

K 148

Ca 6

Mg 8

S 2, 6

There is insufficient Ca for a high producing crop, making GROMOR 3.1.3 ws complete only suitable for Nursery plants and Seedlings grown in calcium enriched media.

Micro Elements mg/1000 litres

Fe 1680

Mn 400

Zn 200

Cu 30

B 500

Mo 50

SEEDLINGS

Feed seedlings grown in GROMOR SEEDLINGMIX at least twice a week from germination (preferably once a day) with a nutrient solution comprising 1 kg GROMOR 3.1.3(37) ws complete per 1000l water.

For container grown ornamentals grown in Gromor Potting Medium a weekly watering with a teaspoon of Gromor 3.1.3(37) ws complete (or GROMOR Plant Food) diluted in 5l water does wonders!

"FEED" YOUR PLANTS!

A fertile soil is a living entity and not simply a conglomeration of chemical elements. Whilst chemical fertilizers supply plant food (NPK), over time they acidify the soil and are associated with a drop in humus and soil life, factors which negatively effect the plant's ability to utilize the plant food in the soil. Compost on the other hand, helps to build a healthy fertile soil by stimulating "soil life", raising the humus status and improving mineralisation, nitrification, cation exchange capacity, soil structure, aeration etc.

GARDEN SUCCESSFULLY WITH GROMOR AND FIELD

1. LIMING

KZN soils are inherently acid, especially where chemical fertilizers have been regularly used. Apply GROMOR LIME at 100g/m² per annum in winter, to all areas other than to where acid loving plants are growing (e.g. Hydrangeas and Azaleas). 1x10kg GROMOR LIME/100m²

2. NEW GARDENS – one month before planting apply and dig in:

- (a) GROMOR COMPOST – 1 bag to cover 5-10m²
- (b) GROMOR LIME – 300g/m² (dig in as deeply as possible)
- (c) GROMOR SUPERPHOSPHATE – 60g/m²

3. VEGETABLE AND FLOWER BEDS

PREPARE by forking in GROMOR COMPOST – 1 bag to cover 5-10m²
Plant with GROMOR ACCELERATOR at 300g/m².

4. SHRUBBERIES (Acid loving shrubs excluded)

PREPARE by forking in GROMOR COMPOST – 1 bag to cover 5-10m²
To each planting hole add GROMOR COMPOST 1 bag to 4 holes and 150g GROMOR ACCELERATOR/m². Over the growing season apply a further 300g/m² GROMOR ACCELERATOR organic fertilizer pellets/m².

5. ACID LOVING PLANTS

Prepare by forking in GROMOR ACID DRESSING 1 bag to cover 5m². Fertilize with Ammonium Sulphate at 30g/m² in spring and autumn.

6. ESTABLISHED AREAS (e.g. perennial flower beds)

GROMOR COMPOST – 1 bag to cover 5-10m².
GROMOR ACCELERATOR at 150g/m² in spring and autumn.

7. LAWNS

Establishment: Before planting, fertilize as per 2. "NEW GARDENS"
Maintenance: In winter apply GROMOR LIME at 100g/m². In late winter, early spring (August) apply GROMOR LAWN DRESSING 1 bag to cover 5/10m². Through summer and autumn alternate GROMOR ACCELERATOR at 150g/m² and GROMOR 5.1.5 (28) at 20g/m² as topdressings, every 2 months, or as required to maintain desired growth.

8. POTPLANTS

Plant in GROMOR POTTING MEDIA. Wet the media before filling containers. Give your pot plants a weekly feed, by watering them with a solution of one teaspoon GROMOR PLANT FOOD in 5 litres water. (To bring 'sick' pot plants back to life, dunk the pots in a bucket of water – once soaked, remove them to drain and give each pot a handful of GROMOR ACCELERATOR).

9. SEEDLINGS

Germinate and grow seedlings in GROMOR SEEDLINGMIX. "Feed" three times a week by watering them with a solution of one teaspoon GROMOR PLANT FOOD in 5 litres water.

10. THE ORGANIC OPTION

GROMOR LIME 100g/m² in winter, **GROMOR COMPOST** 1 bag to cover 5-10m² and **GROMOR ACCELERATOR*** at 150g/m² in spring and autumn.

*GROMOR ACCELERATOR CARRIERS ORGANIC ATTESTATION BY ECOCERT.

11. MULCH - GROMOR PINEBARK MULCH (or NUGGETS for smaller "beds" and pots), should be used to cover bare soil. It helps keep the soil moist, providing a healthier environment for beneficial "soil life", as well as suppressing weed growth.

RULE OF THUMB:

A heaped handful of GROMOR fertilizer weighs ±30 grams. Pacing up and down an area in lines one pace apart and throwing a handful of fertilizer in a wide arc into the air for every pace taken, will apply ±30g/m² which equals ±300kg/ha.

1 litre GROMOR ACCELERATOR ±500g

1 cup GROMOR ACCELERATOR ±120g

1 handful GROMOR ACCELERATOR ±20g

GROMOR COMPOST is a quality **ORGANIC** product made from selected weed free materials including chicken litter, horse manure, straw, kraal manure etc. During the composting process, temperatures of 60°C are reached, ensuring that harmful pathogenic organisms are killed. Once mature, the odourless, clean handling, fluffy compost is screened and bagged. APPLICATION RATE: 1 bag to cover 5-10m², in spring and autumn.

GROMOR POTTING MEDIA. Because of the limited root space in containers, GROMOR POTTING MEDIA is blended to have a good nutrient balance suitable for a wide variety of plants. It is stable and has good aeration and water holding properties. GROMOR POTTING MEDIA is pre-enriched to provide sufficient nutrients for approximately 2 months, after which feeding with a soluble pot plant food should be regular practice. e.g. Water weekly with a solution of 1 teaspoon GROMOR PLANT FOOD in 5 litres water. In between the weekly liquid feed, apply straight water.

GROMOR ACCELERATOR organic fertilizer pellets which are comprised of actively, aerobically composted chicken litter, have a slow release action in the soil. It contains the full range of "plant food" elements, but even more importantly, is its ability to stimulate soil microbial life, to unlock tied up nutrients from the soil and atmosphere. Being a balanced organic fertilizer, GROMOR ACCELERATOR is suitable for all plants, including lawns, shrubs, trees, vegetable and flower beds, as well as field crops.

Directions for use:

1. Apply 150g/m² of GROMOR ACCELERATOR in Spring and Autumn, raking it lightly into the soil. Avoid digging it in deeper than 15cm.
2. For planting holes, mix 300g GROMOR ACCELERATOR with the soil in the hole.

A 1 litre can of GROMOR ACCELERATOR weighs ±500g, 1 cup GROMOR ACCELERATOR ±120g, 1 handful GROMOR ACCELERATOR ±20g.

NB: To get the maximum out of any "organic", requires a good calcium and magnesium status in the soil. As a rule of thumb, apply 100g/m² of GROMOR LIME per annum, avoiding areas where acid loving plants are grown.

GROMOR ACCELERATOR carries ORGANIC ATTESTATION by ECOCERT.

GROMOR INDIGENOUS PLANTING MIX, has been formulated to eliminate the hassle of having to use an array of fertilizers and composts when planting or fertilizing indigenous shrubs and trees. Simply mix a bag of GROMOR INDIGENOUS PLANTING MIX with the soil in the planting hole, or dig it in lightly around indigenous plants. One bag to cover 5m².

GROMOR PINEBARK MULCH. Whilst having little plant food value, GROMOR PINEBARK MULCH, when used to cover bare soil, will stabilize soil temperature, improve water retention and suppress weed seed germination. Nature doesn't like bare ground and will work hard at covering it, unfortunately mostly with weeds! Help nature by covering bare ground with GROMOR PINEBARK MULCH.

GROMOR PINEBARK NUGGETS, make an attractive MULCH for POTPLANTS and "SHOW BEDS".

GROMOR ROSE STARTER has been formulated to eliminate the hassle of using an array of fertilizers and composts when planting and fertilizing roses. When planting, simply mix one bag of GROMOR ROSE STARTER with the soil in the planting hole

. For established roses, apply a bag of GROMOR ROSE STARTER to each bush in early spring and late autumn.

GROMOR LAWN and ACID DRESSING. An early spring and autumn application of GROMOR LAWN, ROSE or ACID DRESSING at one bag to cover 10m², will form an excellent foundation for lawns, roses and acid loving plants respectively.

GROMOR KRAALMANURE has become a scarce commodity, being largely replaced with compost. Application rate 1 bag/10m².

GROMOR SIFTED CHICKEN LITTER. GROMOR ACCELERATOR has largely replaced the use of CHICKEN LITTER in the garden. GROMOR SIFTED CHICKEN LITTER is an excellent 'compost activator' (50g/litre material to be composted). It can also be applied directly to the soil at 1x100dm³ bag per 20m²

GROMOR SEEDLINGMIX is blended from composted screened pinebark and coir fibre to which a balanced starter fertilizer charge is added. It is ideally suited for germinating and growing seedlings in seed trays. Tip out the contents of the bag and fluff up the SEEDLINGMIX, allowing it to aerate for 24 hours before wetting (moist NOT soggy) and filling seed trays. Always water delicate seedlings with a fine spray and feed 3 times a week, by watering with a nutrient solution of 1 teaspoon GROMOR PLANT FOOD in 5 litres water.

ROSES

SITE: Select a site with plenty of morning and afternoon sun. Don't expect to grow roses on the shady south side of an avenue of trees or wall.

PLANT HOLES: Roses like a good, well drained loam soil. The poorer your soil the bigger the planting holes should be. The general recommendation is to dig SQUARE planting holes 300mm wide and knee deep (NOT round). If one is going to water and fertilize regularly, smaller holes will suffice. For bigger plantings, dig a trench with similar dimensions. Fill the holes/trench with a mixture of the TOPSOIL (NOT SUBSOIL) removed and **GROMOR ROSE STARTER** at 1 bag per 5m² of trench or 1 bag per planting hole.

PLANTING: In frost free areas, one can plant all year round. In frosty areas, plant from September to January. It is preferable to plant young healthy roses growing in nursery bags, rather than older transplanted or open rooted ones.

Half fill the planting hole with the "TOPSOIL/ROSE STARTER mixture" and water. Remove the "nursery bag" from the rose bush, leaving roots as intact as possible and place in planting hole. Fill hole with the balance of the "TOPSOIL/ROSE STARTER mixture" and firm down. When planting, don't allow roots at the bottom of the plant bag to bend upwards – rather trim if necessary. In the case of grafted roses, cover the "bud union" with soil. Press the soil down firmly, water thoroughly and drench for termites next to the stem and over the "bud union".

WATERING: Roses thrive on heavy watering and feeding, provided drainage is good. Water twice per week in summer months and once a week for the rest of the year.

MULCHING: Cover bare soil around the rosebushes with GROMOR PINEBARK MULCH, to prevent prolific weed growth, stabilise soil temperature and conserve moisture. For "features", GROMOR PINEBARK NUGGETS makes an attractive mulch.

FEEDING: In early spring, "fork" in lightly 1 bag GROMOR ROSE STAR-TER for every 2 rose bushes and thereafter fertilize every 2 months, alternating with **GROMOR 5.1.5(28)** at 20g/square metre and **GROMOR ACCELERATOR** organic fertilizer pellets at 150g/m².

PRUNING: In **frost free** areas, try "green pruning". In **frosty** areas, prune in July. With early pruning, one runs the risk of new growth being "burnt" by late frosts.

GROMOR ACCELERATOR ORGANIC FERTILIZER PELLETS

GROMOR ACCELERATOR ORGANIC FERTILIZER PELLETS carry ECOCERT SA (F-32600) and NOP organic accreditation (attestation number 990ZA0600n1e), making it suitable for organic farming according to EEC 2092/91 Annex IIA. i.e. it can be used to grow organic produce destined for the Europe and USA.

The pelleting process ensures the "slow release" of plant nutrients in the soil, avoiding the "boom and bust" scenario, common with conventional fertilizers.

GROMOR ACCELERATOR contains the full range of "plant food" elements, but even more important, is that being organic, it stimulates soil microbial life to unlock nutrients from both the soil and atmosphere.

One must accept that no two samples of any "organic" are identical. The table below gives a conservative analysis, that does not take into account nutrients made available through stimulation of the soil food web.

Kinsey in his book "Hands on Agronomy", estimates that composted poultry litter (the base for GROMOR ACCELERATOR) will make available to plants, twice the amount of phosphate and potassium it contains. Furthermore, stimulating the soil food web can also make an extra $\pm 50\text{kg/ha}$ of Nitrogen available in soil with 3,5% OM.

Analysis on Dry Matter Basis

| | g/kg: | | g/kg | | mg/kg | | mg/kg |
|---|-------|----|------|----|-------|----|-------|
| N | 30 | Mg | 5 | Fe | 5000 | B | 40 |
| P | 15 | Ca | 30 | Cu | 40 | Mn | 400 |
| K | 15 | S | 6 | Zn | 320 | Mo | 4 |

The heat generated in composting and during the pelleting process, ensures pasteurisation of pathogens and sterilisation of weed seeds. Being a balanced organic fertilizer, GROMOR ACCELERATOR is suitable for all plants, including lawns, shrubs, trees, vegetable and flower beds, as well as field crops.

Whilst it is tempting to "spike" the pellets with chemical fertilizer, organic certification would then not be possible. Furthermore, we would rather you got the full benefit from a totally organic pellet, than one where approximately half is comprised of chemical fertilizer, that does not benefit from the pelleting process. If need be, use inorganic fertilizer separately.

DIRECTIONS FOR USE:

1. Apply 150g/m^2 of GROMOR ACCELERATOR in Spring and Autumn, raking it lightly into the soil. It is not necessary to dig it in deep.
2. For PLANTING HOLES, mix 300g GROMOR ACCELERATOR with the soil in the hole.
3. For TREES, apply 150g/m^2 GROMOR ACCELERATOR around the drip area annually.
4. For LAWNS and MULCHED areas, sprinkle 150g/m^2 GROMOR ACCELERATOR and allow it to sift slowly down to the underlying soil. Two applications are ideal – one in early spring and one in late summer.
5. For FIELD CROPS, disc in $1,500\text{kg/ha}$ of GROMOR ACCELERATOR before planting or place 1500kg/ha in the planting row. (GROMOR ACCELERATOR must not be in direct contact with the seed).
6. RULE OF THUMB:
1 litre can of GROMOR ACCELERATOR $\pm 600\text{g}$.
1 cup of GROMOR ACCELERATOR $\pm 140\text{g}$.
1 handful of GROMOR ACCELERATOR $\pm 20\text{g}$.

NB: To get the maximum out of any "organic" requires a good calcium and magnesium status in the soil. As a rule of thumb, apply 1-ton lime/ha/annum (100g/m^2), avoiding areas where acid loving plants are grown.

GROWING MEDIA

There are good and bad growing media. Fortunately, one does not require the best growing media to grow good plants. Perfectly good plants can be grown in a host of different media, provided one adapts the watering and feeding management.

When deciding on a growing media, consider the following:

1. Is it cost effective?
2. Is the quality consistent?
3. Is it a renewable resource?
4. Are other growers growing successfully in the media?
5. Is it readily available?
6. Does it suit my infrastructure and management?

Growing media falls into two broad categories.

1. INORGANIC MEDIA

- (a) Sand – cheap, heavy to handle in growing bags; prone to pathogens and should be sterilized.
- (b) Perlite – expensive; sterile; ideally suited to some sophisticated potting systems.
- (c) Vermiculite – expensive; sterile; best suited for germinating seedlings, prone to going “pasty” with time and pH goes too high” with repeated use.
- (d) Expanded volcanic rock, rockwool, “oasis”: - expensive; sterile; of limited use.
- (e) Clinker – cheap but really only suitable as a filler with other media.
- (f) Gravel – used in gravel beds, fed with a recirculating hydroponic solution.
- (g) Clay pellets – expensive, sterile.

2. ORGANIC MEDIA

- (a) Sphagnum peat – expensive; sterile; an excellent growing media, but not a renewable resource.
- (b) Cocus – expensive; sterile; renewable resource, but with its high water holding capacity and propensity to lock up calcium and magnesium, it is more suitable as a part constituent of growing media, rather than on its own. Some sources are high in salt. Check EC before using. Should be <1,5.
- (c) Softwood sawdust and shavings – cheap; sterile; renewable resource, but with its propensity to decompose, with associated nitrogen drawdown implications, it has no use in the nursery. It is popular in commercial tunnel production for growing tomatoes, cucumbers, peppers and brinjals in bags, that are fed regularly throughout the day with a “complete” hydroponic nutrient solution.
- (d) Composted pinebark – relatively cheap renewable resource – the heat generated during composting (>50°C) will kill most pathogens; a readily available resource of fairly consistent quality. With the exception of the Western Cape, composted pinebark is the most convenient growing media base, for container growing in the RSA.

When considering a growing media, there are some standards that should be taken into account:

1. Water holding capacity. Measuring Air Filled Porosity (AFP) is probably the most practical way of determining this. It measures the percentage volume of water that will drain out between saturation and field capacity. This is equal to the amount of air that the media will hold at field capacity.
 - At AFP>35% the media is very “open”, drains quickly and requires very regular watering – at least daily. e.g. coarse river sand, gravel, pinebark nuggets.
 - AFP15% - 35% drains well, requires reasonable watering. e.g. screened composted pinebark.
 - AFP<15% - prone to waterlogging. e.g. clay, some fine cocus.As the AFP decreases, watering frequency must be extended to avoid waterlogging and oxygen deprivation.
As AFP increases, watering frequency must be shortened to avoid drying out. (For more on AFP read; Growing Media by KA Handreck and ND Black; UNSW Book – ISBN 0 86840 333 4)
2. Electrical Conductivity (EC) as measured in ds/m. EC measures the “salt” level in the media and should be below 1,5 before fertilizer is added.
NB: Plant food elements (N, P, K, Ca, Mg etc) are in the form of “salts” measured by EC. (EC is relatively simple to measure. Dilute the media in a 2:1 (2 water 1 media) solution of water (preferable distilled, but tap will do – NOT dam or borehole!) soak for 20 minutes, filter through cloth and read EC of solution).
*Media EC>1,5 before adding fertilizer, generally indicates high sodium chloride (NaCl) levels, harmful to plant growth.
NB: sodium chloride (NaCl) is common salt.
3. pH. pH measures the acidity of the media and should be in the 5,6 to 6, 4 range. NB: Most laboratory pH measurements are KCl, whilst most handheld meters’ measure water pH. Water pH is ±1 point higher than KCl pH i.e. a lab pH (KCl) of 5, 4 will equate to a handheld pH of ±6, 4 (water).

(NB: AFP is a physical measurement that one can learn to estimate by “feel” reasonably well. EC and pH tell one in broad parameters, the chemical status. EC and pH measurements are essential and cannot be done by “feel” or looking at the media).

COMPOSTED PINEBARK BASED MEDIA

Let's accept that you're operating under economic constraints and have decided to use a composted pinebark based growing media. It would be nice to have an abundant supply of mature "corky" pinebark from species other than *Pinus patula*. Unfortunately, the vast majority of bark available comes from paper mills, characterized by young trees with a high proportion of *Pinus patula*, with lots of cambium. It's not ideal, but certainly not impossible to work with.

In its raw state, pinebark has a low pH (<5) and contains resins and tannins, which may negatively effect growth. Active composting eliminates this.

Once composted and mature, it is screened into different particle sizes.

1. For germinating fine seed and/or plug production, a fine media with a good water holding capacity is called for i.e. <4mm. 10%-20% cocus can be added.
2. For container growing in bags or pots, where good watering facilities are available, coarser (<12mm) composted pinebark mixed with $\pm 20\%$ riversand is recommended.
3. Where pots are in danger of dying out, $\pm 20\%$ riversand will facilitate the "spreading" of water in the pots when re-wetting. An organic media like bark, becomes hydrophobic when dry and water "tunnels" through without wetting, when trying to re-wet it. A percentage of sand counteracts this problem i.e. it acts as a water "spreader" in the media.
4. Composted pinebark is light and thus easy to handle when moving pots. Unfortunately, the lightness means that containers easily topple over – a percentage of riversand rectifies this problem.
5. Neither composted bark or sand have a particularly high cation exchange capacity (cec), making regular feeding necessary. A weekly watering with a complete hydroponic fertilizer e.g. GROMOR 3.1.3 (37) ws complete at 1g/l will suffice for most ornamental container plants. This does however not apply for intensive tunnel production.
6. For householders who often do not water or feed regularly, the addition of 20% riversand to the composted bark, makes a more "forgiving" media, with adequate moisture and nutrient holding properties.
7. Composted pinebark with the "fines" screened out i.e. leaving a medium with particles sizes ranging from $\pm 12\text{mm}$ to $\pm 25\text{mm}$, looks very promising for replacing gravel in gravel beds.

Having decided on what growing media to use, one now needs to match the watering schedule and fertilizer.

FERTILIZING

- a) Applying straight, dry chemical fertilizer to containers is generally not a proposition. It's very difficult to apply accurately and results in undesirable EC swings in the media. (if done, use GROMOR 5.1.5 (28) or GROMOR ACCELERATOR ORGANIC FERTILIZER PELLETS both of which have a slow release action.)
- b) Fertilizing with a complete hydroponic fertilizer GROMOR NEW GENERATION COASTAL BLEND and GROMOR CALMAG N), diluted to make up the desired nutrient solution. This method of fertilizing is done through the watering system and can be accomplished in various ways:
 - i. Watering from a reservoir to which the hydroponic fertilizer has been added to make up the desired nutrient solution. This is a simple way and avoids the problems associated with concentrate solutions, injectors etc.
 - ii. Concentrate solutions and Injectors. A small concentrate solution is made and fed into the watering line via an Injector. The "mix nozzle" is another version of this system, where a Venturi replaces the Injector. Concentrate solutions should never be stronger and then 1kg/20 litres water and must NOT contain calcium and phosphate in the same concentrate solution. Concentrate solutions should be freshly mixed each week.

NB:

1. Don't mix PHOSPHATE and CALCIUM in the same CONCENTRATE solution. You can however get away with it in the final DILUTE nutrient solution fed to plants.
2. Make sure pH of raw water is UNDER pH 6,4 BEFORE adding fertilizer. If over 6,4 add 125ml NITRIC ACID per 1000l water and repeat if necessary to bring water pH to under 6,4 BEFORE adding fertilizer.
3. Take care when selecting a fertilizer.
 - (a) For intensive undercover production, a 2-part complete water soluble fertilizer is required. The one part contains the PHOSPHATE and other nutrients (macro and micro) but NOT CALCIUM. The other part contains the CALCIUM but NOT PHOSPHATE. The phosphate and calcium source are only combined in the final dilute nutrient solution as fed. (calcium and phosphate in a concentrated solution will precipitate, rendering nutrients unavailable to plants and block the system).
 - (b) A single bag of "COMPLETE" fertilizer (e.g. GROMOR 3.1.3 (37) ws complete) is a misnomer, as it does not contain calcium. It is therefore not suitable for intensive undercover production. It is suitable for growing nursery stock in a Growing Medium pre-enriched with CALCIUM. In such a system a nutrient solution made up of Gromor 3.1.3 (37) ws complete diluted at 1g/l water can be irrigated once to 3 times per week depending on the growth required. Whilst a dilute solution (e.g. EC < 1,2,) can be continuously applied at each watering, it is more common under nursery conditions to give a thorough watering with a nutrient solution once to three times per week.

FOLIAR FEEDING

Foliar feeding cannot replace a sound fertilizer programme. It can however play a useful supplementary role in stimulating growth, flowering and fruiting, when stress causes poor nutrient uptake via the roots.

A variety of causes can be responsible for stressed growing conditions: unsuitable soil/growing media (high or low pH and/or conductivity, waterlogging, dry conditions, nutrient imbalances etc), inclement weather (cold, heat, high humidity), pests, diseases, heavy fruiting etc.

While foliar feeds can be used to counter specific problems, they are often resorted to when no specific reason can be found for unsatisfactory growth or fruiting.

DANGER! There is always the danger of foliar burn, particularly when the foliar spray contains nitrogen and potassium e.g. Potassium Nitrate, Magnesium Nitrate, Calcium Nitrate.

Spray in the cool of the day, preferably after rain or irrigation when plants are turgid and growing actively. Avoid spraying in heat or when plants are wilting, making them predisposed to leaf burn. (NB: An early morning spray, up to two hours after sunrise ensures the least chance of spray burn).

Monitor both the EC and pH of the foliar spray, ensuring an EC close to 2m μ and pH in the 5, 6 to 6,4 range.

In Greenhouses, the time of spraying is particularly important in summer, as plants are UNABLE to absorb foliar nutrients when temperatures exceed 30°C.

In winter on the other hand, it is advisable to delay spraying until it warms up a little, as foliar nutrient uptake is negligible at temperatures under 15°C.

A general spray, concentrated over the top 60cm of the plant is usually adequate.

Use clean water and always add a wetter/sticker/buffer, which must be put into the water BEFORE the foliar feed.

Spray weekly in times of stress.

Because leaf stomata are surrounded by fine hairs which prevent the entry of large droplets, foliar sprays must be a FINE MIST ensuring a droplet size small enough to gain entrance.

Different element deficiencies manifest themselves at different growth stages. These deficiencies can be met with standard hydroponic fertilizers as shown below. The elements most likely to be deficient in the three general stages of growth are:

EARLY GROWTH STAGE (i.e. first \pm 40 days)

Phosphate, Iron, Manganese, Copper, Magnesium, Molybdenum and Zinc (GROMOR NEW GENERATION COASTAL BLEND contains all these elements). Foliar spray solution 1g/l water.

RAPID GROWTH STAGE

Nitrogen, Potassium, Sulphur, Molybdenum and Magnesium (GROMOR NEW GENERATION COASTAL BLEND contains all these elements). Foliar spray solution 1g/l water.

FRUITING

Calcium and Boron (GROMOR CALMAG N contains these elements) Foliar spray solution 1g/l water.

It is always advisable to include a WETTER at 1ml/litre water, to any foliar spray solution. Add it first, before the foliar spray.

CUSTOMISED FOLIAR SPRAYS

There are a number of customised foliar sprays available on the market containing not only plant food elements, but also growth stimulants like Brassinolide (claimed to improve flowering and fruiting), worm wee etc etc.

If you do use foliar sprays, it is probably advisable that they contain the basic plant food elements N, P, K, Ca, Mg and micro elements, as well as the growth stimulants.

FREQUENCY OF FOLIAR SPRAYING

Whilst some customised foliar spray recommendations only advise to spray at strategic times e.g. REACH UUP – at flowering and thereafter monthly. If in doubt, spray weekly.

SEEDLING PRODUCTION

Composted pinebark forms the base for the different growing media produced by Gromor.

For SEEDLING production use GROMOR SEEDLINGMIX.

GROMOR SEEDLINGMIX

"GROMOR Seedling mix" is a pre-enriched blend of "GROMOR Fine Composted Pinebark" and Coir Fibre, with good water holding properties.

FEEDING SEEDLINGS

GROMOR SEEDLINGMIX is pre-enriched with a small charge of macro and micro elements, to carry the seedlings through the first few weeks after germination.

With regular watering, small plugs and a well drained medium, nutrients are unfortunately leached out. To ensure ongoing strong, healthy seedling growth, most growers therefore feed regularly after the 2 leaf stage.

Either irrigate continuously with a dilute solution of 0,5g GROMOR 3.1.3 (37) WS Complete per litre water or give 2 to 3 irrigations per week with a solution of 1g GROMOR 3.1.3 (37) WS Complete per litre water.

Check the pH of the irrigation water before adding fertilizer, as it will precipitate and make the plant nutrients unavailable if the water pH exceeds 6,4. If in doubt, use acid (nitric or phosphoric acid) to reduce the pH to acceptable levels (5, 4 to 6, 4) BEFORE adding fertilizer.

FILLING SEEDTRAYS

Being organic, composted pinebark media including seedlingmix, exhibits hydrophobic properties if allowed to dry out, which can lead to the uneven distribution of water when seed trays are filled with DRY media. Thoroughly wetting the medium before filling trays eliminates this. Twenty-four hours BEFORE filling seed trays, empty the bags of media onto an impervious surface, fluff up and moisten the contents.

“GROMOR CHICKEN LITTER PUTS LIFE BACK INTO TIRED SOIL”

GROMOR Chicken Litter packed in 100dm³ (40kg) bags is registered as an organic fertilizer (Reg No B124) under Act 36 of 1947.

Broiler chickens are grown out on bedding material (sunflower husks, shavings or wheat straw) placed on the floor of environmentally controlled houses. Meticulous management and feeding practices ensure that the litter (bedding material and droppings) is of high standard and relatively dry.

GROMOR Chicken Litter being organic ensures many advantages.

- Stable plants nutrients in organic form.
- Gradual release of nutrients over the growing seasons. Manures are nature's “slow release” fertilizers.
- Increased micro-organic activity increases humus formation, which improves cation exchange capacity, soil structure, aeration and water holding capacity.
- Improved soil mineralization, unlocks plant nutrients locked in the soil, making them available for plant growth.
- The full spectrum of trace elements is present.

GROMOR Chicken Litter, which is weed free, is suitable for use on all soil types and most crops.

Being organic, it would be folly to guarantee an exact analysis. However, due to consistent management practices, the analysis of GROMOR is surprisingly stable. Guidelines on which to work are given below.

| | | | |
|----------------|-------|-----------------|----------|
| Nitrogen (N) | 3, 0% | Iron (Fe) | 1000 ppm |
| Phosphate (P) | 1, 5% | Copper (Cu) | 20 ppm |
| Potassium (K) | 1, 5% | Zinc (Zn) | 215 ppm |
| Calcium (Ca) | 2, 1% | Boron (B) | 40 ppm |
| Magnesium (Mg) | 0, 5% | Manganese (Mn) | 320 ppm |
| Sulphur (S) | 0, 6% | Molybdenum (Mb) | 4 ppm |

The recommended application rate which varies according to crop, climate and soil type ranges from 2 to 5 tons/ha. A standard application of 4 tons (10m³) per ha, topped up with chemical fertilizer where required to meet desired NPK levels, has proved popular.

Plant nutrients from organic fertilizers like GROMOR, are made available through the action of micro-organisms. For best results, a light incorporation (NOT DEEP) into a moist soil is recommended.