



- Safe Earth Lawn & Garden –
    - Founded in 1992 after original owner’s pet was killed by lawn chemicals
    - Our focus remains on finding solutions for turf problems not using dangerous chemicals.
    - Now offer snow and greenhouses, working on our own retail line of turf products
- Why? Safety for children pet, and us.

### What is organic?

- Define

A system of cultural practices that eschews the use of chemical fertilizers, pesticides, and herbicides. Instead, gardeners work with the more natural materials, such as compost, mulch, and natural predators to nurture plants and control pests and diseases, all while minimally affecting the environment.

### Why organic?

- Safety -  
Presidents Panel on Cancer

\*Children Are at Special Risk for Cancer Due to Environmental Contaminants and Should Be Protected. Opportunities for eliminating or minimizing cancer-causing and cancer-promoting environmental exposures must be acted upon to protect all Americans, but especially children. They are at special risk due to their smaller body mass and rapid physical development, both of which magnify their vulnerability to known or suspected carcinogens, including radon. Numerous environmental contaminants can cross the placental barrier; fo is a disturbing extent, babies are born "pre-polluted." Children also can be harmed by genetic or other damage sustained by the mother (and in some cases, the father). There is a critical lack of knowledge and appreciation of environmental threats to children's health and a severe shortage of researchers and clinicians trained in children's environmental health.\*

- Table salt LD50 is 3000-5000 mg/kg  
Green Guardian LD50 15,000 mg/kg
- Chemicals treatments usually treat only the symptoms
- Organic care helps condition the soil. It helps to stimulate microbial activity which is the way it works in nature - think chiropractic

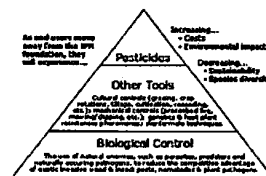
### Start with the basics

- Good soil  
What is it?
- Depends what your trying to grow
- Good soil is one with an optimum level of nutrients, organic matter, compaction/texture and pH

### Integrated Pest Management (IPM)

#### What is it?

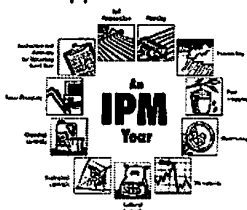
Integrated Pest Management (IPM) is an effective and environmentally sensitive approach to pest management that relies on a combination of common-sense practices. IPM programs use current, comprehensive information on the life cycles of pests and their interaction with the environment. This information, in combination with available pest control methods, is used to manage pest damage by the most economical means, and with the least possible hazard to people, property, and the environment.



### How does IPM work

- IPM is not a single pest control method but, rather, a series of pest management evaluations, decisions and controls. In practicing IPM, growers who are aware of the potential for pest infestation follow a four-tiered approach. The four steps include:

- Set Action Thresholds
- Monitor and Identify Pests
- Prevention
- Control



### Set Action Thresholds

Before taking any pest control action, IPM first sets an action threshold, a point at which pest populations or environmental conditions indicate that pest control action must be taken. Sighting a single pest does not always mean control is needed. The level at which pests will either become an economic threat is critical to guide future pest control decisions.

- Eg-grubs

## Monitor and Identify Pests

Not all insects, weeds, and other living organisms require control. Many organisms are innocuous, and some are even beneficial. IPM programs work to monitor for pests and identify them accurately, so that appropriate control decisions can be made in conjunction with action thresholds. This monitoring and identification removes the possibility that pesticides will be used when they are not really needed or that the wrong kind of pesticide will be used.

Eg-grubs are present in all lawns but not all lawns display grub damage

## Prevention

As a first line of pest control, IPM programs work to manage the crop, lawn, or indoor space to prevent pests from becoming a threat. In an agricultural crop, this may mean using cultural methods, such as rotating between different crops, selecting pest-resistant varieties, and planting pest-free rootstock. These control methods can be very effective and cost-efficient and present little to no risk to people or the environment.

Eg-Organic and chemical prevention and deterrents are available. Apply mid-August

## Control

Once monitoring, identification, and action thresholds indicate that pest control is required, and preventive methods are no longer effective or available, IPM programs then evaluate the proper control method both for effectiveness and risk. Effective, less risky pest controls are chosen first, including highly targeted chemicals, such as pheromones to disrupt pest mating, or mechanical control, such as trapping or weeding. If further monitoring, identifications and action thresholds indicate that less risky controls are not working, then additional pest control methods would be employed, such as targeted spraying of pesticides. Broadcast spraying of non-specific pesticides is a last resort.

Eg-Organic and chemical treatments apply in early – mid spring and late summer

## Work with nature

A preventive health care program for your lawn should have the following steps:

1. Develop healthy soil
2. Choose a grass type that thrives in your climate
3. Mow high, often, and with sharp blades
4. Water deeply but not too often
5. Correct thatch build-up
6. Set realistic goals

## Healthy Soil

Good soil is the key to healthy lawn

PH is key 6.5 – 7.0 is ideal.  
pH affects soil biology and micro-organism life, besides limiting turfs ability to take in nutrients

Practically all lawns are N-P-K deficient



## Star Player - Bacteria

### Bacteria

- are single celled
- capable of producing 16 million more in just 24 hours
- live in close proximity to plant roots
- live in soil water, including the film of moisture surrounding soil particles, and some are able to swim
- Aerobic bacteria require oxygen and are most active in a soil that is moist (but not saturated, as this will deprive aerobic bacteria of the air that they require), and neutral pH, and where there is plenty of food (carbohydrates and micronutrients from organic matter) available.
- Actinobacteria are critical in the decomposition of organic matter and in humus formation, and their presence is responsible for the sweet "earthy" aroma associated with a good healthy soil. They require plenty of air and a pH between 6.0 and 7.5, but are more tolerant of dry conditions than most other bacteria and fungi.
- Anaerobic bacteria do not require oxygen and tend to cause putrefaction of dead organic matter



## Star player- fungus

• Many fungi are parasitic, often causing disease to their living host plant (fairy rings), although some have beneficial relationships with living plants.  
• In terms of soil and human creation, the most important fungi tend to live on dead or decaying organic matter, thus breaking it down and converting it to forms that are available to the higher plants.

### Mycorrhizal fungi - think truffles

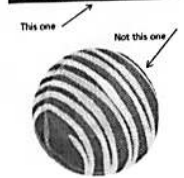
• we able to "fix" nitrogen from the air and make it available to plants. Some plants and trees cannot grow if deprived of specific microbes (mycorrhizal fungi) around their roots. That's why some plants need a good doseful of additional soil from around their roots for company when transplanting.  
• live symbiotically with living plants, creating a relationship that is beneficial to both, we known as mycorrhizae.

• Plant root hairs are attracted by the mycelia of the mycorrhizae, which lives nearby in the soil and partly in the root.  
• The mycorrhizae obtains the carbohydrates that it requires from the root, in return providing the plant with nutrients including nitrogen and moisture.  
• Later the plant roots will also absorb the mycelium into its own tissues.  
• Beneficial mycorrhizal associations are to be found in many of our edible and flowering crops (including tomatoes and potatoes), as well as the majority of tree species, especially in forest and woodlands.

• True forests, a young seedling cannot obtain sufficient light to photosynthesize for itself and will not grow properly in a sterile soil. But if the ground is underlain by a mycorrhizal mat then the developing seedling will draw down roots that can link with the fungal threads and through them obtain the nutrients it needs, often indirectly obtained from its parents or neighbouring trees.

PH balance - pH balance is critical for optimum mycorrhizal activity. The pH range of your soil should be within the proper range of your grass. Bermuda grass needs a range of 6.5 to 8.0, eye grass should be grown in a range of 6.0 to 7.0, and blue grass prefers a range of 5.0 to 6.4.

• Compaction - neglected black dirt or, more commonly, clay. Compaction can militate much of mycorrhizal activity above. Nutrients often get washed out of the soil by rainwater. Grass needs nitrogen, phosphorous and potassium for optimal growth. Use a fertilizer in the spring high in nitrogen to promote healthy soil and grass.



## Soil issues

• **Clay Soil**  
Clay soils tend to have a high plant nutrient content, but they are both difficult to water & hard to dry out, low in oxygen. Very dense and wont allow sufficient root growth. Can be improved by cultivating the soil and adding gypsum (clay breaker) or organic material such as loam soil. Loam soil is made up of 40 percent sand, 40 percent silt and 20 percent clay. By having these percentages of soil types in your yard, you will have soil that is not water logged or dry.

• **Sandy Soil**  
Sandy soils usually have excellent drainage and low nutrient levels. They are also susceptible to wind and rain erosion. They can be improved with organic matter.

• **Rocky Soil**  
Rocky soils can't be cultivated and are usually very low in plant nutrients. In this situation the cheapest option may be build garden beds on top of the existing soil. This can be done by importing soil to the site or by using the No Dig gardening method. Simply build up the soil by laying down layers of organic material such as compost, newspapers and lawn clippings.

• **Improving Soil Fertility**  
Plants need nutrients to grow; and any soil can lose its supply of nutrients over time if you don't replenish them. The best way to do this is to keep adding compost, manure, or mulch - every year, if not more often. As these materials decompose, they release nutrients, maintaining a high level of soil fertility.

Fertilizers should be used as well, to supplement or top up the plants' nutrient requirements. Don't depend totally on fertilizer though: it just isn't enough in most cases. Inorganic fertilizers can also cause environmental damage when used over long periods.

### Cultural Practices

Such as:

- Grass Cultivar
- Mowing height and thatch
- Watering
- Fertilizing - *spring & fall - skip summer since grass isn't growing*
- pH
- Compaction
- Organic matter content

### Choose the right grass type

Does it make sense to plant a cactus in Iowa?

Bluegrass is the most popular but is delicate. Great for direct sun but requires mild temperatures and requires lots of water

Rye is characteristically similar to Bluegrass but much tougher

Fescue has finer blades, but much better suited to shade

Turf needs to be maintained

### Mowing

Ideal height is 3"

Mower blade should be sharp. Dull blades tear rather than cut

Never remove more than 1/3 of the blade height at once

Mulch clippings but monitor pH to ensure optimum soil conditions

### Thatch correction

Thatch over 1/2" prevents moisture and nutrients from reaching the soil

Overuse of fertilizer or chemical

Ph!

Aeration

## Watering

Deeply and infrequently. Top 6"–8" should be moist when watering "deeply", then let the soil dry out.

In moderate temperatures lawns need about an inch per week. Best if done in early morning to minimize evaporation and reduce tendency for fungal growth

Lawn needs water when:

Temperatures turn hot  
does not recoil from being stepped on

## Does it really (organic) matter [pH, Compaction & Organic Matter]

- pH should ideally be 6.5 – 7.0 and will change throughout the season
- Typical turf is far too compacted to allow turf grass to thrive. Aerate every year if possible.
- When aerating, also try to add a good source of organic matter like compost via topdressing

## Realistic goals

Healthy lawns are not weed free

No place on earth will you find naturally occurring stands of grass that are 100% weed free

Did you know a lawn that contains as much as 15% weeds appears to be practically weeds free to an onlooker?

## Products

- Green Guardian



Glechoma hederacea after 1 – 3 week course of treatments

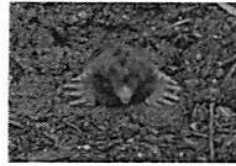
### Organic Pre-emergent control

Corn Gluten Meal  
Corn Gluten Hydrolysate



Chief component in many livestock and pet feeds

### Mole control



Castor Oil

### Raccoon, grub & mosquito repellent

"Blistering Defense"

garlic  
white pepper  
soybean oil  
adjuvant



### Milorganite



## Lime and Sulphur



Pelletized or Pulverized, Ideal for raising soil pH



Best choice for lowering pH



# SafeEarth

LAWN & GARDEN

Organic and Natural Turf & Garden Care  
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