

The answer lies in the soil

Symbio's Martin Ward says that pesticide legislation is inevitable and that using natural defence mechanisms to improve soil quality will pay huge dividends

WORRIED about the EU vote on proposals to reduce pesticide use, which looks set to involve sports turf managers in a major rethink of their management practices?

A Chinese saying is "Without change there is no profit" so irrespective of new pesticide regulations now is an excellent time to look at ways to improve the health of your sward and reduce chemical inputs.

Virtually all today's sports turf managers have been trained to produce excellent playing surfaces using the inorganic fertilisers and pesticides available, understandably the threat of the tools of the trade being removed causes consternation and a belief that it will be impossible to produce the results demanded by the customer without them.

One argument however is not about the harm pesticides do to the sports turf environment, but are the current levels of pesticide use needed in the first place.

COMMON wisdom insists that traditional turf management requires ammonium sulphate for primary nutrition and ferrous sulphate to "harden" the turf.

This practice started in the 1920s when factories for making ammonium sulphate by passing ammonia through sulphuric acid at 800°C came into production. The use of inorganic salts for primary nutrition contaminates the soil and weakens the grass.

In the 1930's fusarium became a big problem and fungicides were introduced. Fast growth and reduced biological activity encourages thatch build up.

Problems with water logging in winter and dry patch in summer, gave rise to the USGA specification sterile rootzone which was designed to remove water quickly not encourage the natural mechanisms that support plant

growth.

It is worth noting that when the USGA specification was developed mercury based fungicides and worm killers were freely available, so pesticides are much more environmentally friendly now.

Other side effects of contaminated, often waterlogged sterile rootzones was an increase in root eating nematode activity and a boom in soil living larvae and pupae, leatherjackets and chafer grubs being the most common in turf, as their natural soil predators could not survive.

Poor quality soil only supports quickly reproducing poa annua as the perennial grasses which produce the best playing surfaces die out. Poa annua has a short growing season and is susceptible to a wide range of diseases which leads to a cycle of nutrition, disease, pesticides, nutrition for which pesticide use is the only solution.

The solution under your feet

THE answer to life with reduced pesticide availability lies in understanding the conditions needed for fine grass growth and being able to encourage and used natural defence mechanisms against disease, insect damage and weeds.

Using natural defence mechanisms to your advantage will help develop an integrated pest management programme which not only substantially reduces reliance on chemicals, but also helps promote fine grass growth for better surfaces and more easily managed turf.

At Symbio we have spent 18 years helping turf professionals reintroduce the life in their soil to improve their playing surfaces by developing integrated pest management programmes.

Underground Activity

LET us look at how grass naturally survives. Plants photosyn-

thesise taking energy from the sun and carbon and nitrogen from the air, producing carbohydrates, proteins and sugars.

In grass about 50% of this energy goes into top growth, to feed the above ground food chain and 50% goes back into the soil via the roots and thatch to feed the underground mostly invisible food chain which converts this nutrient to plant available food.

To reduce the reliance on inorganic mineral salts the underground invisible food web must be cultivated to feed the grass, manage disease, prevent weeds and encourage the fine grasses needed for a good playing surface.

Free Nutrients

SIMPLY put, bacteria fix nitrogen from the atmosphere others take it from root exudates in the soil. Fungi and bacteria degrade thatch converting it to humus and humic acid and release locked up nutrients.

Trapped in a bacterial cell or fungal hyphae nitrogen is not available to the plant. The microbes have to be eaten by the next stage of the food chain comprising protozoa and nematodes.

Protozoa and nematodes eat the bacteria and fungi, they use the carbon to grow and excrete excess nitrogen as ammonium, which feeds the grass when converted to nitrate by nitrifying bacteria in aerobic soil.

It is common for green keepers that promote the soil food web to reduce nutrient inputs by more than 50% and many can go a whole season without needing fungicides, though it is very unusual to be fungicide free.

Mycorrhizal fungi play a very important role in fine grass growth. These fungi live in the roots and have a symbiotic relationship with the plant. They extend hyphae into the soil to extend the

effective root area allowing the plant to suck up more water and nutrients while providing a barrier to the pathogenic disease causing fungi.

To get the most from an integrated pest management programme you must create healthy soil to prevent problems, which is very different from reaching for the bottle to treat symptoms when problems arise.

It can take a whole season to clean up excess chemicals and develop healthy soil and several years for the grass species to change from poa annua to fine grass.

It looks like legislation will force the change. Whatever happens there will be a transition period of several years and it is best not to wait to the last minute but experiment when you still have recourse to pesticide treatments to ease the transition period.

All the elements of the soil food web can be introduced into any rootzone. We can now analyse soil to find out exactly what is present.

Bacteria and fungi can be introduced as a liquid or granular inoculant by itself or incorporated into organic or inorganic fertilisers. Mycorrhizae can be applied as an inoculant, premixed with our MycoGro fertilisers, or with seed, it can be premixed into the Johnsons range.

The higher elements nematodes and protozoa responsible for recycling nutrient and managing pests may be applied by making compost tea on site and spraying it through your usual sprayer.

The great advantage of reducing pesticides, inorganic nutrients and water is that bent, fescue and rye grasses are re-established for a better playing surface, while reducing consumable costs.

Symbio will be at Scotsturf and BTME. Further information and free site please contact Symbio Tel: 01428 685762, www.symbio.co.uk