Beneath the Surface of the Picton Garden

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The Picton Garden has changed and evolved since its creation in the 1980s. This evolution continues as we try to find places in the garden for the plants that we love and seem to find ourselves acquiring after visiting nurseries, plant sales and other such tempting places, and many of these acquisitions include spring flowering plants and bulbs. The structure of the garden was planted by Paul Picton for autumnal interest, but quite a lot of these trees and shrubs are fantastic in spring. So, clearing areas, moving small trees around and pushing the garden as close to the boundary fence as possible has helped open it all up a bit and allow our obsession to continue, giving the garden a longer period of interest.

I have looked after quite a few gardens in my career but none quite like this, it's a lot smaller than I'm used to and I don't have anyone to clear up after me anymore. I tend to always look at a garden from a management point of view - in other words how much work is involved to keep it looking great. I will always remember what one of my Head Gardeners might say to me if we were out visiting gardens or discussing the previous night's Gardening telly – "Look at awe they hedges boy! Ye wouldn'a want t' be cutten they every year." or some such observation about the upkeep of a property.

These days most big gardens are run with a skeleton staff and a small budget, so time management is essential, long gone are the days of plentiful cheap labour. The art of achieving a fantastic looking garden with minimum effort is a skill worth learning whether you have half an acre or a hundred acres. When I carry out a task I will always be thinking how I can streamline it, make it easier and quicker to perform? Trouble is, sometimes I may have to wait a whole 12 months until the following year before I can test it out and then, it may not even work. Doh!

Also, I am very aware of our environment and how we can affect it. I started out in conservation as a boy but somehow ended up on a horticultural career with my interest in natural history becoming more of a hobby. But my hobby has stood me in good stead and leads the way I manage a garden, whether my own or one I am employed to look after. I want to have a great looking garden but I also want it to be as sympathetic as possible to its ecology and the wildlife it contains.

Not only is the Picton garden open to the public and a showcase for the Nursery, it is also home to the Plant Heritage National Collection of Michaelmas Daisies, so everything has to be in perfect condition....really. Theoretically it does.

As a Collection Holder with over 400 Michaelmas Daisies we do have some issues due to space limitation, the garden is just an acre and a half. Most of the collection is planted within mixed borders including annuals, other herbaceous perennials,

trees, shrubs and bulbs creating a nice balance which is relatively trouble free. It's the New York Asters (*Symphyotrichum novi-belgii*) that are the problem, and it's not necessarily what you might think.

The *S. novi-belgii* collection is grown on its own in five raised beds. They are planted at the beginning of May to grow on for the coming year's display. Then, in February they are lifted to be propagated by division and rooted out into nine inch pots. These are used to replant the beds again in May and the rest are potted on for sale. And so each year the cycle continues, creating a monoculture. Now any sane gardener wouldn't practice this in their own (vegetable) garden because we all know planting the same crop, in the same piece of ground year in year out will eventually cause problems for the soil, leading to poor plant health. Well the *S. novi-belgii* is no different and can suffer from some serious problems. These problems include *Verticillium* wilt, tarsonemid mite and of course powdery mildew.

To overcome these issues in the past, various practices have included the removal of all the soil and fresh soil brought in, or the sterilisation of the soil by heat or by chemicals. Now the idea of moving a tonne of soil makes me ache all over but the thought of actually killing the soil makes me shiver all over. Soil is a fundamental part of our gardens, and we need to look after it and respect it. There can be more life in a teaspoon of soil than there are people on the earth, things like bacteria, fungi, protozoa and nematodes are all busily working away keeping our soil sweet and fresh. So we have decided to ditch the poisons and work with our soil and with nature, we want to manage and nurture it and encourage its flora and fauna. And of course avoiding any unnecessary hard work!

Verticillium wilt is a soil born bacteria always present in the soil but not a problem at low levels, it only becomes a problem when repeated planting increases it to detrimental levels, causing the plant stems to stop functioning and the whole plant to wilt. Unfortunately, once the plant has started wilting, which is usually between late August and late September just as they are coming into flower, there is nothing you can do to stop it. Shoots from infected plants may appear quite healthy but often carry the wilt-causing problems the following year in the ground or in containerised stock.

The key here is the soil, so the first thing we do when we lift the plants in February is to try and squeeze in a catch crop of Caliente mustard. This prevents the soil from remaining bare for the next 3 months, providing leaf cover and root growth helping reduce soil erosion, compaction and leaching. But the main reason for using this particular green manure is that it's a natural bio fumigant. Just before the crop starts flowering we chop it up and dig it into the soil, finally covering the area with polythene. The chopped up plant material starts to release a gas, this bio fumigant can reduce the levels of *Verticillium* wilt, at the same time the breakdown of foliage and roots increases levels of beneficial soil flora and fauna, thereby increasing competition and soil structure. We have now been doing this for the last five years, since the 'Diamond' beds were created, and have had no issues with wilt apart from accidentally re-introducing infected plants in the first two years. In these cases we discarded the plant material when it was lifted and removed the soil from that area, replacing it before sowing the green manure crop.

We also started to apply concentrated liquid seaweed, this is diluted down and regularly sprayed on the plants once they have been planted. This improves plant growth but more importantly root growth, allowing them to utilise the soil more efficiently, taking up more area in the soil, thus reducing the space left for pathogens to occupy. The contact of the diluted seaweed onto the soil will also increase beneficial flora and fauna i.e. microbes and nematodes helping increase stress tolerance of the plants, thereby increasing resistance to powdery mildew and other pest and disease attack. By encouraging the beneficial flora and fauna we are boosting the competition against soil borne pathogens - a great all round plant tonic and essential for good soil husbandry.

Other problems we have to manage are tarsonemid mite. This wee beastie crossed over from strawberries in the late 1960's and when the temperature is optimal will graze the top of the novi-belgii stems, causing flower distortion or failure. Large infestations can be devastating, ruining all the plants. In the past acaricides (insecticide specific to mites in the Arachnid group) have been used but obviously this kills more than just the mites, affecting resident populations of beetles and bees. Now we use nature itself to combat these little guys by increasing the natural population of a predatory mite called Amblyseius cucumeris. This bio-control is an ideal way to keep the tarsonemid mite to a tolerable level.

And finally powdery mildew, some cultivars of *S. novi-belgii* are more susceptible to mildew than others but as we have the National Collection on show here at the Picton Garden they all must be looking their best. In the past fungicides have been used regularly as a preventive. However, over the last couple of years we have been trying ‘SB Plant Invigorator’, an oil based product that when sprayed over a plant produces a coating on the foliage, suffocating any existing fungus and preventing new infection. Be warned though, this will affect any creatures on the plant also, suffocating them on contact. Also part of our integrated pest management is Garlic Spray; this will also work on some level as a fungicide, provided you can cover all the foliage. It can also be effective against pests, smothering eggs and larvae on the crop as well as deterring any sap suckers and herbivores. Its chemical compounds may also help reduce the susceptibility to Verticillium wilt. The SB Plant Invigorator and Garlic Spray may not be perfect for the invertebrates but they are a great leap forward in helping to reduce the use of chemical pesticides in the garden.

All of these practices are applied in union; as a standalone idea they will be less than effective, but used together they can be an effective way of managing the health of your garden as a whole. This system is known as Integrated Pest Management (IPM) a broad-based approach that integrates practices for economic control of pests. The aim of IPM is to keep pests, diseases, even weeds at a level that will not interfere with the plants we are trying to grow, using techniques and measures that cause the least disruption to the ecosystem.

‘Biochar’ is another measure we are trialling and this is one of the simplest things we have done to improve our soil health. Basically Biochar is just small pieces of charcoal added to the soil and raked in; a practice that dates back over 2000 years to improve soil structure, help reduce nutrients from leaching and retain water. It may also act as a habitat for many beneficial soil micro-organisms. In theory the

addition of Biochar to the soil should mean less nutrients and water are needed for the crop and that the flora and fauna in our soil is in peak condition, allowing our plants to grow strong and healthy and stress free. This is a fascinating subject and worthy of an article on its own, the use of Biochar in a sustainable and responsible way appears to have a beneficial effect on the wider environment, not just our own gardens. If you are interested in trying some Biochar I would recommend finding your local Charcoal maker, they usually produce it for BBQs, ask them if they have any waste for sale, usually the crumbs and dust they can't sell.

It must not be forgotten that an important factor in all of this is plant stress and any plant that is suffering from mineral deficiency, lack of food (overfeeding can also cause problems) and, in particular, drought will cause the plant to become stressed, making it much more susceptible to any pests and diseases. So making sure our plants are planted properly and in the right conditions will give them a head start.

2016 was the first year we have carried out all of the controls together, trying to find a system that will work for us to produce a healthy crop of S. novi-belgii and a great display for our visitors. It may be a little more work but it is by far, a much more pleasant task for us to perform and much more sympathetic with our immediate environment. Now the season has finished and Jack Frost has made more than one appearance we can reflect and measure how well it has gone. The *S. novi-belgii* have been just okay, they have been better in the past (using traditional methods) but it is early days. There was some mildew but we did have quite a dry spell and we should have watered a bit more, we also didn't do any mulching this year. Tarsonemid mite was not a major problem and Verticillium wilt was minimal. If anything, the plants were probably on the hungry side and didn't grow as well as normal. We reduced the fertilizer application at planting to try and grow sturdier, more robust plants; unfortunately all we got were fewer flowering stems! However, the basal shoots, this year's crop, are looking extremely healthy and numerous.

These pests and diseases all still exist in our garden, it would be foolish to try and eradicate them completely; it's more a case of trying to keep them at tolerable levels, working with them and our controls to keep a happy balance.