

Kenyan floriculture leads the way

In a decade Kenya has transformed its burgeoning flower production industry. Instead of high pesticide and fertilizer inputs many flower farms now rely on predatory insects to control pests. Louise Labuschagne of the Real IPM Company follows their journey.

The year round sun and high altitude growing regions on the Equator is a powerful magnet for investment in flower production in Kenya. But does this shift in production from Europe to Africa mean that flowers will be grown in a less environmentally safe manner - polluting world heritage site lakes, poisoning workers and strangling biodiversity?

The answer is a resounding 'no'! A decade ago, it was important for journalists and environmentalists to highlight bad practice in Kenyan flower production. Over-use of pesticides on some farms was a serious health and safety issue and localized environmental disasters commonplace. But that is old news.

During the last decade in Kenya - one of the world's most important rose production areas - there has been a significant shift in focus towards Integrated Pest Management and reduction in pesticide and even fertilizer inputs. Many of the Real IPM Company's flower farms are using vermiculture (worms) to produce foliar feeds which can reduce fertilizer inputs by up to 40%. It is now time to put the record straight, to applaud and support the achievements of the Kenyan flower industry and to channel lobby power into encouraging other countries to follow suit. It is time for growers to stop insisting that biological control can 'only be used where economically feasible', to stop allowing them to influence Milieu Programma Sierteelt (MPS), the Kenya Flower Council (KFC), Global GAP, Fair Trade and other audits to water down the compliance criteria for IPM in flower audits. It should be a 'must' to use biological controls for mites in roses and carnations to replace acaricides completely, and there should be a farm plan to implement this. Kenya now leads the world in reducing pesticide use on roses embracing biological control on a scale not foreseen in 2000.

What happened to Kenya's crop protection programmes?

Kenya benefits from having two large-scale indigenous bio-control companies, the Real IPM Company and Dudutech. Both companies mass produce natural enemies of pests which can be used instead of pesticides. The Real IPM Company is also

developing bio-pesticides which will be used to replace fungicides for the main rose diseases. Dudutech is the sister company of two large flower growing companies, Homegrown and Finlays - which contribute about 10% of the area under roses in Kenya - and the main focus of Dudutech's bug-supply is to support IPM programmes for its sister companies. As a result of the ground breaking work done by these two Kenyan companies, a huge demand for biological control agents has been generated in East Africa. The large international bio-control companies are now 'moving in' to the East African market. Koppert has formed a joint venture company 'Koppert Kenya', supplying a range of imported biological control agents and has built up a technical team to provide product support to growers. Biobest, a Belgian bio-control company is also investigating the supply of bio-controls to this market.

However, the most important development is that a major chemical company, Syngenta, has 'bought into' the IPM market and has put its weight behind an ambitious programme to bring both biological controls and judicious use of compatible pesticides to the Kenyan industry. Syngenta has long been assessing the importance of biological controls and its subsidiary, Syngenta Bioline, which mass produces a wide range of beneficials in the

UK and California, has teamed up to register biological controls such as 'Phytoline' in the Kenyan market. 'Phytoline' is *Phytoseiulus persimilis*, a predatory mite which eats spider mites. It is the trade mark of its subsidiary, Syngenta Bioline.

Talk at a recent trade show in Nairobi, on the chemical trade stands has been all about the collapsing chemical sales, particularly for acaricides (the pesticides which kill mites). Mites are the most important pest of roses and account for up to 60% of all pesticides (including fungicides) applied to the crop. No doubt pesticide distributors as well as other pesticide companies will be forced to acknowledge that in some key areas pesticides are not best. Biological controls are best. They too will need biological controls on their portfolio - because that is what growers want. That is what is worth paying for.

Skills and experience

Biological control programmes are more difficult to get right than chemical programmes. The level of management skills needed are much higher, since if the grower does not introduce enough predatory mites at once (at least one million per hectare) then there could be crop damage from continued mite feeding, until finally the predatory mite has eaten all the mites on the crop. Then the predator itself dies out as there is nothing to eat.

Training of farm staff together with experienced consultancy support is essential to reap the full benefits of biological control. Having access to good bugs is not enough - it's just the beginning of the journey. The Real IPM Company is now directly servicing 450 hectares (ha) of flower crops in Kenya (out of 3,000 ha total) with the country's leading growers - Oserian, Timafloor, Penta, Kongoni, Kisima, Uhuru, Tambuzi, Mt Elgon, Batian, Lobelia, Subati and many others who have just begun. At least one flower market label on



Penta Flowers, neighbours to Real IPM have been trained by Real IPM in vermi-liquid production and now have the largest natural liquid fertilizer unit in Kenya - worms are fed on waste rose debris from the prunings and packhouse rejects

Photo: Louise Labuschagne



Real IPM consultant Anthony Kimotho is based full time at Oserian Farms to provide the technical support needed to the farm technical team
Photo: Louise Labuschagne

the Dutch auction is now insisting that its suppliers use Real IPM programmes due to improved flower quality. The un-packer will actually pay for the IPM programme upfront and deduct the cost from the payment to the grower for the flowers sent to auction.

Good biological control will leave a completely clean crop. Because there are no mites left to feed on the crop, the growers benefit from up to 20% more flowers, have up to 5 cm more stem length and have first class foliage and larger heads. There is no longer an economic excuse not to use biological control for mites in roses or carnations. Oserian, the largest flower company in Kenya, with 200 hectares of roses and carnations is more than half way through cleaning up its farm and implementing biological control on its crops. In an energetic joint programme with Real IPM, which has involved an intensive management training initiative, they have proved that it can be done economically and practically. Oserian and Real IPM aim to have the entire farm under biological control before the middle of 2009. This will be the largest single rose farm using biological control for mites in the world. And it is a Kenyan farm – right by Lake Naivasha. So let's hear more about the good things which are happening around Lake Naivasha and stop regurgitating old news that has no foundation in fact.

However, not all bio-control programmes for mites use the same large introductions as the Real IPM programme. Programmes which use lower numbers of *Phytoseiulus*, still need the support of 'compatible' pesticides to prevent the flowers from being damaged – as these programmes take much longer to get rid of spider mites completely. It is a simple

numbers game – the more mites in the crop, the more *Phytoseiulus* is needed. And a biological control clean-up programme may not be the best option if the total number of mites exceeds 20 million per hectare. Crop damage will definitely occur if mite levels are too high at the outset. A compatible spray will be needed to bring down the level of mites before the bio-control programme starts. Most growers need experienced advisors for at least the first 12 months to support the farm managers in the design and implementation of a compatible spray programme to allow the farm to clean up all its greenhouses as quickly as possible.

It is also important to have a plentiful supply of predatory mites once the farm decides to 'go biological' – as clean greenhouses can get re-infected with mites from old houses full of mites. The mites travel around the farm on wind currents and on staff clothing. Some farms in Kenya which have been trying to grow their own *Phytoseiulus* have an erratic supply of or sometimes no supply of predators – crops suffer when this happens. As a result these farms have not been able to clean up their whole farm – many have only had two or three hectares under IPM for at least four years. Progress has been slow due to supply of *Phytoseiulus* rather than commitment. This will all change in 2009. The Real IPM Company is expanding production to meet export demands as well as East African demands. The management strains of needing your own bug production unit on your farm are over. Rose growers can get on with growing roses and leave the rest to others.

The need for technical support

With an estimated 3,000 ha of flowers in Kenya and another 1,000 ha in Ethiopia there is plenty of space for all these IPM companies. There is not a lot of difference in the quality of the predatory mites and most of the real value of the product is in the support to growers provided by the suppliers and the design of the IPM programme. Novice growers need experienced technical advisors to guide them carefully through the biological control mine-field. Biological controls can damage crops if not used well. It is not uncommon for new growers to kill predatory mites with non-compatible sprays soon after releasing them into the crop. Downy mildew and other pests and diseases still need to be controlled. Which pesticides should be used – where should they be used – and when?

The design of the IPM programme can vary enormously – there is more than one way to 'do' IPM. A bio-control programme which uses very large numbers of predatory mites in a single application (at least one million *Phytoseiulus*) will eliminate all the mites within eight weeks – after which time the grower also has no *Phytoseiulus* (all die as there are no mites left to eat) – therefore non-compatible sprays can be used for whitefly, mealybug or disease if needed. If the bio-control programme uses only a few

Phytoseiulus – it will take longer to get the crop clean – and a longer time before the grower can use certain chemicals. The longer a bio-control programme takes to clean up mites, the higher the risk of damage from mite feeding, and the need to apply some acaricides as well as *Phytoseiulus* to prevent damage to flowers.

The other hurdle which most growers fall at – is scouting for hotspots. Scouts are often poorly supervised and failure to find, mark and treat hotspots will lead to crop damage. The management time spent in supervising this simple activity will pay huge dividends. Often it is the visiting advisor who notices when these jobs are not being done well.

The future

The economic advantages of investment in Kenya, Ethiopia, Ecuador and Columbia are clear. There is unlimited labour willing to work in flower farms and labour costs are about 10% of the equivalent labour in Northern Europe. Flower production in the cold Northern hemisphere in winter, early spring and autumn cannot be achieved without high fuel bills for both heating and lighting.

Flying into Netherland's Schipol airport in the winter is an extraordinary sight – vast areas of orange sodium lights emitting 10,000 to 14,000 lux, force the plants to grow in an unnatural season. So much heat is produced from these lamps that breeders are having to come up with new varieties which will grow in Northern Europe under this artificial heat.

The 'carbon footprint arguments', which for some years were used to criticize the production of flowers and vegetables on the Equator for export to Europe, pale into insignificance compared to the energy bills for the year round production of flowers in Northern Europe. As a consequence, the area of roses grown in Holland has fallen from 1,000 ha in 2000 to 600 ha in 2006 with an estimated further fall of 200 ha in the past two years. Over the same period, the area of flower production in East Africa has risen to a staggering 5,000 ha by some estimates.

The carbon footprint and high costs of flower production in the historical epicentres of floriculture technology such as the Netherlands are having an impact on the continued viability of production in Europe. Kenya has demonstrated its ability to lead the world in floriculture crop protection programmes and will continue to demonstrate through its compliance with global audits that it has the integrity and energy needed to continue ahead of the pack. How far have the growers in other countries gone on this journey? Not very far? The audits should distinguish the progress made by leaders in the field.

Louise Labuschagne, Technical Director, The Real IPM Company (Kenya) Ltd, labuschagne@realipm.com, www.realipm.com