**Symposium Report: 1st International Whitefly Symposium, Kolymbari, Crete**

**20-25th May 2013.**

The First International Whitefly Symposium took place in Crete between the 20th and 25th May 2013. This symposium combines the former ‘European Whitefly Symposium’ and the ‘International *Bemisia* workshop’ into the one meeting. This is much better organising now as the previous two meetings were simply duplicating each other.

The symposium covered all aspects of *Bemisia* research, ranging from biology, genetics, whitefly symbionts, transmitted viruses, chemical control/resistance and biocontrol/IPM.

The UK still remains in its unique position in regards to *Bemisia tabaci* research in that we do not currently have this whitefly established either on outside crops or within the glasshouse environment. The UK still maintains its ‘Protected Zone’ status. At the symposium I presented our current research findings/published work (Cuthbertson *et al*., 2012) and also gave an update on the current status of *Bemisia* in regards to the UK (Cuthbertson, 2013). The work was very well received. We are in many ways the envy of the world when it comes to *Bemisia*, simply because we are continuing to prevent its establishment within our horticultural industry. We are seen as leading in the world in regards to eradication of *Bemisia*. Many international researchers at the meeting were envious of our position and very intrigued by our excellent working system involving our PHSI, policy/consultants and research scientists working together to keep *Bemisia* at bay. This was an excellent piece of publicity for Fera and our related work to a worldwide whitefly specific audience.

A major part of the symposium was the discussion of the *Bemisia* species complex. It is now thought that there is probably >30 cryptic species of *Bemisia*. It is now fully accepted that *B. tabaci* is indeed made of up morphologically indistinguishable species (much work from China was presented outlining unsuccessful cross-mating of several biotypes) which can only be identified via molecular means. Presented work from Australian and New Zealand workers showed strong evidence of at least 30 different species. The names of the different ‘species’ are still not universally accepted and so are often still referred to as Biotype ‘A’, ‘B’ or ‘Q’ etc. It was stated that there are currently 3 global species of *Bemisia*: B, Q1 and Q2. The tobacco and poinsettia trade are classed as the two big players in the global spread of *Bemisia*. Many countries have their own indigenous Biotype of *Bemisia*, for example, Sicily has the T biotype which is found more frequently in higher altitudes. China was stated to have 15 cryptic species of *Bemisia* present. We in the UK have in the past year confirmed that we are regularly intercepting Biotypes B and Q (Powell *et al.,* 2012) entering the country on plant produce (we have yet to determine if they are Q1 or Q2). We also currently have specimens awaiting sequencing that have proved to be neither B nor Q biotype. The significance of the different biotypes is that it is very important in regards to continuing the development of control strategies to eradicate the pest. The Q biotype is well known for its increasing resistance to neonictinoids (as work presented from the USA outlined). The eradication strategies that we at Fera have developed, aimed at overcoming resistance (Cuthbertson *et al*., 2012) were very well received and much discussion focused on these following my presentation. Work presented also outlined that the B and Q biotypes do not mate together. When B and Q are together the female Q progeny is reduced. When biotype B makes up 25% of the population it displaces the Q. However when B is only 10% of the population, displacement can go either way. It was widely stated that insecticide use causes the Q to displace the B biotype. In the UK we have seen a shift from B to Q biotype entering on plant produce (Powell *et al*., 2012) over the last number of years. It is thought the B biotype has its origins in the Middle East/North East Africa and the Q biotype has Mediterranean origins.

The section dealing with biocontrol and chemical resistance had presentations outlining the continued build-up of resistance within *B. tabaci* to neonicotinoids and in particular imidacloprid. Chemical control of *B. tabaci* has relied on a dynamic suite of insecticides that for some years has included a range of neonicotinoids and pymetrozine. Resistance patterns in *B. tabaci* are complex, and sometimes cross-resistance between chemical classes renders it difficult to implement resistance management strategies based on different modes of action. Several presentations, (including my own Fera work), demonstrated that soil treatments of neonicotinoids (imidacloprid) taken-up systemically by crop plants provided longer term residual activity that was effective in reducing populations of *B. tabaci*. It was stated that proliferation of other neonicotinoids, often in the same crops in which imidacloprid is used, has increased selection pressure for detoxification and/or target site-insensitive mechanisms of resistance to this group of insecticides. A presentation by DuPontTM outlined the product, CyazypyrTM. This insecticide has a novel mode of action in that it selectively activates the ryanodine receptor in insect muscles. It is the first compound in its class of chemistry that has high potency against selected Hemipteran pests, including whiteflies. It can also offer excellent control of a broad spectrum of Lepidopteran pest species including thrips, aphids and leafhoppers. Laboratory and field studies have shown excellent control of whiteflies. We at Fera have recently undertaken some initial screening trials using this product which has to date proved very efficient.

Much work presented (including my own) also outlined the role entomopathogenic biocontrol agents (nematodes and fungi) have in controlling *Bemisia*. Research also proved how parasitoids were able to distinguish between different biotypes of *Bemisia* and hence their infection rates varied much depending on what biotype was present.

Due to the efforts to prevent the establishment of *Bemisia* within the UK our tomato industry remains free from several *Bemisia* transmitted viruses, for example, Tomato Yellow Leaf Curl Virus (TYLCV). Work presented outlined how *Bemisia* development can be faster on TYLCV infected plants than on non-infected plants. They have longer adult longevity, higher fecundity and therefore more rapid population increase. Both B and Q biotypes transmit TYLCV. Other hosts for the virus include pepper and petunia.

Attending these meetings is always a great ‘eye opener’ and brings home the very fortunate position we in the UK are in with respect to *Bemisia*. Much effort, time and resources are being channelled against this global pest around the world trying to control it. We in the UK should re-double our efforts to ensure that *Bemisia* does not become established within our horticultural industry, simply because, the best way to control an invasive pest is to prevent it becoming established in the first place.

Many requests for reprints of our Fera published work have been received from many interested researchers, several of whom are planning to attend the ‘European Congress of Entomology’ next year in York and who also would be interested in including a visit to Fera should they be able to attend the meeting.

I have the book of abstracts from the symposium should anyone wish to view it (our Fera work is on page 117). Should anyone wish to receive copies of the published articles cited within this report (listed below) please just get in contact:

Cuthbertson, A.G.S. (2013). Update on the status of *Bemisia tabaci* in the UK and the use of entomopathogenic fungi within eradication programmes. *Insects*, **4:** 198-205.

Cuthbertson, A.G.S., Buxton, J.H., Blackburn, L.F., Mathers, J.J., Robinson, K., Powell, M.E., Fleming, D.A. & Bell, H.A. (2012). Eradicating *Bemisia tabaci* Q on poinsettia plants in the UK. *Crop Protection*, **42:** 42-48.

Powell, M.E., Cuthbertson, A.G.S., Boonham, N., Morris, J., Bell, H.A. & Northing, P. (2012). First record of the Q Biotype of the sweetpotato whitefly, *Bemisia tabaci*, intercepted in the UK. *European Journal of Plant Pathology*, **133:** 797-801.

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Dr Andrew G S Cuthbertson

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