



## NEWSLETTER 2013-14

### Flavour is now the main objective

How things change! A decade ago, increased alpha-acid content was still the main objective for the breeding programme with just occasional crosses for flavour. However, from its inception in 2007, Wye Hops Ltd has had increased emphasis on flavour as one of its stated primary objectives. Such crosses have been the major part of the work since 2010. As a result, almost all the seedlings in the current breeding garden are there to be selected for their flavour, not their alpha. The IBD has awarded Wye Hops a grant for the next two years to help make and assess these selections.

### ... but wilt resistance still a priority

Wilt disease remains a potential problem on many farms. Therefore, resistance to this disease in new varieties also remains an important objective for the British hop breeding programme. Results were obtained from wilt tests carried out in Slovenia during 2013 on twenty new selections (see picture). Eight were identified as resistant with five showing strong resistance similar to reference variety 'Wye Target'.



### Aroma assessments key to new selections

Dried cone samples of selected seedlings and plots were assessed by a trade panel of merchants and brewers in January 2014. Several were considered of particular note with some seedlings of 'Bramling Cross' and 'Keyworths' giving very intense floral or fruity aroma. The opinions of the panel were one of the main factors taken into account in selecting for further trials.

### BHA take collection on to farms

The BHA has completed a re-appraisal of the aroma of accessions in the germplasm collection at Wye Hops, including the National Hop Collection. Over the last three years, selections have been assessed to see if any of the aromas of these historic hops are likely to excite the modern brewer or drinker. Several were found which might! Cuttings were taken from five such accessions in spring 2014 for planting on farms.

### Interest in British hops

Increased interest in hop flavour continues in the brewing industry and amongst beer-drinkers. Publicising the work done by Wye Hops for the British hop industry through talks, presentations, visits, tours of the trial plots, reports and press interviews is an important and varied part of the work. During the last year, there were over thirty different such technology-transfer events including collaboration with the BHA for a presentation on British Hops made by Alison Capper to the IBD Asia-Pacific Section conference held in Ho Chi Min City, Vietnam. Visit [www.britishhops.org.uk](http://www.britishhops.org.uk) to see the slides for the presentation.

*If you have any comments, questions or would like more detailed information about the articles in this newsletter, please contact Peter Darby or the Directors of Wye Hops Ltd - Clive Edmed, Andrew Hoad, Simon Parker, Bobby Neame, and Tony Redsell.*

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### Archives yield more information

Records of wilt resistance tests kept in paper files in the Wye Hops office go as far back as 1955. Salmon's last variety, OZ97a, was in production on farms in 1957 as a new wilt tolerant selection but detail of its performance in wilt tests pre-dates the paper files. A visit to the archives of the Wye College Hop Research Department, now held at Imperial College, Hammersmith Campus, revealed that it had been tested in 1953. It was found to have good resistance to wilt such that it was planted on farms in 1955 on land specifically where 'Fuggle' had been grubbed due to wilt. With the renewed interest in this variety, this detailed information will be very helpful.

### Top of the Hops 2014

Exactly 2,014 female seedlings from the breeding garden at Wye Hops Ltd were harvested, dried and baled commercially to provide for a promotional beer brewed by the Great Yorkshire Brewery, Cropton. It was distributed on draught through the M&B pub chain as Top of the Hops golden ale, claiming to contain a world record for the number of different hops used in a beer. Reaction to the taste of the beer has been very favourable.

### Powdery segregation supports theory

At the IHGC Scientific Commission meeting in Kiev in 2013, Peter Darby presented a paper speculating on the discovery of a gene present in 'Sovereign' which could upset the expected Mendelian segregation ratios for the inheritance of resistance to powdery mildew disease in glasshouse tests. Understanding the effect of this gene allows greater discrimination in selecting for resistance and may explain why 'Sovereign' shows much resistance in the field. As well as in Britain, hop breeders in Germany, Slovenia and the USA have reported some progenies not conforming to the expected patterns. In the Wye Hops glasshouse powdery mildew disease screen of new seedlings in early 2014 (see picture), there were nine families in which this 'Sovereign' gene could have been present. In all nine families, the observed ratios of susceptible to resistant types deviated from conventional expectation from the known R-genes in hops but conformed to the theory proposed in Kiev. Just coincidence, or perhaps this is something real?

### Dwarf link to selinene broken

Most dwarf hop varieties have a high selinene content in their essential oils because the gene for dwarfness is closely associated with the gene for high selinene production. 'Boadicea' is the exception showing that this linkage between traits can be broken. New seedlings from crosses specifically designed to break the linkage were assessed in 2013 and thirteen dwarf plants were identified. Analysis of their oils revealed low selinene content in all but four plants. This successful trial has provided many new dwarf parents to take the programme forward in which the linkage between dwarf and selinene has been broken.

### Black bean aphids on hops?

Resistance to hop aphid is one of the objectives of the breeding programme at Wye Hops and has produced 'Boadicea' - the world's first, and so far only, variety with natural resistance. Each year, further crosses have been made to develop varieties with such resistance. Several new selections from this programme have now reached advanced trials. In early July each year, new progenies in unsprayed plots have been assessed for their infestation by hop aphids. Over the last few years, occasional black bean aphids have also been noticed on the hop seedlings. Conditions in 2014 clearly favoured the black bean aphid on hops and several colonies were found with the aphids producing offspring. Intriguingly, of the several hundred plants individually assessed, the black bean aphid was never present with the hop aphid and its colonies were only on plants resistant to the hop aphid.