THE HEALTH STATUS OF STOCKS OF THE NEW HOP VARIETY WYE TARGET

J. M. THRESH and P. J. ORMEROD

Introduction

The new wilt-tolerant variety Wye Target is potentially of very great importance to growers in the south-east. If the advantages of this variety over other wilt-tolerants are to be fully exploited, it is essential to plant stocks that are as healthy as possible and to avoid infection with virus diseases and wilt. Stocks of widely differing health status are in circulation already and growers should be aware of the resulting hazards and difficulties that arise.

EAST ANGLIAN STOCKS

The best available clone of Wye Target is the one released to 'A plus' propagators in East Anglia. It was carefully selected at Wye College for freedom from arabis mosaic virus and prunus necrotic ringspot virus (NRSV). However, the clone was not isolated before it had become infected with hop latent and hop mosaic viruses which are aphid-borne and present in all established mosaic-tolerant varieties.

Wye Target has not yet been accepted as eligible for certification within the 'A plus' scheme of the Ministry of Agriculture,* but it may be grown and inspected within the 'Group 3' category. This comprises the various wilt-tolerant, mosaic-tolerant varieties including WGV and Bramling Cross (OT 48). However, Wye Target differs from these varieties in its freedom from NRSV and should be grown at least 50 and, if possible, 100 yd away from them, to decrease the risk of infection by this virus.

The first stocks of Wye Target were sent to East Anglia in the spring of 1972 and the first plants were sold in the winter of 1973–4. Inevitably supplies were inadequate to meet the expected demand and the Hops Marketing Board arranged the initial distribution.

As many growers as possible were supplied with 500 plants each during the 1973–4 winter. This will permit the establishment of a small planting and provide a nucleus of sound material for those growers wishing to propagate in 1974. To decrease the risk of infection with NRSV these plants should not be mixed with other material of Wye Target and they should be grown away from all other established varieties, except Wye Northdown and Wye Challenger (which were also free initially from NRSV). Additional precautions are necessary to prevent infection with wilt and soil-borne viruses. Propagation sites should not have been used previously for hop growing and the soil should preferably be free from the dagger nematode (*Xiphinema diversicaudatum*) which is the vector of the arabis mosaic/nettlehead virus complex.

PROPAGATION IN THE SOUTH-EAST ORGANIZED BY HOPS MARKETING BOARD

To expedite the original introduction and commercial assessment of Wye Target, the Hops Marketing Board initiated a 'crash' programme early in 1972. Selected growers in Kent and Sussex were provided with basic stocks from Wye College. These stocks were multiplied rapidly by mist propagation to provide numerous rooted cuttings that were grown-on in pots of sterile compost or planted out in the field. The nursery sites were carefully selected for their freedom from *Xiphinema* and they had not previously been used for hop-growing.

The first available cuttings were released by the propagators in the early summer of 1972 and used to establish farm trials at selected wilt sites to assess the reaction to this disease. Further issues were made during the winter of 1972–3, when many growers were selected by ballot and provided with 1000 plants each.

The basic stocks released from Wye College for propagation under the conditions of Hops Marketing Board were raised from field-grown plants. It is now clear that NRSV must have been present in many of the original source plants in addition to mosaic and hop latent viruses. Recent tests have shown that at least two-thirds of the material now contains

* Wye Target has since been accepted for certification in 1974.

NRSV. The situation is similar at each of the propagation sites and in gardens established with this material.

The precise effects of NRSV on the yield and alpha-acid production of Wye Target are not known, but infection decreases the productivity of the three other varieties tested. This suggests that the material of Wye Target raised in Kent and Sussex is inferior to that being raised in East Anglia. The situation can, however, be improved by the use of NRSV-free source plants for all future propagation in the south-east. This has been recognized by Hops Marketing Board and the original propagators were provided with fresh NRSV-free parent plants from East Anglia in the autumn of 1973.

OTHER PROPAGATION IN THE SOUTH-EAST

Many growers have now received Wye Target plants provided in 1972 or 1973 by the five original propagators in Kent and Sussex. Inevitably there will be further indiscriminate and uncontrolled propagation. There is a serious risk of further spread of NRSV and of exposure to progressive Verticillium wilt and nematode-borne viruses. Growers who plant this suspect material should do so only as a temporary expedient that should be abandoned as soon as alternative stocks are available. Under no circumstances should locally grown plants be used to plant fresh sites where hops have not been grown previously.

MERISTEM-TIP CLONES

Several clones of Wye Target have been raised from meristem-tips by Dr A. N. Adams at East Malling Research Station. They have been freed from all known viruses by a combination of heat-therapy and meristem-tip culture. However, it is not yet established whether they are true to type and superior to the clones already released from Wye College. If one of these clones proves to be better than existing ones it will be released for propagation at isolated sites outside the hop-growing areas. The clone will then be eligible for certification, preferably under a new and improved scheme designed to preserve and indicate the superior health status of this and other virus-free clones.

There will be a delay of at least 2 years before detailed evidence on the performance of the clones is available from yield trials. Meanwhile details of a new certification scheme are being worked out.

Summary and recommendations

Growers wishing to plant the new wilt-tolerant hop variety Wye Target should be aware of the widely differing health status of the various stocks now available. The clone released to propagators in East Anglia was initially free from prunus necrotic ringspot virus. In this respect it is superior to the partially infected clone released to growers in Kent and Sussex for extensive mist propagation on behalf of the Hops Marketing Board. Stocks raised by indiscriminate and uncontrolled propagation in the hop growing areas will be even less satisfactory. It is inevitable that some will have been exposed to infection with progressive Verticillium wilt and the arabis mosaic-nettlehead complex of viruses transmitted by *Xiphinema*.

Growers should use East Anglian material for all new plantings as soon as sufficient stocks are available. Any further propagation should be from parent plants bought in from East Anglia. These should be grown as far away as possible from other hop varieties at sites where there is little risk of infection with wilt and nematode-borne viruses.