

Increasing basal shoot production

By Chris Burgess, HRI Efford

This project aimed to improve quality in field grown bush roses by examining the cultural practices of tipping back and topping, and by looking at the effect of plant growth regulators (PGR) on basal breaking. It was shown that:

- Tipping back and topping are of limited or no benefit, so growers could make savings in labour costs by not carrying out these treatments.
- Using Ethrel C (synthetic PGR) can increase basal breaks on 'shy' breaking cultivars by as much as 60%.



Margaret Merrill - untreated



Margaret Merrill treated with Ethrel C

Tipping back and topping out

'Tipping back' is a common practice to help reduce wind damage ('blow out') to young bushes while the bud union is still developing, and because it is believed to enhance basal shoot development and final quality of shy breaking cultivars.

Some growers 'top' bushes with a mechanical trimmer, at a height of

about 35-45 cm from the ground, depending on cultivar vigour. This is done in early summer before blow out damage becomes too serious with the aim of reducing the 'top heavy' portion of the shoot coming into flower. Improved basal shoot production has been reported by some growers, although further branching from the cut tops can occur.

Tipping back and topping practices vary widely within the industry and this project examined a representative

range of typical treatments to determine the effectiveness of these practices. The experiments took place at frost free HRI Efford, Hampshire.

Treatments

Rosa Laxa rootstocks were budded with the shy breaking cultivars Margaret Merrill and Silver Wedding and the vigorous 'freely' breaking Remember Me, and the following treatments undertaken:

| Treatments | Description | Treatment timings |
|-----------------------------------|---|--|
| Primary shoots pruned at nominal: | 6 cm length down to 1 cm 15 cm length to 1 cm 15 cm length to 4cm 20 cm length down to 1 cm 30 cm length to 1cm 30 cm length to 4 cm | 22 April & 27 April 6 May 6 May 9 May 13 May 13 May |
| Untreated | plants with primary shoots selected at 6, 15, 20 and 30 cm stage left unpruned | |
| Treated | shoot tops of first grown flush cut back to approx 35 cm height from ground at early inflorescence development (mid May - early June) | 17 May |
| Late topping | plants cut back to approx 35 cm height from ground late flowering after most budwood would have been collected (mid July) | 17 July |

A proportion of plants prematurely 'shot bud' in the summer and autumn of the budding year, these were not selected for the main experiments, but were monitored separately.

Results

Tipping back

- Tipping back increased final shoot numbers by as much as 20% but not consistently. Often any increase was at the expense of the shoot diameter.
- Tipping back to a 4 cm stub was no better than hard tipping back.
- Tipping back reduced blow out damage but this was not consistent and did not eliminate the problem.
- Later tipping back (early-mid May compared with late April) was more effective than earlier treatments as some later-produced shoots on early tipped plants still suffered blow out.
- Both tipping back treatments in April and topping in May reduced the availability of budwood for propagation.

Topping

- Topping treatments were not effective at reducing blow out or improving final plant quality.

Shot bud

- Shot bud plants produced marginally more basal shoots than non-shot bud plants, but appeared to be as susceptible to blow out.

Action points

- Do not practice tipping back or topping with the primary aim of improving basal shoot production. Labour costs for tipping back range from 0.3-1.0 p per rootstock therefore a saving of £1,000-£3,000 could be made on a production unit of 300,000 plants.
- Carefully timed tipping back (at about 15 cm shoot growth stage) may reduce blow out damage, but possibly at the expense of thick basal shoot production.
- Tipping back, if done, should be targeted at blow out susceptible cultivars that are shy to produce basal breaks.
- Consider providing artificial or living windbreaks, if economic, and siting susceptible cultivars close to them to reduce blow out.

Growth regulators

The project also investigated physiological processes involved in basal shoot development, and the roles and effects of naturally occurring and synthetic plant growth regulators (PGRs) as a first step to identifying ways to increase basal shoots.

As part of this, field trials were carried out on the above three cultivars with BAP (a synthetic cytokinin) and another PGR, ethephon (Ethrel C, Certis Ltd) which was developed for glasshouse roses. Results with BAP were inconclusive, possibly due to

poor conditions in the field, but those with Ethrel C were much more promising.

In the shy breaking cultivar, Margaret Merrill, final basal shoot numbers were increased by 60% from an average of 2.9 to 4.5 per plant.

At a cost of less than 4 p/per plant Ethrel C is more expensive than tipping back, but is a more effective and reliable method of improving grade-out. At a farm-gate value of eg £1.30 per plant (Class 1 wholesale bare-root) a 10% increase in Class 1 plants would increase revenue from £780 to £910 (£130 increase) per 1,000 rootstocks. Against an extra cost of materials (Ethrel C) of £40, a net gain of £90/1,000 plants would be achieved.

Action points

- Try Ethrel C on shy to break cultivars but remember:
 - This off-label use is at grower's risk. Do not exceed the label concentration of 10 mls product/litre, and add a wetter.
 - Ethrel C will scorch soft tissue and cause sprayed leaves to drop. It must be used as a directed spray to the lower 20 cm of mature shoots at the end of the first growth flush but before significant growth from the second flush of basal shoots. This was late June at Efford in 2001.
 - Best results are achieved at temperatures above 10°C. Do not spray drought stressed plants.