Grafting and hybridization of grapevines

Many perennial crops, which are crops that live for multiple years, are improved through grafting and hybridization. A single plant, such as a grapevine, becomes a composite of different grapevines that have been fused through grafting and cross-fertilized through hybridization. This enhances crops and makes them more suitable for local growing conditions.

Grafting

Grafting is an ancient horticultural technique that surgically joins the stem, leaves, and flowers of one plant (the scion) to the lower stem and roots of another (the rootstock).

Hybridization

A hybrid is the result of hybridizing or cross-pollinating two different grapevine species or grapevine varieties. Hybridization of different species is used to generate both scions and rootstocks.

Grafted grapevine structure

1. A tool cuts the stem into the desired shape for joining.
2. This cutting process is completed for the scion and rootstock.
3. The cuts match perfectly and are tied together to fuse.
4. When the roots germinate, the grafted plant can be planted.

Hybridization

Hybridization of different species is used to generate both scions and rootstocks.

1. Some hybrids are developed to improve the scion by looking for traits like better fruit, aromatic quality, or frost tolerance.
2. Wild European grapevines are crossed with North American species to create hybrid scions like 'Chambourcin', 'Norton', 'Chardonel', and 'Vignoles'.
3. Hybrid rootstocks are generated by crossing wild species with tolerance to drought, disease, and soil types.
4. At least three native North American grapevine species are used in hybrid rootstocks.

Cross-fertilization

The product of cross-fertilization is a hybrid plant that carries the genetic material of both of the parents. In many plants including most grapevines, cross-fertilization can happen between different species.