

Workshop Title: An Overview of Grafting for Vegetable Crops

Speaker & their title: Andrew Mefferd, Johnny's Selected Seeds / Growing For Market

Executive Summary:

Grafting is well established in commercial greenhouse tomato production, and becoming more common on small farms. This presentation describes the benefits, for tomatoes primarily as well as eggplants, cucumbers, peppers and other crops. An overview of best practices for grafting is provided.

Detailed Notes

Andrew feels that grafting is an important tool for small growers so they can improve their productivity and revenue. Grafting has the potential to overcome many production problems. It has been used with woody-stemmed plants, mainly trees, for centuries. It even occurs in nature in certain circumstances. Originally grafting was developed to overcome soil borne diseases.

Grafting can result in healthier plants and higher yields because of increased resistance to disease and abiotic stress, better vigour and a bigger root system. Part of the reason for grafting' success is the resulting larger roots systems.

At this point grafting is not seen as important for crops other than tomatoes. There is experience of grafting peppers and eggplants; however, rootstocks do not provide as much of an advantage as other crops at this time. Grafting is more widely used in Europe because of greater pressure on the land base. As rootstocks are developed for other crops grafting will become more wide spread.

Why does grafting work? It is partially a plant-breeding trick. It separates the goals of the top part of the plant (scion) from those of the rootstock. The grafter can select for characteristics of either. Each part of the plant retains its own characteristics. Traits of the rootstock do not transfer to the top of the plant; rootstocks are considered the mules of the vegetable world. Most rootstocks take advantage of interspecific hybrid vigour.

There are some potential drawbacks to grafting:

- Increased cost
- Increased cost of labour
- Potential of bad grafts
- Can make plants too vigorous.
- Diminished returns, although Andrew has never done a trial that didn't increase yields. He feels that grafting is especially usefully in conditions that are less than ideal. A state of the art facility will not see as much of an increase in productivity as one that has growing conditions that are more of a challenge for the plants.
- No yield boost? Andrew would like to hear about anyone's experience that resulted in smaller yields, as this has not been his experience. Andrew has also had great experience with grafted plants in the field.

A brief description of the grafting process was discussed (four stages)

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- Propagation
- Cut and splice them
- Healing, placing the grafted plant in a healing environment or chamber is essential. This stage requires time for the plant to heal and recover.
- Re-acclimation, again time is required for the grafted plant to adjust to its growing environment.

Take an old-fashioned double razor blade still wrapped in paper and snap it in half. Use this to sever the top of the (rootstock) plant at 60-70 degree angle. Cut your top variety at the same angle and place a grafting clip on the joint of the two pieces. The top and bottom sizes must be similar for good success.

Cleft grafting is another type. On the bottom rootstock make a groove that the top plant will then fit into. Clamp these two pieces together.

One cotyledon method. Two plants are grafted together and then one plant is removed after the graft is mature.

Q. What about determinant varieties.

A. You will get good results with determinant varieties as well.

Q. Which is more important, the cut or the healing chamber?

A. The healing chamber, without a doubt, is the most important element in successful grafting. Andrew recommends practicing on old seeds or seeds you know you won't use.

Q. A healing chamber can be made with a high dome on standard 10x20 trays. Moisture can then be pumped or sprayed in to the tray.

Q. How long does it take for the graft to set?

A. Usually it takes about a week. Andrew puts the grafts in a dark place for a few days and keeps the temperature at about 28 degrees and provides very high humidity. After about five days let a bit of air into the dome and examine the results. The process is slow and gradual. If plants begin to wilt, close the plants up and provide more humidity.