

2015 ACORN Conference & Trade Show Delta Prince Edward Hotel, Charlottetown, PE

Workshop Title: Protected Culture: Managing Tomatoes and Peppers in Unheated Tunnels

Speaker(s) and their titles: Andrew Mefferd, Editor, Growing for Market Magazine

Executive Summary:

Andrew details his method of growing tomatoes and peppers in unheated tunnels. His emphasis is on carefully managing fertility inputs, good irrigation practices, developing strong transplants and being aware of fluctuating temperatures.

Detailed notes:

Bio:

For the past 7 years Andrew has worked for Johnny's Select seeds, running trials of protected culture vegetable varieties. He and his wife have a farm in central Maine where they grow certified organic seedlings, vegetables and a few pigs and chickens. He learned the art of business farming by apprenticing on organic farms in six different states.

Two of the primary crops that Andrew has been growing are tomatoes and peppers. His climate is about hardiness zone 4a-4b. He uses unheated tunnels with quite a lot of success.

Timing

It is recommended that planting should be timed according to the weather trends for the area. A common mistake is to plant too early during a warm spell to try and get a jump on the season, however, if temperatures drop again plants are vulnerable to freezing, even with a double layer of poly. Even if the plants don't freeze, in temperatures that are too low the plants won't grow or grow very slowly potentially allowing pathogens, which aren't as sensitive, to get a head start on the plants.

Andrew usually plants into the greenhouse in the third week in May. This may seem late to many people as planting time for tomatoes in the field is early June but he says growth is much slower in the field in those early days. Tomatoes and Peppers want to be between 15-30 degrees.

Varieties:

Andrew recommends growing bush varieties of peppers similar to in the field rather than tomato style vining greenhouse variety.

Tomatoes grow faster and are more resilient so are better in trellised growth where up to 9ft of growth can be expected. Try greenhouse varieties for tomatoes as they might have disease resistant properties, such as to leaf mold, which is common in greenhouse culture.

Propagation:

Andrew has learned from troubleshooting customer problems at Johnny's that one of the biggest problems for propagating tomatoes and peppers is low or fluctuating temperatures. Use a germinator with a heat mat at 28 Degrees. Also, potentially try grafting.

Fertility:

Slide shows "bullish" tomato plant, which is overly vegetative, and has curling leaves. This is a result of over fertilization. Andrew recommends taking the time to calculate the plants' fertility needs, starting with a greenhouse soil test. He also recommends not front-loading the fertility treatment, instead break it up into a couple of applications and consider fertigating (drip nutrients on plants using irrigation).

Spacing:

Slide shows peat pot put inside larger 1L pot. To get a jump on the season, try growing a bigger transplant. They will need to be potted up into larger containers as they grow. Plants will need basic support at a certain point.

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Tighter spacing is recommended inside the greenhouse. Plants in double rows 3 vines per square meter with about a meter between each double row. For bush pepper's it's more like 1 ½ plants per square meter, but could still be double row. A lot of it comes down to personal preference, some people like more space for ease of pruning and harvesting, other don't mind having a tangle of foliage. Customize spacing to your needs.

Pollination:

For smaller tunnels pollination isn't too much of a concern. Native bees come in the sides and pollinate quite readily. For a larger greenhouse it might be a good idea to put in some bumblebees.

Trellising:

Tie twine to overhead wires or pipes. Put up 2 wires 2/3rds of meter apart with 1 m walkway. This setup can be standardized for other crops such as cucumbers. String is clipped to the base of the plant and is twisted around the wire as it grows. Be sure when twisting to always go in the same direction around the string. Alternatively, tomato clips could be used.

Pruning:

For tomatoes, choose your leaders (usually 2) and take off suckers. The second leader should be developed from the sucker below the first flower cluster.

Bush peppers don't need much pruning but if doing vining peppers, peppers branch only at the point of first flower. Every node will double thereafter. Leave "flag leaf" to protect fruit.

Watering:

Andrew finds using two rows of drip works well with raised beds for even moisture distribution; one on either side of the plants. Break up watering into chunks; for example instead of 1 hour of watering per day, four 15 min sessions are better. Use watering timers. Don't water at night because the plant isn't actively taking up water. Excess water can lead to cracked tomatoes.

Harvest and Storage:

Harvest fruit when they show a bit of green shoulder (when they are about halfway ripe). Tomatoes should still reach full flavor even at this stage. In the later stages of ripening the tomato isn't getting that much support from the plant. This allows more flexibility between harvest and selling.

Pick peppers when 80% ripe.

Store out of direct sunlight, ideally with some airflow.

Flavour:

In terms of marketing it's good to have a diversity of tomato types to accommodate different tastes.

Pests and Diseases:

Botrytis is common to avoid keep the air warm and dry. Prune leaves below first developing fruit cluster, this will also help fruit ripen faster.

Usually in unheated greenhouses whitefly and thrips don't tend to get established.

Roll the sides down at night to prevent hornworm whose eggs are laid by a night-flying moth.

Questions from audience:

Do you have a rotation?

Yes, but it not be considered the best. I have two greenhouses, which alternate between tomatoes/peppers and cucumbers. His main concern would be corky root so he uses rootstocks that are resistant.

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Ventilation in your greenhouses, do you have a fan?

No, but it would be better. Rolls up end walls and have a peak vent

When you sited your greenhouses did you account for wind direction?

The greenhouses were actually situated more from a shade perspective, but it worked out favorably for the tunnels to be perpendicular to the prevailing winds.

Do you use manure-based compost and do you have trouble with salt build-up?

Tomatoes are forgiving of salinity but production hasn't been long enough to notice problems. It is an issue that might have to be dealt with by allowing houses to flush out salt.

Landscape fabric: do you pin it down?

Yes, using soil staples every meter and a third, tight up against plants. Uses Black on white plastic with white side up because it prevents germination of weed seeds and also white plastic reflects light and can still be used by the plant.

Do you have trouble with aphids?

Not particularly and that might be because fertility is managed carefully.