

Pest control (topics like broadmite, TYLCV, bacterial blights)

- Crop observation and recognize the disease.
- Create the best plan to control.
- Hygiene

Crop protection

Crop observation and recognize the disease.

First goal is that we observe and found out what we see.

We start with the top 4 diseases.

Crop protection

Broadmite's.

Those insects we cannot see them by eye, difficult to see them by magnifying glass.

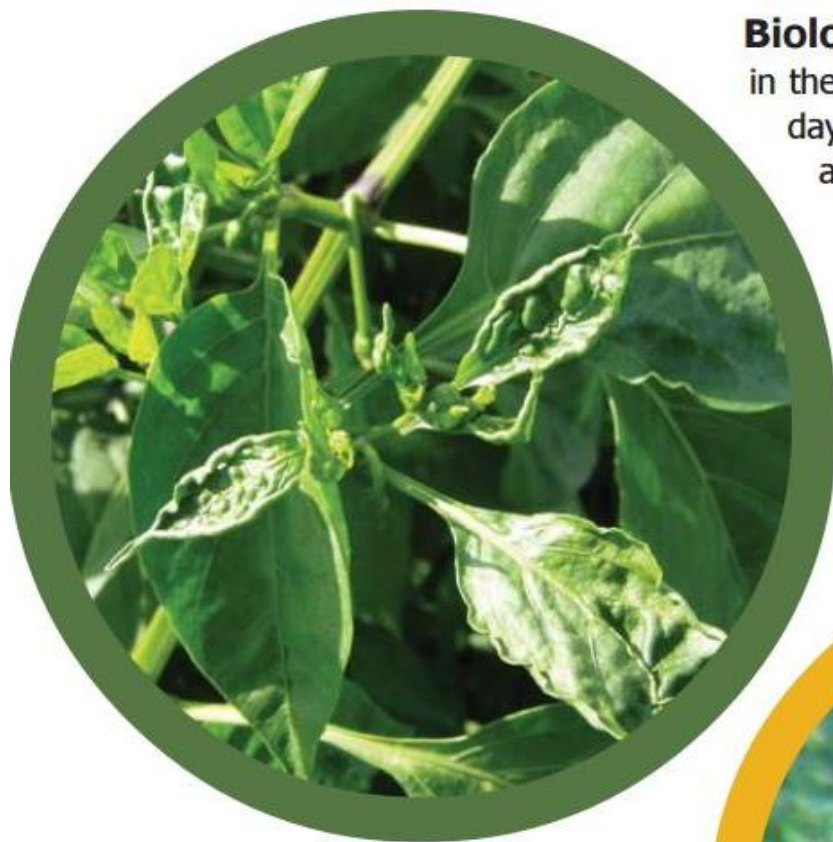
The key to identifying this specific mite is its characteristically unique eggs, which appear to be nearly transparent with evenly spaced white specks or dots across the top, sometimes referred to as a “jewel box”. The adults are yellow to brown, range from 0.1-0.3 mm, and are equipped with four sets of appendages. The hind two are typically used to transport the milky colored immature mites, which have not developed the last set of appendages yet.



Crop protection

Broadmite's

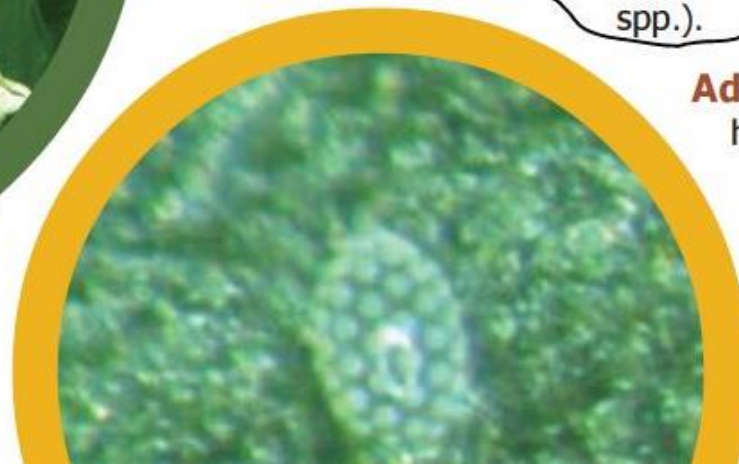
Where do they come from?



Biology & Lifecycle: Eggs are laid singly on the undersides of apical leaves, in the depressions of small fruit and on flowers. The larval stage feeds for 2-3 days and develops into a quiescent nymphal stage. The life cycle only requires about 7 days under optimal conditions of 75°F and high humidity. The mites can disperse by hitching a ride on the legs of adults of the sweetpotato whitefly, *Bemisia tabaci*.

Environmental Factors: Broad mites may be present year round, but are more abundant during the warmer months in the spring and fall. The mite may overwinter on volunteer crop plants and weeds, including pigweed (*Amaranthus* spp.), beggartick (*Bidens* spp.), jimson weed (*Datura* spp.) and galinsoga (*Galinsoga* spp.).

Adult: Very small, requiring a 14X hand lens to be observed (**Figure 4**). Whitish and oval with four pairs of legs. Females have a white stripe on their backs and whip-like hind legs. Males are smaller than the female, lack the stripe and carry the females with enlarged hind legs (**Figure 3**).



Crop protection

Broadmite's

Where do they come from?

People walking in the weeds, and host plants at the border of the greenhouse are a risk.

HYGIENE!

Photos 4 types of
Amaranthus



Crop protection

Broadmite's

How do we recognize them?

This cucumber plant was already at a young stage effected with the broadmite.



Crop protection

Broadmite's

How do we recognize them?

Tomato, typical malformed leaves



Crop protection

Broadmite's

How do we recognize them?

Tomato, typical malformed leaves

This is the right
moment to act!



Crop protection

Broadmite's

How do we recognize them?

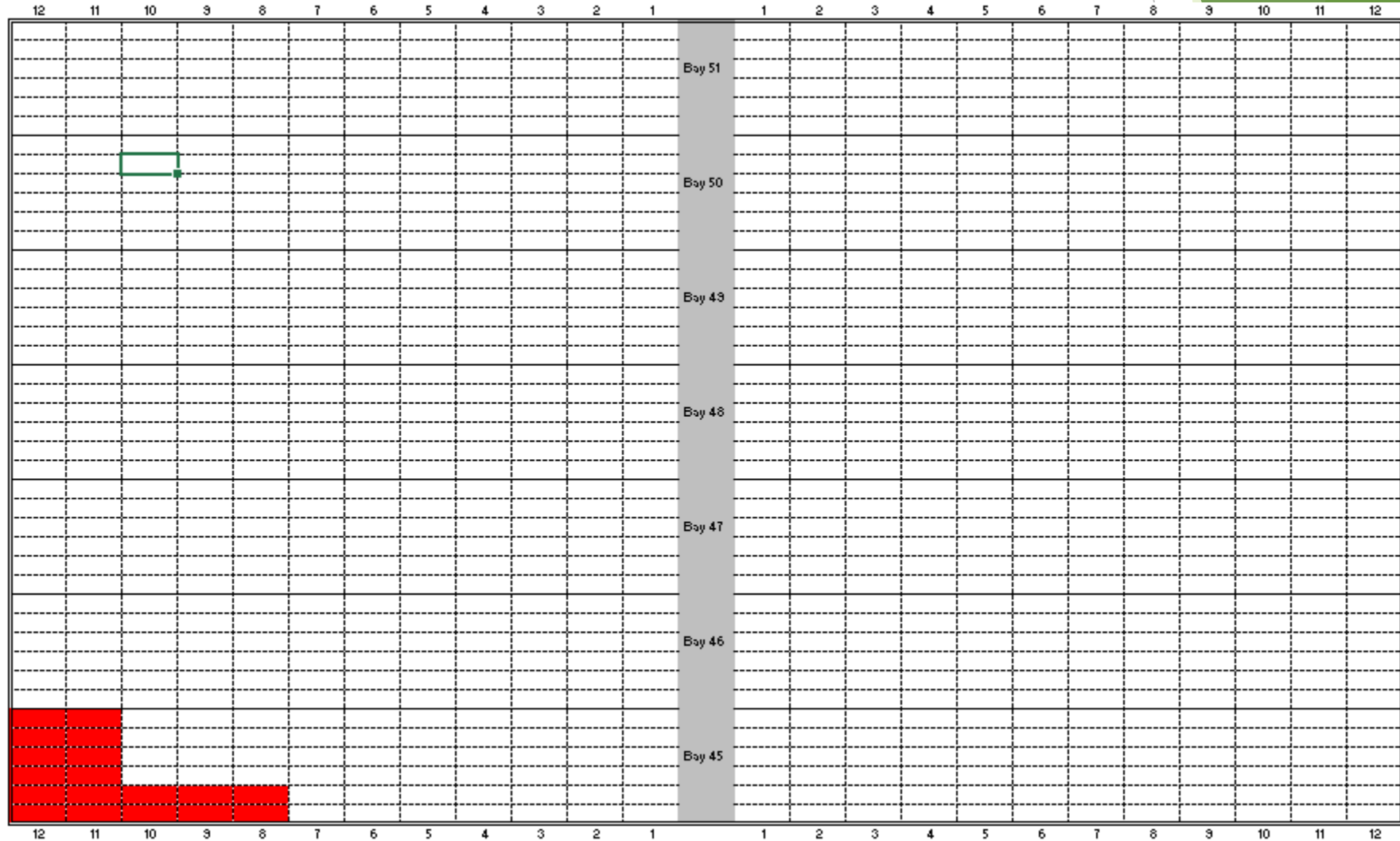
In peppers it is more common.



Crop protection

Broadmite's

How do we report this?



Block 3

B
S
T

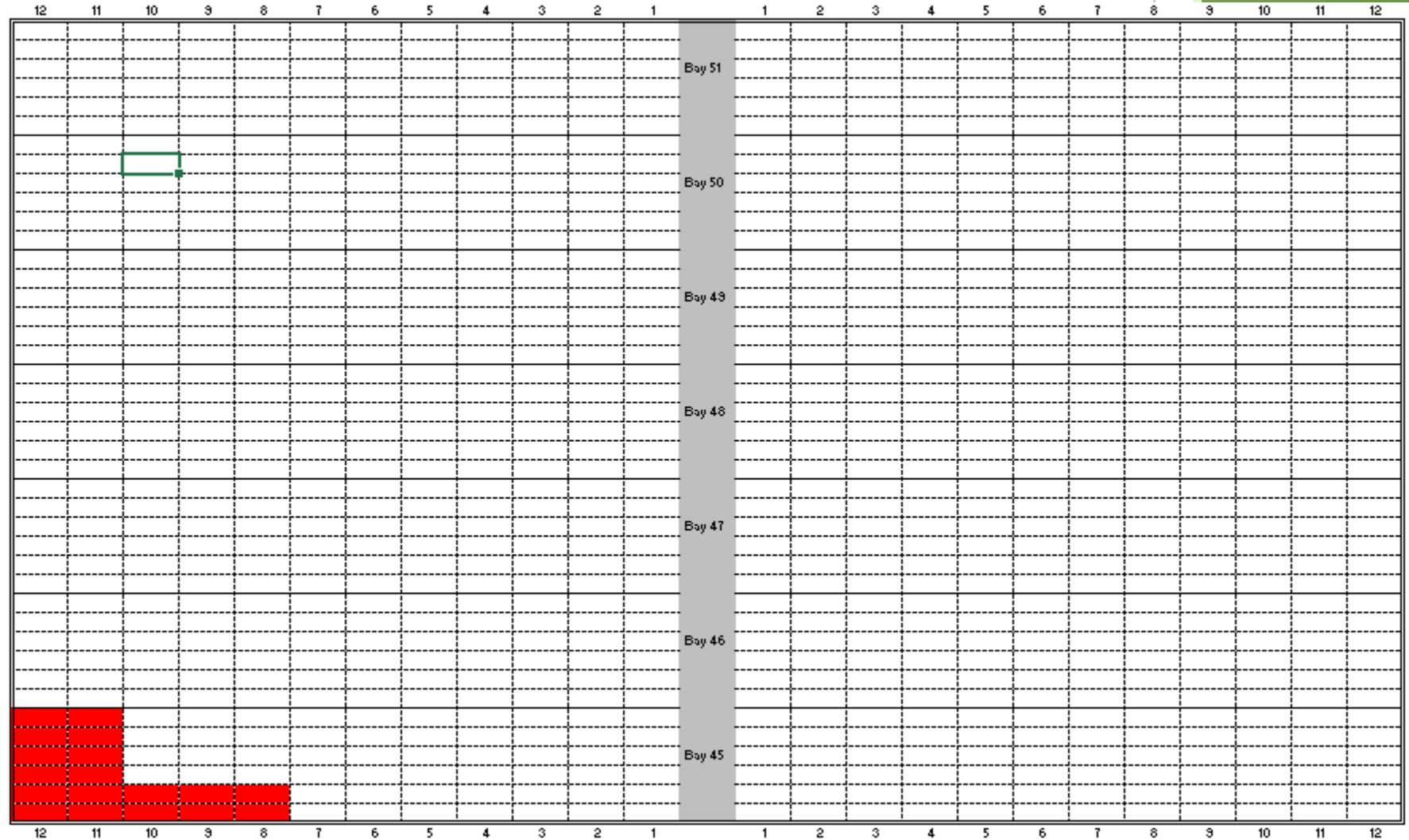


Crop protection

Broadmite's

How do we report this?

What will be the action?



Block 3

B
S
T



Crop protection

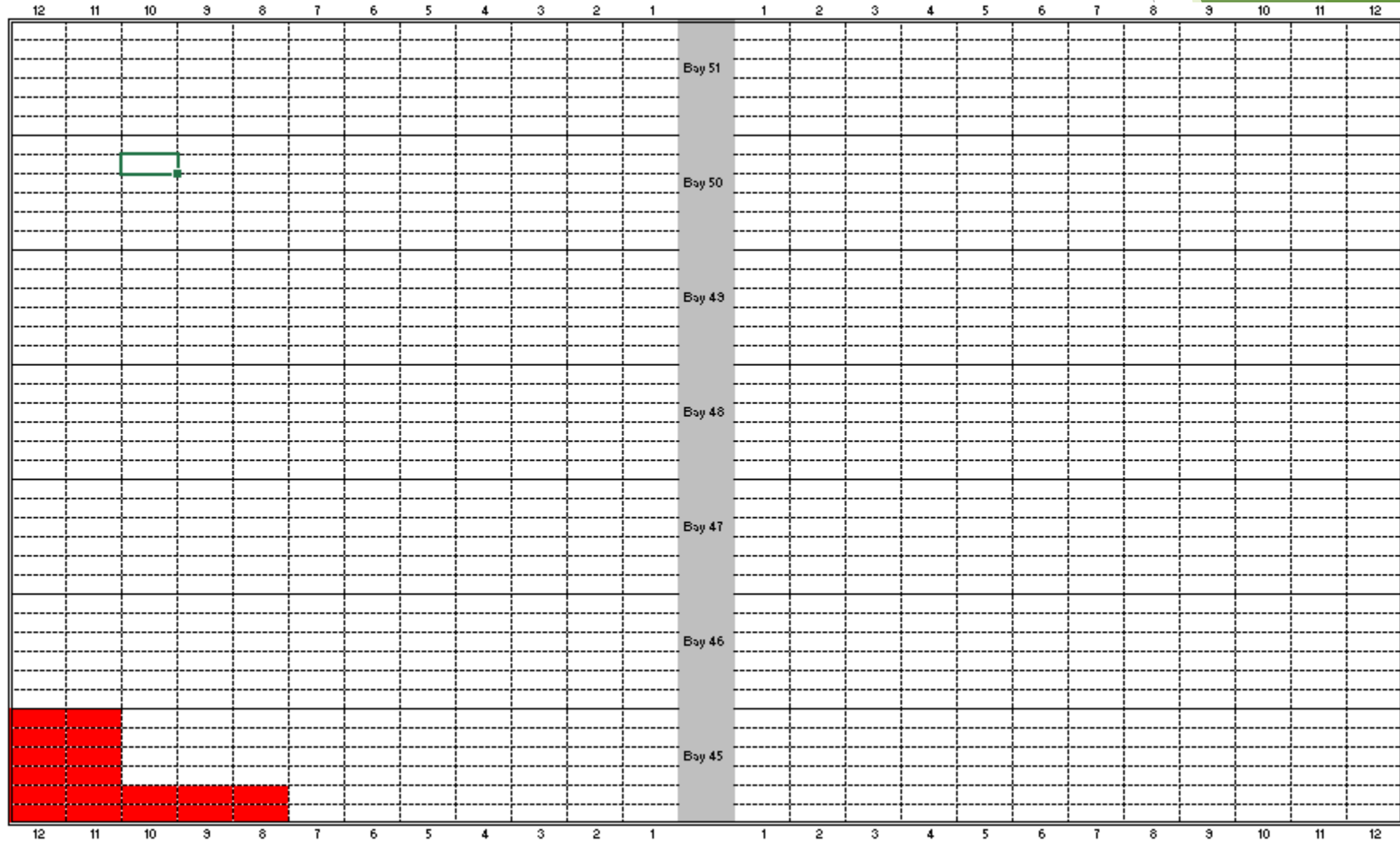
Spotspray = residue use of chemicals.

Broadmite's

How we report this?

What will be the action?

How do we control this?



Block 3

B
S
T

Crop protection

TYLCV

Tomato yellow leaf curl virus, TYLCV causes the most destructive disease of tomato, and it can be found in tropical and subtropical regions causing severe economic losses. This virus is transmitted by a whitefly *Bemisia tabaci*, commonly known as the silverleaf whitefly or the sweet potato whitefly.

The primary host for TYLCV is the tomato plant, and other plant hosts where TYLCV infection has been found include eggplants, potatoes, tobacco, beans, and peppers.



Crop protection

TYLCV

First point is to select a resistant variety!



Plant habit:	Indeterminate
Relative maturity:	Medium
Fruit shape:	Round
AFW gm:	260-300 gm
Features:	Indeterminate hybrid tomato; plant with good vigor, short internodes and good heat tolerance. Fruits are apple green, bright red in color and firm. Very good yielder with an outstanding disease resistance package. Suitable for passive greenhouse and open field
Resistances:	(HR) ToMV:0-2/TSWV/Ff:1-5/Fol:0,1/Va:0/Vd:0 (IR) TYLCV/Ma/Mi/Mj

Crop protection

TYLCV

First point is to select a resistant variety!

HR HR: high resistance

IR IR: intermediate resistance

ToMV:	Tomato mosaic tobamovirus
Ff:	Fulvia fulva (earlier Cladosporium fulvum)
Va:	Verticillium albo-atrum
Vd:	Verticillium dahliae
Fol:	Fusarium oxysporum f. sp. lycopersici
For:	Fusarium oxysporum f. sp. radices
TSWV:	Tomato spotted wilt virus
On:	Oidium neolyopersici
Sbl:	Stemphylium botryosum f. sp. lycopersici
TYLCV:	Tomato yellow leafcurl virus
Mi/Mj/Ma	Meloidogyne incognita, M. javanica, M. arenaria



Plant habit:	Indeterminate
Relative maturity:	Medium
Fruit shape:	Round
AFW gm:	260-300 gm
Features:	Indeterminate hybrid tomato; plant with good vigor, short internodes and good heat tolerance. Fruits are apple green, bright red in color and firm. Very good yielder with an outstanding disease resistance package. Suitable for passive greenhouse and open field
Resistances:	(HR) ToMV:0-2/TSWV/Ff:1-5/Fol:0,1/Va:0/Vd:0 (IR) TYLCV/Ma/Mi/Mj

Crop protection

TYLCV

Second point is crop protection (also for the other disease)

Where do we start?

Crop protection

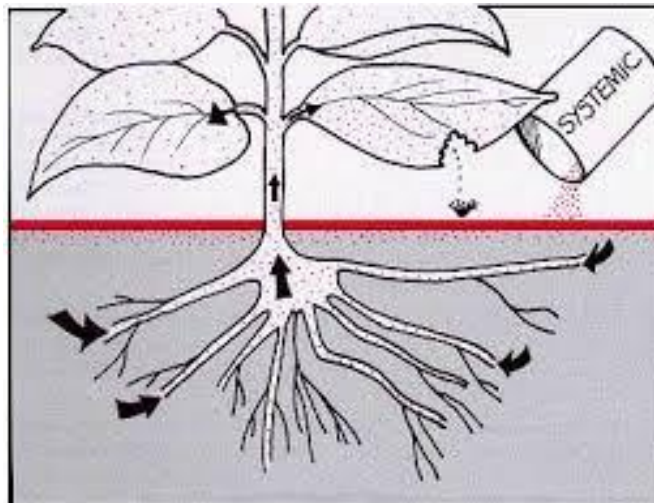


TYLCV

Second point is crop protection (also for the other disease)

Where do we start? Yes, at the young plant raising, and with a systemic product!

Can be sprayed, and be irrigated at the Young Plant Raising



Product Overview

Actara[®] insecticide offers vegetable growers a fast-acting and long-lasting option when combating sucking and chewing insect pests during the growing season. With Actara in a product lineup, growers can expect higher yield potential and better crop quality due to the product's many benefits. It is foliar-applied and contains the active ingredient thiamethoxam. Actara is labeled for use on brassica, cucurbit, fruiting, leafy and root vegetables.

Key Benefits

- Controls many sucking and chewing insect pests
- Rapidly penetrates the leaf surface
- Translaminar and locally systemic activity establishes an insecticide reservoir within treated leaves
- Rainfast upon drying
- Long residual control
- Low use rates
- Compatible with Integrated Pest Management (IPM) programs
- Excellent compatibility with other crop protection products
- Favorable mammalian and environmental profile

Application Details

- Apply Actara through ground or aerial application.
- Apply Actara using spray nozzles that provide medium-sized droplets and offer an accurate and uniform spray deposition and a reduction in spray drift

Crop protection

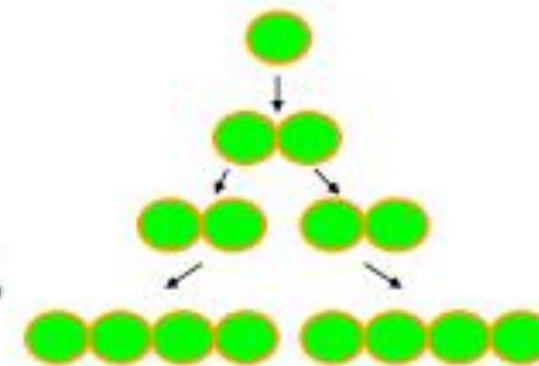
Ralstonia

Big risk for spreading, we need to remove the infected crop, use a plastic bag to remove.

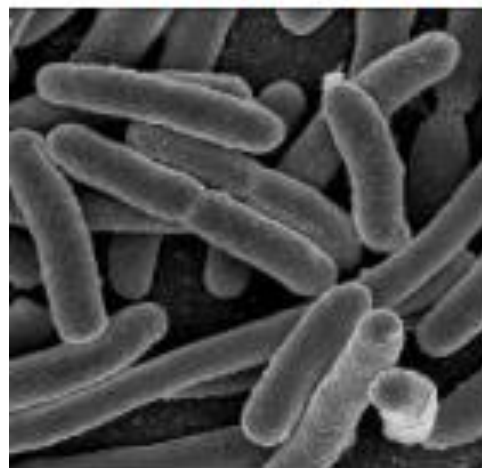
Spray with the knapsack on the infected area with chlorine (sodiumhypochlorite 100 ppm = 30 ml on 10 liter of water)

Bacterial diseases in crops, more and more

- One cell
- Fast reproduction
- Mostly wet rotting spots
- E.g. Clavibacter, Xanthomonas, Pseudomonas, Agrobacteria, Ralstonia, Erwinia



1 bacteria can develop in 24 hours
to 8 million bacteria



Crop protection

Ralstonia

Big risk for spreading, special with our HANDS and TOOLS.

Introduce Virkon S at this area!

Name	Bacteria	Fungi	Virus	pH 1 2 3 4 5 6 7 8 9	Disinf In-org-M	Disinf Organ. M
Per-acids (Jet 5)	++	+	+		+/-	+
Quaternair am- monium (Menno ter forte)..3h-/-	++	-	-		+	++
Benzoic acid (menno clean)	+	+	+		+	+
Alcohol 70%	++	+	+		-	-
Virkon S	++	++	++		-	?



Ruscus-PAC
 Consult for the best
 growth management

Crop protection

Powdery

Easily to recognize, but still a big problem.

- At the right end of block 15 heavily infections.



Crop protection

Powdery

Easily to recognize, but still a big problem.

- At the right end of block 15 heavily infections.

How can we make this more visible?
Can this be a problem of the spray team?



Crop protection

Powdery

Easily to recognize, but still a big problem.

- At the right end of block 15 heavily infections.

How can we make this more visible?
Can this be a problem of the spray team?



Crop protection

Powdery

Easily to recognize, but still a big problem.

- At the right end of block 15 heavily infections.

How can we make this more visible?
Can this be a problem of the spray team?

Brandname:
Active ingredient:
Working:
Application:

Prosper
Spiroxamine
Systemic
Spray



Hygiene

Hygiene

- Discipline of all the team members.
- Disinfect hands and boots.
- Do not mix team members with other blocks.
- Check each other, special the maintenance team!
- Avoid debris, weeds (also weeds around the greenhouse need to be removed).

Hygiene

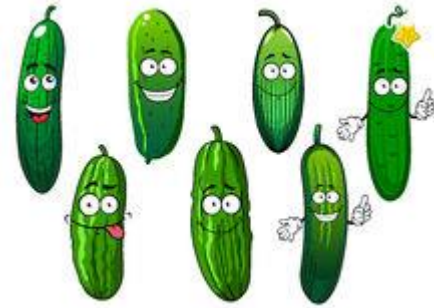
Chlorine 100 ppm
 3 liter SodiumHyperChlorite 3.5%
 on 1000 liter.

Name	Bacteria	Fungi	Virus	pH		Disinf. In-orgM	Dininf. Org.M
				1 2 3 4 5 6 7 8 9			
Peroxide (+ acid) Easy clean, horti clean)	+	+	+			-	+
Sodiumhypochoride	++	+	+			-	++
Fluor (glass etching)	--	--	--				
Formaline	++	+	+			-	++
Strong Acids, Bases	++	+	+			++	+

Hygiene

Removing old crop + disinfect the block.

Simple with Chlorine (ECA or SodiumHyperChlorite)



How do we follow up those points?

