Technical Bulletin #66:

Damping Off

Damping off is a fungal disease caused by one or several of the following pathogens: *Phytophthora, Pythium, Fusarium* and *Rhizoctonia* (there are others but these are the most common). All of these pathogens are soil-borne fungi that may infect young plants (seedlings) in the very early stages of growth (when the stem is still very soft - not older than two weeks after transplanting).

Cucurbits and solanaceous plants are especially susceptible to this problem.

Symptoms:

First you will see the recently transplanted plants wilting. If you take a close look at the base of the stem there will be a small discolored depression. Later the plants will begin to bend over and the lesion will be larger and turning dark brown. Once the lesion completely strangles the stems the plant will die.

Once the disease has infected a plant, it is very difficult to cure. Therefore if a plot has a history of damping off problems, it will be better to do preventative treatment.

The most common reasons why the seedlings get the disease:

1. Seedlings are weak (stressed) or injured therefore the pathogen can easily enter the cell walls.
2. Infected seed trays or substrate (planting media).
3. Infected soils.
4. Seedlings planted too deep. If the stem is buried too deep it may be injured while growing out of the soil, allowing pathogens to enter the damaged cell walls.
5. Mechanical damage when transplanting - roots are broken or stems scratched.
6. Seedlings that are transplanted too close to the drip hose or to the plastic mulch can experience damage on the soft skin of the stem during high temperatures.
7. Irrigating too late in the day which promotes humid soils at night, making the fungal pathogen conditions excellent for growth.

What we can do to avoid this problem:

1. Use disinfected seed trays and sterilize the planting media (soil or substrate).

2. Plant the seedlings at the right depth.

3. Liming the soil to pH 6.5-7.0 can reduce wilt.

4. Be sure not to plant too close to the drip hose or the plastic mulch.

5. Lay the plastic mulch so it is in contact with the soil. If space is left between soil and plastic, a tunnel effect will be produced and very hot air will circulate in that space which will cause severe stress to the plants.

6. Do not over water and initiate the last irrigation no later than 2:00 pm to avoid high humidity at night. However be sure not to keep the seedling too dry because in that case *Rhizoctonia* can infect the seedlings.

7. Do not add too much nitrogen (follow Cambodia HARVEST recommendation) because this can lead to soft stems that can injure and allow for easier entry for the disease.

8. If the plot has a history of damping off problems, it is better to apply a systemic fungicide just before transplanting (one or two days before transplanting).

How to control the disease:

Once the seedlings are infected it will be too difficult to cure them entirely. It is recommended to apply a fungicide to protect the non-infected seedlings.

From the list of authorized fungicides we can use:

1. Metalaxyl - this is a systemic fungicide that can control many types of fungal disease. For damping off it can be applied to the stem as a drench or also as a foliar spray because it is easily absorbed by the plants. If damping off problems are suspected you can spray the seedlings before transplanting or just after transplanting. In Cambodia the registered products containing Metalaxyl (active ingredient) are Kalaxy 35WP, Mataxyl 25WP, Mataxyl 500WP, and Lambac 35SD.

2. Thiram - this is a contact fungicide, usually used as a seed treatment to prevent damping off problems. Thiram can be sprayed, but is generally less effective than Metalaxyl.

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