BALL TECH ON DEMAND™

TOMATO

Sanitation and disease-free inputs are vital to control bacterial leaf spot (BLS) and Tomato Brown Rugose Fruit Virus (ToBRFV).

- BLS and ToBRFV can spread rapidly in the greenhouse. Strict sanitation is critical to control outbreaks.
- Isolate production blocks to prevent mechanical spread by personnel or equipment.
- Thoroughly clean all equipment and production areas between production cycles.
- Use disposable gloves and have crews change gloves frequently when handling or managing tomato crops.
- Always use seed tested for BLS and ToBRFV to reduce, but not eliminate, the possibility of infection.
- Refer to 'Sanitation for @Risk Crops' for additional tips to make sure you have reduced the risk of spreading this disease within your production.
- ***Growers are responsible for controlling BLS and ToBRFV in their operations.***

Tomato @ *Risk Crop*

*Tomato bacterial leaf spot (BLS) is a seed-borne disease that is easily spread mechanically and by splashing water. Tomato Brown Rugose Fruit Virus (ToBRFV) is also seedborne and can be easily spread via handling and contact with contaminated equipment. If not managed throughout production, both diseases will cause serious plant losses. Ball has worked diligently to minimize the risk, BUT growers are **solely responsible** for growing certified seed, maintaining clean cultural conditions, and applying correct bactericides to suppress BLS.*

Bactericides to Control BLS

- Copper (Cu)-based bactericides are the most effective chemicals to control BLS
- Cu is a protectant and is not curative once BLS infections begin. Apply Cu bactericides every 5–7 days when disease pressure is low and every 3–5 days when disease is present.
- Cu is easily washed off the foliage after irrigating. Trials have shown that >50% of the copper residue is gone after 2 days when overhead irrigation is used.
- Tank mix of Cu compounds and Mancozeb have shown to be more effective than copper alone.

ToBRFV Control Strategy

- This viral pathogen that is not known to originate in the US. Therefore, control hinges upon exclusion, monitoring for disease symptoms, and destroying infected plants ASAP.
- ToBRFV behaves similarly to Tobacco Mosaic Virus (TMV) and spreads very easily via plant-to-plant contact or workers handling plants/contaminated equipment.
- Insect vectors have not been observed; pest management will not reduce ToBRFV transmission.

PLUG CULTURE

STAGE 1 – Time of radicle emergence (2–3 days)

- Soil temperature 70–72°F (21–22°C).
- Keep media evenly moist but not saturated.
- Cover the seed lightly with coarse vermiculite.
- Tomato is very sensitive to high salts, particularly high ammonium, during germination.

STAGE 2 – Stem and cotyledon emergence (7 days)

- Soil temperature 68–70°F (20–22°C).
- Reduce moisture levels once radicle emergence occurs! Allow the soil to dry out slightly before watering for best germination and rooting.

STAGE 2 (cont.)

- Irrigate early in the day so foliage is dry by nightfall to prevent disease.

STAGE 3 – Growth and development of true leaves (10–14 days)

- Soil temperature 60–65°F (15–18°C). Cooler temperatures will minimize stretching.
- Use DIF whenever possible, especially the first 2 hours after sunrise, to control plant height.
- Allow the soil to dry thoroughly between irrigations but avoid permanent wilting to promote root growth and control shoot growth.
- Sumagic (2.5–5 ppm) applied early in stage 3 will control hypocotyl stretch.

STAGE 4 – Plants ready for transplanting or shipping (7 days)

- Soil temperature 60–62˚F (16-17˚C).
- Allow soil to dry thoroughly between irrigations.
- Maintain soil pH 5.5–5.8 and EC less than 0.75 mmhos/cm.
- Fertilize with a balanced fertilizer at 50–75 ppm N as needed.

FINISHED CULTURE

TEMPERATURE

- Night: 55–65˚F (13–18˚C)
- Day: 60–70˚F (16–21˚C)

LIGHT

- Provide as high light intensity as possible while maintaining moderate temperatures.

MEDIA

- Use a well-drained, disease-free soilless medium with a medium initial nutrient charge and a pH 5.5–6.3.

FERTILIZATION

- Fertilize every third irrigation with a balanced fertilizer at 50-75 ppm nitrogen.
- Low N or K coupled with high Ca and Mg are associated with increased BLS. Using high levels of dolomitic limestone and no fertilization strategies can increase BLS.
- Maintain medium electrical conductivity around 1.0 mmhos/cm (using 1:2 extraction).

CONTROLLING HEIGHT

- Once plants are rooted to the sides of the containers allow plants to wilt prior to irrigation to provide some height control.
- Withholding fertilizer, especially phosphorous and ammonium-form nitrogen will reduce stretching.
- Tomatoes are responsive to day/night temperature differential (DIF), and are shorter with a negative DIF.
- Sumagic (2–10 ppm) can be applied as foliar spray when 2–4 true leaves are present. Repeat applications may not exceed 10ppm, and cannot be made 14 days after 4 leaf has unfolded.

**Be sure to read pesticide labels before use and follow all label instructions.*

For more info on these diseases: Cornell University Tomato Disease Info, Michigan State ToBRFV Info
Find more resources: https://www.ballseed.com/QuickCulture/ProductionGuides/
Tech On Demand Podcast: https://www.growertalks.com/TechOnDemand/