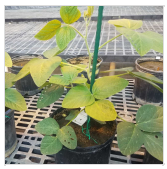

Version 2

Jul 07, 2021

Growing Soybean in the Greenhouse V.2

Lynn Doran[1]

[1]Realizing Increased Photosynthetic Efficiency (RIPE)

dx.doi.org/10.17504/protocols.io.bwenpbde

Burgess Lab UIUC

Lynn Doran
Realizing Increased Photosynthetic Efficiency (RIPE)

ABSTRACT

Protocol for planting, germinating, and growing soybeans in the UIUC RIPE or ACES Plant Care Facility greenhouse. Has been verified on Petite Havana and Samson cultivars.

DOI

dx.doi.org/10.17504/protocols.io.bwenpbde

PROTOCOL CITATION

Lynn Doran 2021. Growing Soybean in the Greenhouse. **protocols.io**
https://dx.doi.org/10.17504/protocols.io.bwenpbde
Version created by Lynn Doran

KEYWORDS

Greenhouse, Soybean, Planting

IMAGE ATTRIBUTION

Lynn Doran

CREATED

Jul 07, 2021

LAST MODIFIED

Jul 07, 2021

PROTOCOL INTEGER ID

51374

GUIDELINES

Temperature
25°C day/ 23°C night (77°F/73°F)

Lighting
Natural lighting in a greenhouse can range anywhere from 0-2000 µmolm−2 s−1. Supplemental lighting can increase the photosynthetic photon flux densities (PPFD) on cloudy days or to extend day length. Even the most advanced lighting systems only reach 500 µmolm−2 s−1 unless mounted very close to the crop canopy.

Please Note The RIPE greenhouse is equipped with dual walled acrylic glazing and on clear summer days the PPFD is close to 2000 µmolm−2 s−1. Supplemental lighting is provided in all bays with 1000W high pressure sodium fixtures which provide around 400 µmolm−2 s−1 at the plant level. Daylength is set to 12 hours of supplemental light. If you want to grow a variety that is sensitive to daylength, we have a blackout tent with air circulation that can be used.

Additional supplemental lighting options may be available in the ACES Plant Care Facility.

Day Length
16 hour day at up to 1000µmol

Humidity
>35%

Fertility
When juvenile, fertilize weekly with 15-5-15 fertilizer, similar to Peter's 15-5-15 Cal-Mag. When they get closer to flowering, fertilize twice weekly. At harvest after full pod set, discontinue fertilizer to encourage senescence.

Water Guidelines
Water lightly once daily until germination is complete. Water twice daily when plants are juvenile. Watering protocol may need to be adjusted due to light intensity and humidity changes from winter to summer. Reduce watering after full pod set to encourage senescence.

Air Flow
Adequate air circulation between plants is required to reduce disease pressure. If your plants are all gently swaying in your growth space, you most likely have adequate airflow.

Please Note The RIPE greenhouse currently has two strong circulation fans in each bay, oriented at a downward angle providing circular airflow. For situations involving seedlings or close spacing we have installed a large oscillating fan in Bay 1 to increase airflow if necessary.

References:
Donald Danforth Plant Science Center Plant Growth Facility, June 2016

MATERIALS TEXT

- Classic 1000 pots, available in the ACES Plant Care Facility Storeroom with a valid CFOP
- Soil, Soybean Mix or Vodkin Mix
- Plastic plant label stakes (A.M. Leonard VP-PS6), available in the ACES Plant Care Facility Storeroom with a valid CFOP

SAFETY WARNINGS

Annual Worker Protection Standard training required to work in greenhouse. Contact UIUC ACES Plant Care Facility Coordinator to arrange training.

UIUC RIPE Greenhouse online training required to work in UIUC RIPE greenhouse. Contact UIUC RIPE Greenhouse Manager to arrange training.

Citation: Lynn Doran (07/07/2021). Growing Soybean in the Greenhouse. https://dx.doi.org/10.17504/protocols.io.bwenpbde

BEFORE STARTING

Work with RIPE greenhouse to reserve space and materials approximately one month or more before planting or if using ACES Plant Care Facility reserve space using the Project Space Request Form and request soil using the Soil Mix Request Form. Soybean mix or Vodkin mix are the recommended soil types for greenhouse soy cultivation.

If planting transgenic plants, review all USDA-APHIS requirements for the applicable APHIS permit for handling transgenic materials before beginning any experiment.

1 Fill classic 1000 pots to within a half inch of the brim with soil. Tamp the soil down firmly with your hands.

2 Water the soil in thoroughly. The soybean soil mixes contain high levels of sand and drainage is slow. It may take several hours for the soil to be saturated and to drain any standing water.

The soil could be saturated and allowed to drain the night before planting.

Citation: Lynn Doran (07/07/2021). Growing Soybean in the Greenhouse. https://dx.doi.org/10.17504/protocols.io.bwenpbde

3 ⚠

Lay the soybean seed on top of the soil. Push it a few centimeters deep into the damp soil, just enough to be able to cover it with soil. Do not plant the seed more than a few centimeters deep.

Typical planting depth in the field for soybean is 1-1.5". That is too deep for the Vodkin or Soybean soil mixes in the greenhouse. If the soybean is planted more than a few centimeters deep in the greenhouse, it is likely to rot prior to germination.

4 Cover the seed with soil and gently tamp the soil down with your finger.

Citation: Lynn Doran (07/07/2021). Growing Soybean in the Greenhouse. https://dx.doi.org/10.17504/protocols.io.bwenpbde

5 If the soil felt dry at the seed planting depth, water thoroughly.

6 Keep seeds moist at the level of planting but do not overwater. A light watering every other day is usually sufficient until germination. Watering can be increased post-germination.

Do not overwater. Soybean seeds will rot in the soil if planted too deeply or overwatered.

7 See "Guidelines & Warnings" section for plant care guidelines following soybean germination.

Citation: Lynn Doran (07/07/2021). Growing Soybean in the Greenhouse. https://dx.doi.org/10.17504/protocols.io.bwenpbde