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Growing Soybean in the Greenhouse

Lynn Doran¹¹Realizing Increased Photosynthetic Efficiency (RIPE)

1 Works for me

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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.

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KEYWORDS

Greenhouse, Soybean, Planting

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IMAGE ATTRIBUTION

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GUIDELINES

Temperature

25°C day/ 23°C night (77°F/73°F)

Lighting

Natural lighting in a greenhouse can range anywhere from 0-2000 $\mu\text{molm}^{-2} \text{ s}^{-1}$. 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 $\mu\text{molm}^{-2} \text{ s}^{-1}$ 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 $\mu\text{molm}^{-2} \text{ s}^{-1}$. Supplemental lighting is provided in all bays with 1000W high pressure sodium fixtures which provide around 400 $\mu\text{molm}^{-2} \text{ s}^{-1}$ 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 1000 μmol

Humidity

>35%

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.

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.

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.



- 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.