



## Dry root rot disease assays in chickpea

Dry root rot is one of the major disease known to affect the chickpea cultivation around the world. The disease is caused by fungal pathogen, *Rhizoctonia bataticola*. Here we present two simple protocol for disease assay which can be employed to screen and identify resistant cultivars/genotypes.

### 1. Blotting paper technique

- Surface sterilize the chickpea seeds with 2% sodium hypochlorite
- Sow the seeds in 15-cm height pot containing Soilrite
- Uproot the 8 days old seedlings, wash under running tap water and rinse with sterile water twice
- Inoculate Potato dextrose broth with *R. bataticola* and incubate at 28°C for 5-days with 180 rpm in a shaker
- Dip only the roots in inoculum and remove the excess inoculum
- Place pathogen inoculated and mock (water) inoculated plants in separate blotter paper
- Keep the trays with plants at 28±2°C for eight days with 16 h artificial light and relative humidity at approximately 70% and moisten the plants every day with adequate water
- Inspect for root damage on 8 days after inoculation

### **Advantages:**

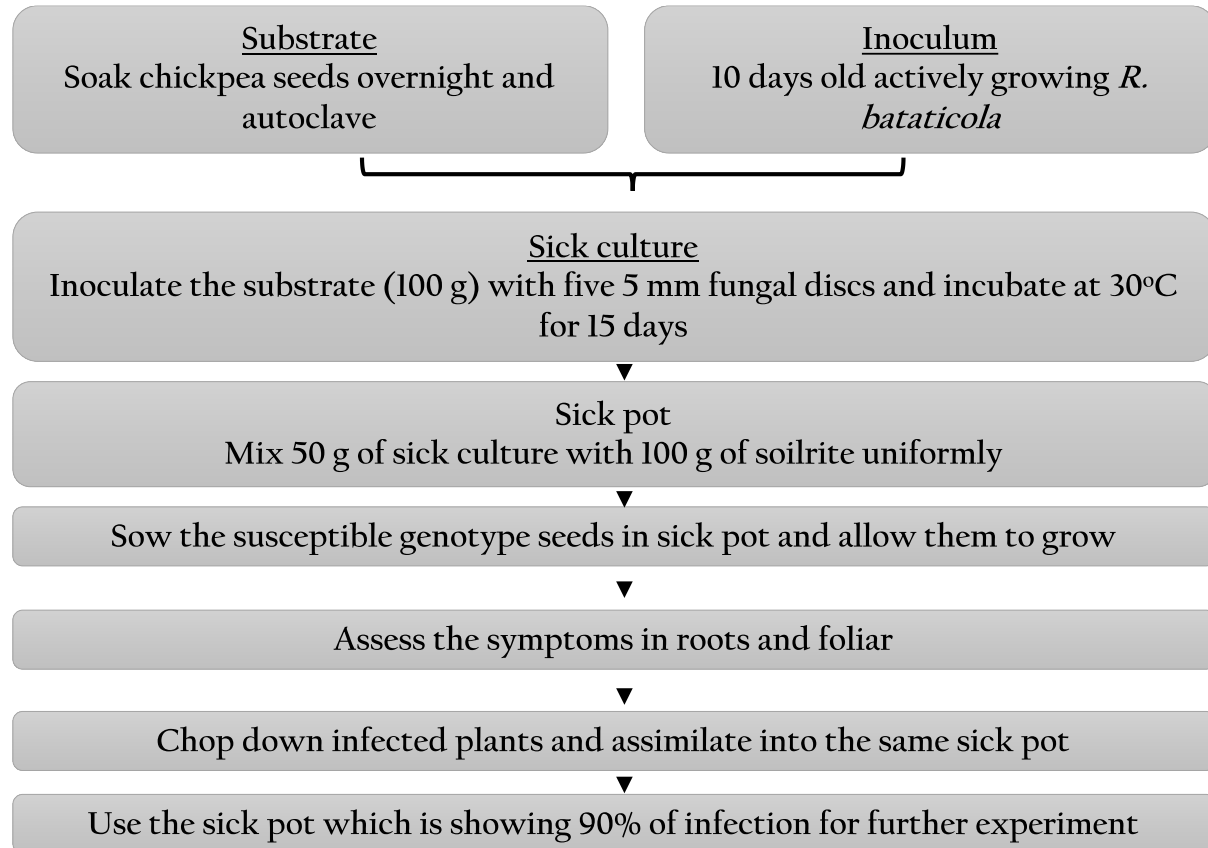
- Screen chickpea genotypes under laboratory conditions.
- Dip inoculation enables the investigation of interaction on a temporal basis with easy control over inoculum load and facilitates in vitro screening.
- Furthermore, even young seedlings can be used.
- Five-day-old fungal culture can yield enough inoculum to infect the plants.
- Liquid inoculum contains both mycelia and microsclerotia.
- Root rot symptoms can be used to score the disease and identify resistant genotypes.

### **Disadvantages:**

- Drought stress imposition is impossible
- Screening with this technique will not reflect natural responses



## 2. Sick plot technique



### **Advantages:**

- Interactions among plants, pathogens, and drought stress.
- Plants show typical DRR symptoms in the sick pot method.
- In a sick pot, drought stress can be imposed at any age of the plant and screen the plants.
- Plants subjected to combined drought and pathogen infection showed severe root rot as compared to pathogen-only treatment.
- Screen the genotypes under combined drought and pathogen stress to identify resistant genotypes.
- Several studies were attempted earlier to screen the genotypes but by using blotting paper technique.
- Besides, field screening has also been conducted but without imposing drought stress.
- It is crucial to impose drought stress during different stages of chickpea and assess the genotype response.

**Reference:** Irulappan V, Senthil-Kumar M. Dry Root Rot Disease Assays in Chickpea: a Detailed Methodology. JOVE-JOURNAL OF VISUALIZED EXPERIMENTS. 2021 Jan 1(167).