

SCREENING ONION FOR RESISTANCE TO FUSARIUM OXYSPORUM F. SP. CEPA

Maintain *Fusarium oxysporum* f. sp. cepa in sterilized soil stored at 4 C. Transfer soil to potato dextrose agar and grow at 24 C. Add 3 x 3 mm piece of mycelium to 50 ml of potato dextrose broth in 125 ml Erlenmeyer flask. Grow on rotary shaker approximately 26 C for 3-6 days. Comminute mycelium and broth at low speed on Waring blender 2 minutes. Leave white foam; take only liquid. Centrifuge 10 minutes at 3400 rpm (SS34 rotor) to pellet the spores. Discard supernatant. Resuspend the pellet in distilled water from tap source. May have to make 1:10 or 1:100 dilutions. Count number of spores/ml using a hemacytometer. Place 1 drop of diluted suspension onto water agar and check spore germination after 24 hours.

Place 100 lbs. bag of white silica sand into cement mixer. Calculate ml of concentrated inoculum needed per pan. Add inoculum in a volume of 1000 ml at 4×10^4 spores per gram of sand (50 lbs sand per pan = 22,680 g per pan $\times 4 \times 10^4$ spores per gram of sand = 9.1×10^8 spores per 50 lbs. of sand = 1.8×10^9 spores per 1000 ml). Add to sand. Allow mixer to run for 5 minutes. Pour out and mix thoroughly in a large mixing pan by hand. Return infested sand to 50 x 29 x 11 cm pan. Make 8 rows 1 cm deep. Plant 100 seeds/row. Include resistant and susceptible varieties as checks. Cover seeds. Place pan in water in temperature tank under fluorescent lights. Sand temperature should be 20-22 C. When cotyledons are 0.5-1.0 cm tall, sand temperature should be increased to 28 C. Water or fertilize as needed.

Resistant plants remain healthy. Susceptible onions die. Count number of living and dead onions as soon as all varieties have germinated.. Three to four weeks after seeding, count the number of live onions remaining. Subtract from previous count of live onions to determine the number of dead onions. This is easier than trying to count the number of dead onions after 3-4 weeks because they rot.

Michael J. Havey
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