

In-vitro Trial of Sierra Natural Science SNS AG DC+ Bactericide and Fungicide

March 31, 2023. Acre, Inc. Greenhouse & Laboratory

Materials & Methods-Xanthomonas: Two methods were used to determine the DC+ activity at a dilution rates 1:10, 1:20 and 1:40 compared to untreated disks (UTC). *Xanthomonas* cells were evenly distributed over the surface of potato dextrose peptone agar (PDP). Tests included 3 replications of DC+ and UTC. Holes 0.9 cm diameter were made in the center of Petri dishes containing PDP medium. Holes were filled at 3 rates of DC+ on March 31. UTC was filled with sterile distilled water. The inhibition diameter was determined on April 1.

Table 1. Diameters of Inhibitions zones from application of DC+ at 3 rates (filled wells)

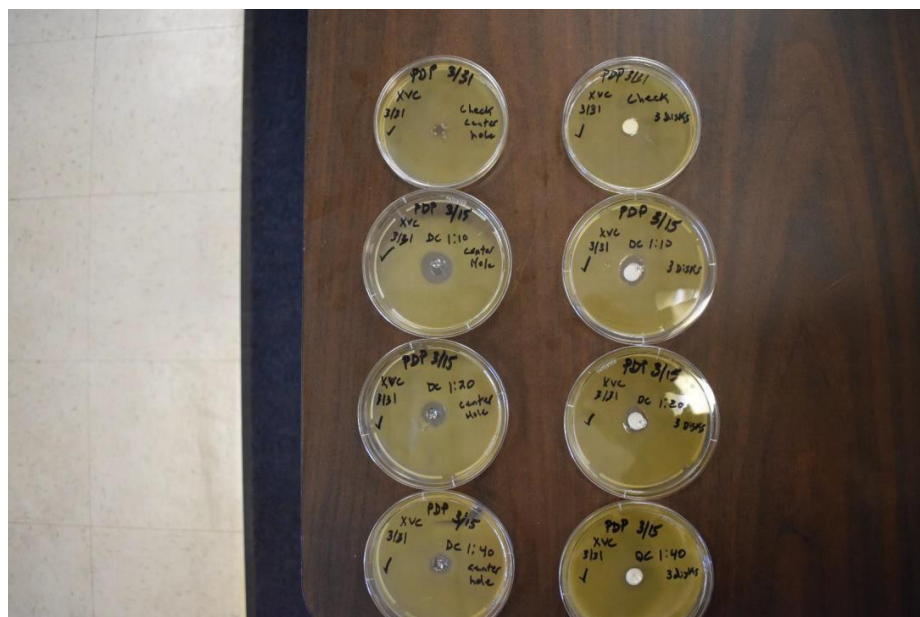
Treatment	UTC	DC+ 1:10	DC+ 1:20	DC+ 1:40
Replications	0, 0, 0	2, 2.5, 2.1	1.5, 1.5, 1.6	0.9, 1.3, 1.5
Average (cm)	0, 0, 0	2.20	1.53	1.23

Materials & Methods: *Xanthomonas* cells were evenly distributed over the surface of PDP agar. Three cellulose disks at 3 rates of DC+ and sterile water were placed on the PDP agar surface. Inhibition zones were measured on April 1 after March 31 treatments.

Table 2. Diameters of inhibition from 3-1 cm disks treatments

Treatment	UTC	DC+ 1:10	DC+ 1:20	DC+ 1:40
Replications	0, 0, 0	2.2, 2.1, 1.6	1.8, 1.9, 1.5	1.3, 1, 1.2
Average (cm)	0, 0, 0	1.96	1.73	1.67

Zones of Inhibition of Xanthomonas from SNS AG DC+ Treatments



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April 11, 2023. Acre, Inc. Greenhouse & Laboratory

Materials & Methods: *Phytophthora cactorum* spores and mycelium were grown in pure culture on potato dextrose agar (PDA}. PDA agar was sterilized and DC+ was mixed at 1:10, 1:20 1:40 in warm agar solution. Petri dishes were filled with DC+ at 3 rates. UTC was PDA only. Agar plugs 0.9 cm of uniformly grown mycelium and spores were inverted and placed in the center of treated and untreated agar. On April 14th inhibition was determined from treated and untreated agar.

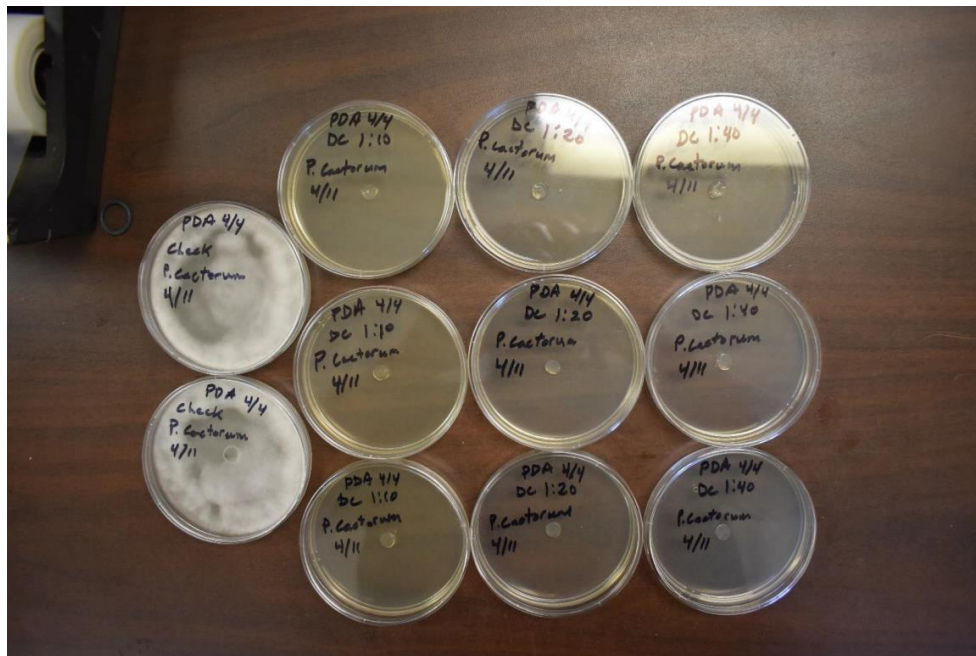
Table 3. Inhibition of *Phytophthora* growth from treated and untreated PDA agar.

Treatment	UTC	DC+ 1:10	DC+ 1:20	DC+ 1:40
Replications (cm}	9 cm	0,0,0	0,0,0	0,0,0
Average	9 cm	0	0	0

There was no inhibition from the UTC.

All rates of DC+ completely inhibited growth of *Phytophthora*.

Complete Inhibition from SNS AG DC+ Incorporated in PDA Agar



Materials & Methods:

The method for determination of activity against the Ascomycota pathogenic fungi was changed. PDA agar was autoclaved, allowed to cool, and DC + was mixed in at 1:10, 1:20, and 1:40. No DC+ was added to the PDA agar to serve as the check. The pure culture of Stemphylium (Ascomycota) was grown and 0.9 cm plugs were taken from the outer edges of the colony to retain uniform growth. Ascomycota/Stemphylium PDA agar plugs were inverted and placed mycelium side down.

Table 4. Average of growth in diameter from 0.9 cm plugs of Stemphylium

Stemphylium	UTC	DC+1:10	DC+ 1:20	DC+ 1:40
Replications(cm}	5.72 cm	0	0.953	3.708

Stemphylium and powdery mildews (e.g., Erysiphe) are in the Phylum Ascomycetes or new name Ascomycota.

Some Common Names Of Plant Pathogens Including But Not Limited To:

The test was made of plant pathogens that are in the 3 groups: Oomycota, Ascomycota and Basidiomycota.

Bacterial plant pathogens include Pseudomonas and Xanthomonas. These cause necrotic spots and specks of vegetable plants.

Other bacterial: Erwinia species, fire blight, soft rots of vegetables.

Key if you have activity against Xanthomonas there will be good control of almost all pathogenic bacterial.

Fungi: Oomycota class- Phytophthora attacks roots, and shoots of vegetable plants, and trees. Causes rot roots and leaf diseases and occurs worldwide. Downy mildews are leaf pathogens and are in the same group as Phytophthora. Pythium is a seedling pathogen which attacks vegetables and many other types of plant seedlings.

Ascomycota: Stemphylium, Alternaria, Fusarium, powdery mildews and many other fungi that infect vegetables, fruits, forest trees.

Basidiomycota: Rusts, smuts, and soil borne fungi that attack roots or many plants. If there is activity against Ascomycota, then there is activity against Basidiomycota.