A New Chemical for Sanitation, Crop Disease Control and Water Treatment

DDAC QUATERNARY AMMONIA

Judy McWhorter
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**DDAC VS ADBAC Quaternary Ammonia**

**ADBAC Quats**

A = alkyl-dimethyl-benzyl-ammonium chloride (ADBAC)

- Superior in pesticidal performance
- Greater Tolerance to:
  - Organic Protein loads
  - pH
  - Temperature changes
  - Hard water

**DDAC Quats**

B = didecyl-dimethyl-ammonium chloride (DDAC)

- Permanently positive charged cationic surfactant
- Formulation modified-removing benzene ring.
- Biodegradable
**ALWAYS CLEAN BEFORE DISINFECTING**

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\begin{array}{c}
\text{CH}_3 \\
\text{C}_n\text{H}_{2n+1} - \text{N} - \text{C}_n\text{H}_{2n+1} \\
\text{CH}_3
\end{array}^+ \\
\text{Cl}^-
\]

**DDAC Quaternary Ammonia**

**KleenGrow™**
Registered Disinfectant, Algaecide, Fungicide, Bactericide and Virucide

**UpTake™**
Registered Soil Wetting Agent and Surfactant

This class of chemical reduces the surface tension, and is attracted to negatively charged surfaces, including microorganisms and chemicals.

Quaternary ammonium compounds denature the proteins of the bacterial or fungal cell, affect the metabolic reactions of the cell and allow vital substances to leak out of the cell, finally causing death.
**Fungicide/Bactericide/Algaecide/Virucide**

- **DDAC Quaternary Ammonia**

- 7-30 day residual. **Broad spectrum control**

- Due to MOA-disruption of cell membrane NEVER a resistant issues.

- Tank mix with other fungicides, insecticides or miticides for MORE effective control

- **Wetting** agent-increases penetration of water through growing media, resulting in improved root growth and plant quality.

- **Cationic Surfactant** offers strong bonding to negatively charged ions.

- **Adjuvant** to improved performance of fertilizers and most pesticides. Add through drip-irrigation systems or tank mixes.
KleenGrow™ In Propagation

KleenGrow as a Seed Dip and Srench for Fusarium and Botrytis Control on Cyclamen

KleenGrow as a Srench on Transplants

% Disease Control

Dr. Janice Elmhirst
Elmhirst Diagnostics and Research
**Bacterial Control**

**KleenGrow™**

**Xanthomonas Control on Geraniums**

- Noninoculated
- Inoculated
- Phyton 27
- KleenGrow
- MilStop
- Cease
- Cease and MilStop

**Erwinia Control on Orchids**

- Water noninoculated
- Water inoculated
- Kocide
- Kocide/KleenGrow
- Camelot
- Camelot/KleenGrow
- KleenGrow
- Agri-Mycin

Dr. Ann Chase
Chase Horticultural Research

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**Always Clean Before Disinfecting**
Bacterial Canker Control

KleenGrow™

Evaluation of Pesticides for Control of Citrus Bacterial Canker on Grapefruit in Florida

- 8. UNTREATED
- 4. Companion
- 5. P-016B
- 3. KleenGrow
- 7. KPX-B1
- 6. KPX-B2

Products Tested

Charles Meister and Jeff Jones
University of Florida

Evaluation of Bactericides for the Control of Bacterial Canker in Greenhouse Tomato

- Inoculated Control
- Badge
- AgriPhage
- Kasumin
- Taegro
- Kleengro

Products Tested

David M. Ingram
Central MS Research & Extension Center
Mississippi State University

ALWAYS CLEAN BEFORE DISINFECTING
Leaf Spot Control

KleenGrow™

Always Clean Before Disinfecting

Alternaria Control

Cercospora Leaf Spot

Dr. Ann Chase
Chase Horticultural Research
Control at Soil Level to Prevent Re-Infection

KleenGrow™

Dr. Ann Chase
Chase Horticultural Research
New Wetting Agent and Surfactant

UpTake™ → DDAC Quaternary Ammonia

Bacterial Blight (Pseudomonas Syringae) Control on Blueberries

No. Blighted Shoots per Plants

- Control
- UpTake full rate
- UpTake + Copper 50W half rate
- Copper 50W full rate

Botrytis Control on Blossom Blight of Highbush Blueberry

Disease Severity

- 1. Control
- 2. Fungicide half rate
- 3. Fungicide half rate + UpTake
- 4. Fungicide full rate

Janice Elmhirst
Elmhirst Diagnostics and Research
IR-4 Opportunity Discussions

What We Know

Efficacy/Crop Safety Studies

• DDAC confirmed as an effective bactericide/fungicide in greenhouse/nursery crops.

• DDAC preliminary studies confirm effective as a bactericide/fungicide in orchard/field crops.

• DDAC greenhouse studies confirm DDAC as an effective wetting agent/surfactant for greenhouse/nursery crops.

• DDAC preliminary studies confirm DDAC as an effective wetting agent/surfactant for turf.
IR-4 Opportunity Discussions

Moving Forward with DDAC
✓ Studies in progress to evaluate efficacy/safety in FL citrus
✓ Studies in progress to evaluate as an effective adjuvant in FL citrus.
✓ Food tolerance studies on broccoli seed dip approved-2010
✓ Exempt from Tolerance when used for as surface disinfectant at <400ppm approved.

IR-4 Assistance
To help expand Food Tolerance – Residue studies on peeled fruit and vegetables to include use as a pesticide spray on crops and post harvest dip at <400 ppm.
✓ Quaternary Ammonia Consortium will need encouragement from IR-4 to support the expanded use.
  • Limiting factor is cost due to lack of awareness of the need.
✓ Other countries such as the Netherlands, New Zealand and Germany have already proposed and increase of the Maximum Residue Limits for DDAC.
✓ Much work has already been done in the requesting countries to support increasing the MRL (Maximum Residue Limits) for DDAC.