Citadel™

- Active Ingredient: Chlormequat Chloride
- Formulation: 11.8% Soluble Concentrate
- Same active ingredient & concentration as Cycocel
- Available in 1 gallon & 30 gallon containers
- Effective for use on a broad variety of ornamental crops; including poinsettias, geraniums, azaleas, hibiscus, bedding plants and other herbaceous and woody plants.
- As a foliar applied spray, Citadel™ is absorbed into the plant through young expanding leaves, mature leaves and stems.
- Through a drench application, Citadel™ is taken up by the roots and transported to the stem tips where it is active.
- Spray rates range from 600 to 2,000 ppm; Application rates for drench treatments range from 2,000 to 3,000 ppm.
Citadel + Dazide Tank-Mixes

- Foliar applications of Citadel plus Dazide 85 WSG have been shown to provide optimum growth reduction and reduced marginal chlorosis.

- This tank mix may be targeted to those crops less responsive to CITADEL used alone.

- Recommended rates for the CITADEL and DAZIDE 85 WSG tank-mix are shown below:

<table>
<thead>
<tr>
<th>ACTIVITY</th>
<th>CITADEL (ppm)</th>
<th>DAZIDE 85 WSG (ppm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very High</td>
<td>1500</td>
<td>5000</td>
</tr>
<tr>
<td>High</td>
<td>1500</td>
<td>2500</td>
</tr>
<tr>
<td>Medium</td>
<td>1250</td>
<td>1250</td>
</tr>
<tr>
<td>Low</td>
<td>1000</td>
<td>800</td>
</tr>
</tbody>
</table>
Seed Geranium – Canopy Height
NCSU; 2007
Seed Geranium – NCSU; 2007

Citadel

0  500  1000  1500

Cycocel
Zonal Geranium ‘Rocky Mountain Royal Red’

Plant Height (cm)

Rates (ppm)
- Control
- 500 + 2500
- 1000 + 2500
- 1500 + 2500

Citadel + Dazide

Cycocel + B-Nine

North Carolina State University; 2006
Geranium ‘Florence Violet’
Chlormequat Sprays

Plant Height (cm)

Citadel

Cycocel

0 ppm
1000 ppm
1500 ppm

Michigan State University; 2007
Geranium ‘Florever Violet’

<table>
<thead>
<tr>
<th></th>
<th>1000 ppm</th>
<th></th>
<th>1500 ppm</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Citadel</td>
<td>Cycocel</td>
<td>Citadel</td>
</tr>
<tr>
<td>2 wks after application</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 wks after application</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Michigan State University; Spring 2007
Salvia farinacea ‘Blue Bedder’

1000 ppm

<table>
<thead>
<tr>
<th>Citadel</th>
<th>Cycocel</th>
</tr>
</thead>
</table>

1500 ppm

| Citadel | Cycocel |

2 wks after application

Michigan State University; Spring 2007
**Celosia plumosa** ‘Fresh Look Red’ - MSU; 2007

<table>
<thead>
<tr>
<th></th>
<th>1000 ppm</th>
<th></th>
<th>1500 ppm</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Citadel</td>
<td>Cycocel</td>
<td>Citadel</td>
<td>Cycocel</td>
</tr>
<tr>
<td>2 wks after application</td>
<td>Height suppression at 2 weeks (%)</td>
<td>Height suppression at 4 weeks (%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1000 ppm</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Citadel</td>
<td>34</td>
<td>39</td>
<td>42</td>
<td>30</td>
</tr>
<tr>
<td>Cycocel</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1000 ppm</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Citadel</td>
<td>35</td>
<td>27</td>
<td>41</td>
<td>40</td>
</tr>
<tr>
<td>Cycocel</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Treatment Combination</td>
<td>Height Suppression at 2 Weeks (%)</td>
<td>Height Suppression at 4 Weeks (%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>------------------------</td>
<td>----------------------------------</td>
<td>----------------------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2500 ppm Dazide + 1500 ppm Citadel</td>
<td>48</td>
<td>23</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2500 ppm B-Nine + 1500 ppm Cycocel</td>
<td>51</td>
<td>27</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5000 ppm Dazide + 1000 ppm Citadel</td>
<td>61</td>
<td>21</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5000 ppm B-Nine + 1000 ppm Cycocel</td>
<td>28</td>
<td>20</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Verbena ‘Obsession Lilac New’ – MSU; 2007*
Non-Stop Begonia ‘Yellow’
Chlormequat Sprays

Plant Height (cm)

University of New Hampshire; 2008
University of New Hampshire; 2008

Begonia: Untreated, Citadel 750, 1125, and 1500 ppm
Salvia ‘Picante Red’

Plant Height (cm)

Rates (ppm)

- Citadel + Dazide
- Cycocel + B-Nine

0
1000/2500
1500/2500

Dr. James Gibson, UFL; 2007
Salvia Efficacy – Untreated, Cycocel 500 ppm, Citadel 500 ppm
University of Florida – WFREC
Spring; 2006

Vinca Efficacy – Untreated, Cycocel 1500 ppm, Citadel 1500 ppm
Dianthus ‘Bouquet Purple’
Chlormequat Sprays

Plant Height (cm)

Citadel

Cycocel

Purdue University; 2008
Dianthus ‘Bouquet Purple’

Purdue University; 2008
Citadel vs. Cycocel
University Trial Conclusions

“Both PGR tank-mixes (Dazide + Citadel and B-Nine + Cycocel) had similar control as the concentration increased. Therefore it could be stated that they both have similar efficacies.”

Dr. Brian Whipker; North Carolina State University, 2006

“Citadel and Cycocel treatments were similar amongst concentrations and smaller than the untreated control.”

Dr. James Gibson; University of Florida, 2006

“In all species tested, there were no statistical differences in growth retardation between chemicals with the same active ingredient (e.g., Dazide vs. B-Nine or Citadel vs. Cycocel).”

Dr. Erik Runkle; Michigan State University, 2007

“Our results indicate that a single foliar application of either Citadel or Cycocel of 1000 or 1500 ppm was effective at reducing stem elongation in Pelargonium, Osteospermum, Dianthus and Tagetes.”

Dr. Roberto Lopez; Purdue University, 2008