



# GLUCONATES IN AGRICULTURE

**Sodium Gluconate** and **Gluconic Acid** are used extensively in the Agriculture Industry to improve crop yields. Recent studies have shown a marked improvement in several crops. These include:

- Corn
- Blueberries
- Tomatoes
- Soybeans
- Apples
- Cucumbers
- Potatoes

In the trials conducted, crops were planted with different combinations. These include

Standard

Common Fertilizer      Typically 6-24-6

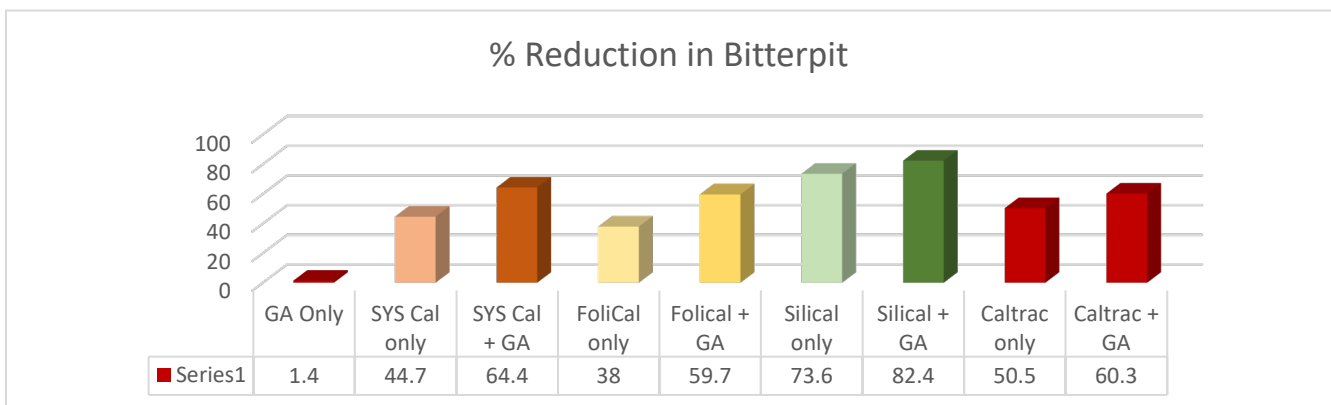
Gluconic Acid              Ranging from 0.5 – 2 gallons/acre

Calcium Supplement      Typically 1 gallon/acre

These addition were made in-furrow and foliar and in multiple applications as warranted.

## APPLES

One of the key attributes for apples is to reduce the amount of bitterpit. Study showed that by using gluconic acid with a calcium supplement, bitterpit could be reduced significantly beyond using GA or calcium alone or nothing.



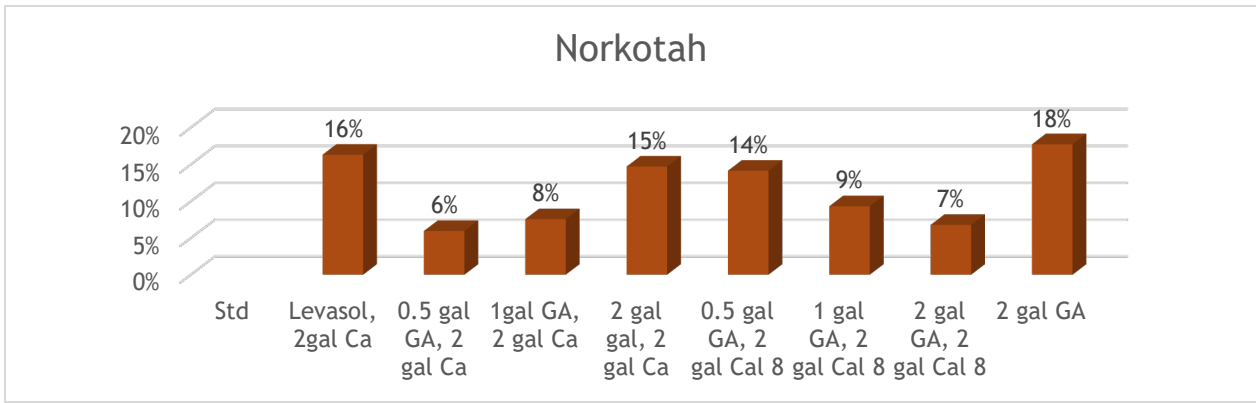
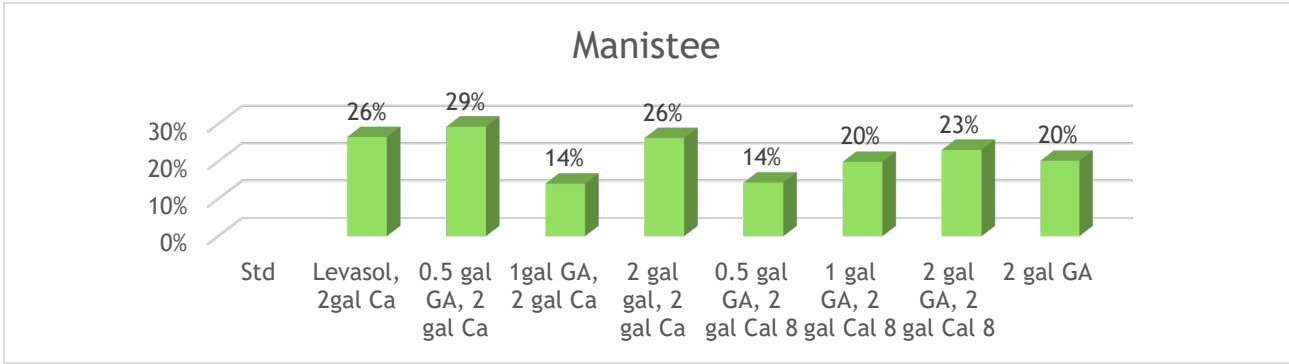


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## POTATOES

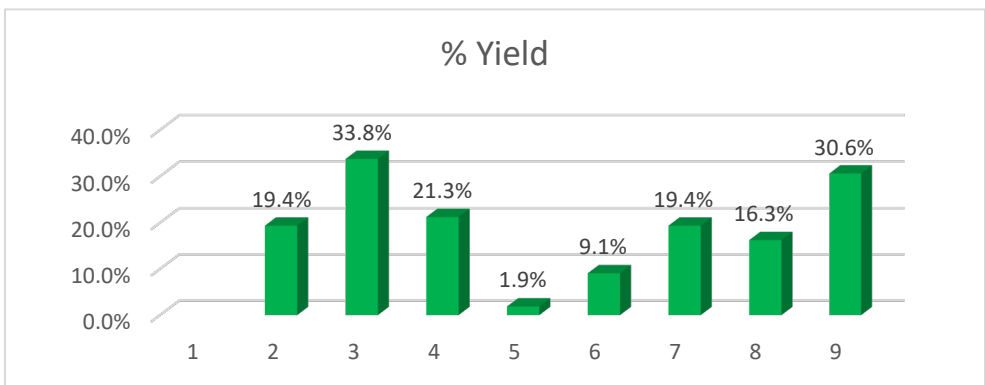


Gluconic acid was used in trials on two varieties – Manistee and Norkotah. The addition of gluconic acid increased yield by several percent versus calcium alone



## Cucumbers

Cucumbers showed similar improvements





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## Blueberries, Corn and Soybeans



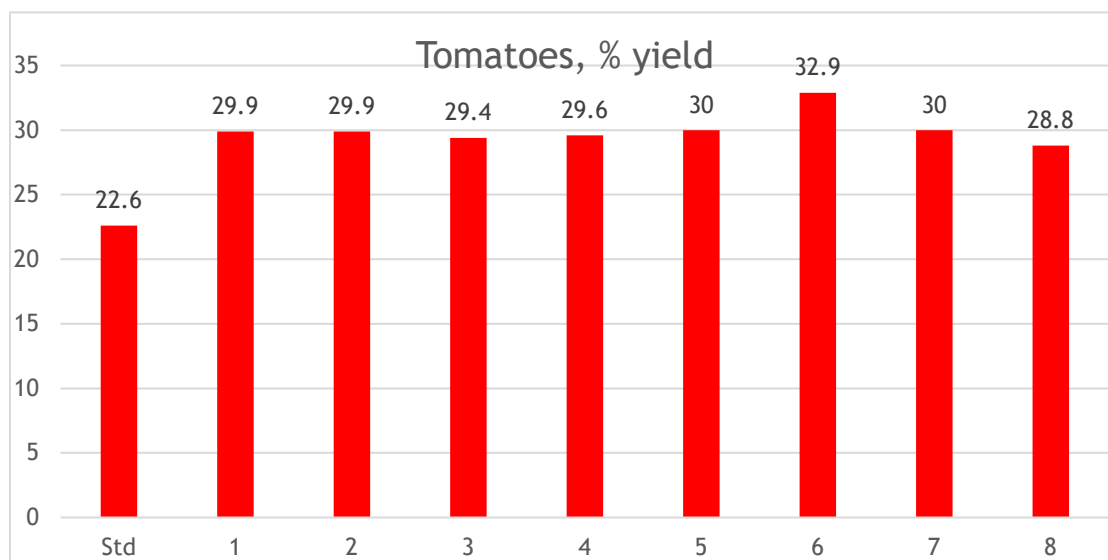
Corn showed an average of 10-15 bushels/acre increase in yield.

Similar results were found for blueberries, with a 2-3 bushel/acre increase for soybeans.

## Tomatoes



The most spectacular results were obtained for tomatoes which showed 7% or more increase in yield.





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## Summary

- |               |   |
|---------------|---|
| ▶ Apples      | ▶ 10-20% increase in Yield as lbs/acre      |
| ▶ Blueberries | ▶ 40-60% increase in Yield as lbs/ 2 bushes |
| ▶ Cucumbers   | ▶ 50-67% increase in Yield per cwt          |
| ▶ Potatoes    | ▶ 10-20% increase in Tubers/plant           |
| ▶ Corn        | ▶ 3-4% increase in Yield as bushels/acre    |
| ▶ Soybeans    | ▶ 2-3% increase in Yield as bushels/acre    |

In addition, the vigor of the plants and fruits/vegetables was maintained with no harm or negative effects.

## Availability

Sodium gluconate is available in solid or liquid form. Sodium Gluconate FCC comes in both granular and powder form. LG 60 (LT), LG 70, Gluconic Acid 50% and S-45/50 are available in drums, totes, bulk or rail.

Additional information about the studies that were done is available upon request. Thanks to Dr. Patrick McGinnity for his assistance in putting these studies together.

PMP Fermentation Products

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