Breaking Physiological Dormancy in Tubers of *Solanumchacoense.*

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Introduction

Solanum chacoense is a wild species relative of the common potato (*S. tuberosum*) native to Argentina, Bolivia, and Paraguay, which has become a source of genetic material for breeding for superior root biomass and higher N use efficiency. Little research has been conducted on *S. chacoense* for breaking physiological dormancy in tubers. Inability to readily break dormancy in *S. chacoense* tubers may result in uneven emergence contributing to experimental error.

Objective

Determine an appropriate concentration of GA_3 and soak time combination to encourage sprout formation with minimal elongation

Methods

Three separate size tubers (small, medium, and large) of 11 *Solanum chacoense* genotypes were treated with four concentrations of GA_3 (0, 50, 100, and 150 µg/ml) for three separate soak periods (5, 45, and 90 min). Tubers were kept in an environmentally controlled incubator at 25 ºC under fluorescent lights for 24 h/day for 46 days

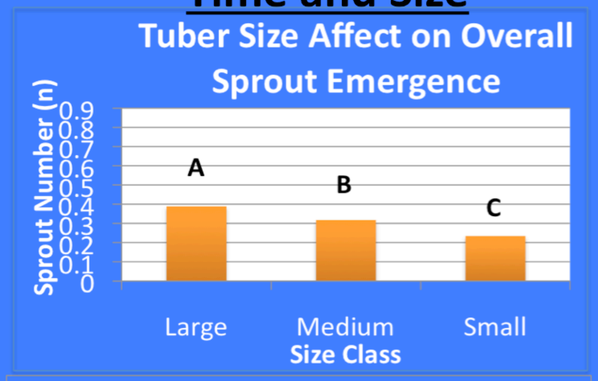
Current Practice

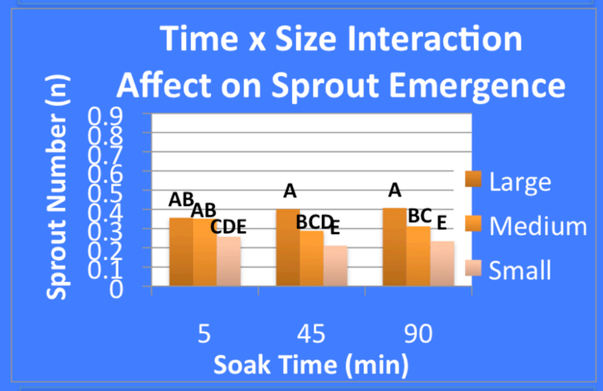
Rindite: Ethylene chlorohydrine (7 part), 1,2-dicloroethane (3 part), and carbon tetrachloride (1 part)
Issues: Response to chemical treatment varies between genotypes varies and when three components of rindite are mixed together, they produce a poisonous vapor, which if inhaled, could result in fatality

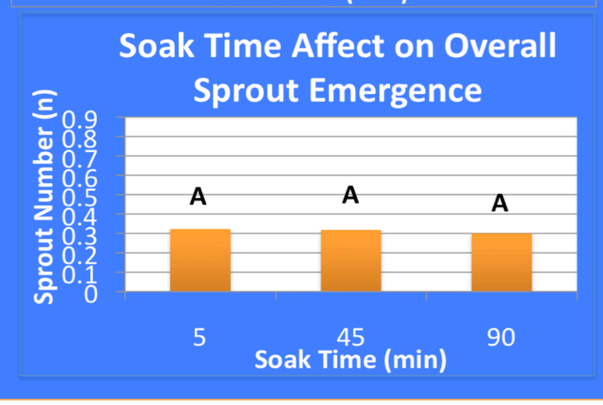
Significant Interactions

Source	DF	F Value	Pr>F
GA3	3	12.37	<0.0001
Time	2	0.45	0.6393
GA3*Time	6	1.81	0.0958
Genotype	10	5.87	<0.0001
GA3*Gen	30	2.26	0.0003
Time*Gen	20	0.44	0.9836
Size	2	72.21	<0.0001
GA3*Size	6	13.52	<0.0001
Time*Size	4	11.5	<0.0001
Gen*Size	20	16.77	<0.0001

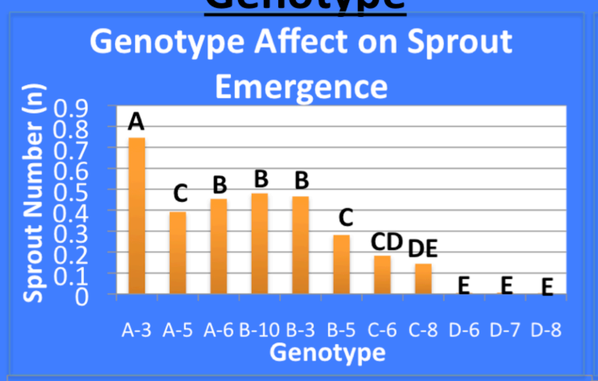
Time and Size

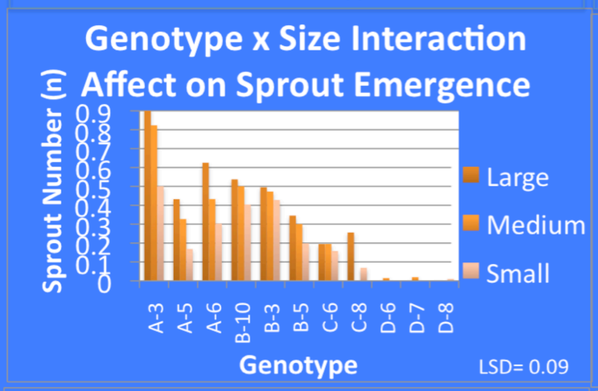


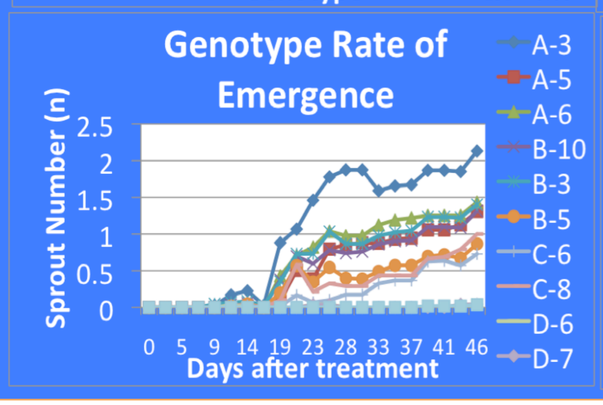




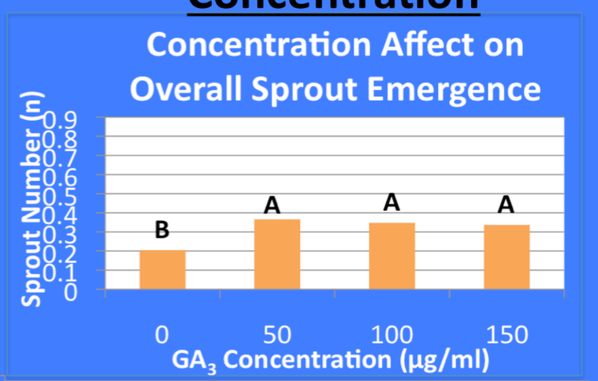
Genotype

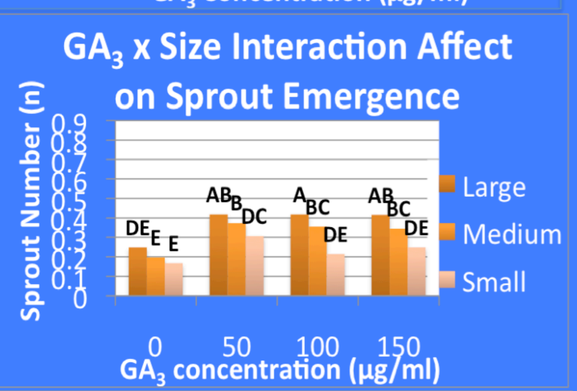


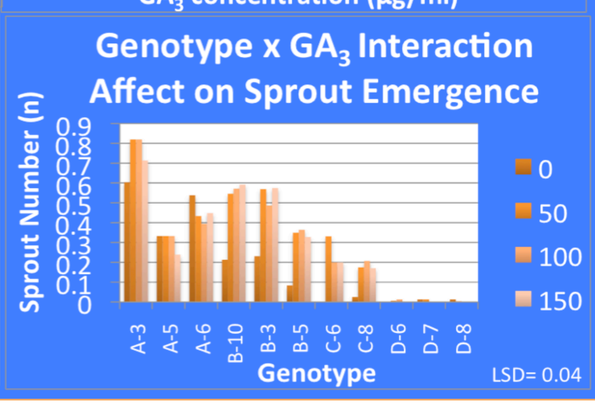




Concentration







Conclusions

- Direct correlation between tuber size and sprout emergence
- Genotypes showed large variation in overall sprout emergence with D-6, D-7, and D-8 exhibited the strongest dormancy
- GA3 concentrations greater than 0 µg/ml induced sprout emergence
- No single treatment combination induced sprout emergence across all genotypes
- Soak time had no affect on sprout emergence

Acknowledgments

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