

**University of Minnesota
SOUTHERN RESEARCH AND OUTREACH CENTER**

2003 Horticulture Research Project List

Vincent A. Fritz, Horticulturist

I. SWEET CORN

A. Weed Management Strategies in Processing Sweet Corn – Roger Becker and Vince Fritz

This study is being conducted in an effort to evaluate the most recent plant protectant strategies for both grass and broadleaf weed control in processing sweet corn production.

B. Seed Treatments for Improved Stand Establishment and Disease Control in Sweet Corn –Vince Fritz

This is a continuing collaborative effort coordinated through the NE-124 project “Genetic Manipulation of Sweet Corn Quality and Stress Resistance”. The study focuses on the evaluation of several seed treatments in two sweet corn cultivars. Waseca served as one of the twenty-one locations in the U.S. Of particular interest, is the combined seed treatments containing insecticides to reduce the risk of Stewart’s wilt, which is transmitted by flea beetles.

C. Differential Crop Canopy Density in Processing Sweet Corn Varieties – Roger Becker and Vince Fritz

Sixteen common processing sweet corn cultivars are being assessed for relative crop canopy density. These assessments will subsequently be used for improving weed management strategies that are more specific to the biomass production and leaf architecture of a particular cultivar. This information will then be integrated into a WEB information database that is to be used by processors throughout the Midwest region.

D. Impact of Gamma Aminobutyric Acid (AuxiGro[®]) on Sweet Corn Maturity and Yield – Vince Fritz

This study is being conducted to determine if timely applications of GABA will improve processing sweet corn yields, particularly by increasing kernel depth. This would translate into an increase in “cut corn recovery” and potentially improve the economics of growing sweet corn for processing.

II. PEAS

A. Processing Pea Performance Trial - Vince Fritz

Over fifty processing pea varieties will be evaluated for relative vigor, uniformity, and yield. Main purpose of the study is to provide an objective field test site for both established and new varieties to aid commercial vegetable processors in making variety selection decisions.

B. Use of Oat Extracts in an Acrylic Polymer as a Seed Treatment for Root Rot Control – Vince Fritz and Jerry Johnson

Early investigations conducted in growth chambers have shown that an oat extract applied to pea seeds have an inhibitory effect on root rot infection. Studies are being expanded to include field investigations and, in addition, the use of an acrylic polymer is being used as a carrier of the oat extract for improved coverage on the seed.

C. Weed Management Strategies in Processing Peas – Roger Becker and Vince Fritz

This study is being conducted in an effort to evaluate the most recent strategies for both grass and broadleaf weed control in processing sweet corn production.

D. Germplasm Screening for Aphanomyces Resistance – Vince Fritz

Advanced germplasm lines from pea seed companies will be evaluated for relative root rot resistance in the disease nursery. The nursery has had a long history of significant Aphanomyces pressure and serves as a major site in the nation for disease resistance screening.

E. Oat and Rye Precrop Effects on Aphanomyces Root Rot in Peas – Vince Fritz

Newer oat varieties and rye are being evaluated for root rot suppression in the disease nursery. After precrop chisel plow down, a susceptible pea cultivar was planted. The impact on pea growth and yield will be recorded.

III. CABBAGE

A. Impact of Colored Plastic Mulches on Cabbage and Chinese Cabbage Production and Nutraceutical Content – Vince Fritz and Steve Hecht

Cabbage and Chinese cabbage production will be evaluated under six different plastic mulch treatments (no mulch, black, green, red, blue, and yellow) grown on raised beds under trickle irrigation. The main purpose of this study is to determine if gluconasturtiin (PEITC precursor) and glucobrassicin (I3C precursor) production is affected by differences in the ratio of red to far red light and blue light reflected by the colored mulches. Parameters to be measured include yield, time to harvest, soil rhizosphere temperature, light quality reflection from the mulch, gluconasturtiin and glucobrassicin content.

B. Effect of Biotic and Abiotic Stress Treatments on the Level of Glucosinolates in Two Chinese Cabbage Cultivars – Fernando DeVillena and Vince Fritz

Gluconasturtiin, a naturally produced compound in Chinese cabbage, is a precursor to phenethyl isothiocyanate (PEITC), which has been identified as having significant chemopreventive properties in humans. This study was initiated to investigate the potential to manage effectively, the levels of gluconasturtiin produced in Chinese cabbage by imposing biotic and abiotic stress. It is suspected that stressed plants will produce a higher level of gluconasturtiin and, as a result, offer greater chemopreventive activity to the consumer.

C. Optimizing Zone of Influence from Colored Plastic Mulch for Improved Reflective Benefit and Impact on Glucosinolates in Cabbage – Vince Fritz

To better determine if glucosinolate production is at least partially mediated by the phytochrome system in plants, cabbage glucosinolate concentrations will be measured from plants grown under various widths of different colored plastic mulch. It is anticipated that, as the surface area of the colored mulch is expanded around the plant, greater light reflective effects will result.

E. Identifying Chinese Cabbage Cultivars with High Resistance to Bacterial Soft Rot – Vince Fritz

Chinese cabbage has been identified as one of the major cruciferous vegetables that are comparatively high in glucosinolate concentration. One of the most significant barriers to summer production in the Midwest has been a destructive bacterial soft rot disease caused by *Erwinia carotovora*. This project is focused on identifying cultivars that exhibit resistance to soft rot to be used in future studies.

IV. Indian Corn

A. Cultivar Evaluation – Vince Fritz

Several varieties will be evaluated for maturity, ear fill, ear length, and color.

V. Turnips

A. Impact of Growing Turnips in Colored Plastic Mulch on Glucosinolate Content – Vince Fritz

Turnips will be planted in late summer on different colored plastic mulches to determine if there is any differential partitioning of glucosinolates in the roots and shoots. Turnips are a particularly interesting crop since both portions (roots and shoots) of the plant are consumed and are harvested at both early and late stages of growth.

VI. Other

A. NC-7 Regional Ornamental Plant Trials - Mark Widrlechner, Jim Hebel, Harold Pellet, and Vince Fritz

This continuous study was established to observe plant material from different parts of the world for adaptability to southern Minnesota. This study was initiated in 1959.

B. Chrysanthemum Performance Trial - Neil Anderson, Jim Hebel, and Vince Fritz

The purpose of this study is to compare the performance of several commercial hybrids and breeding lines of chrysanthemum in southern Minnesota.