University of California Cooperative Extension

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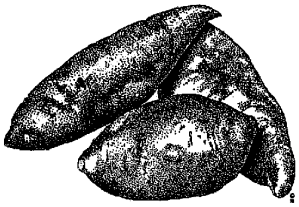


SWEETPOTATO TIPS

In this issue:

Meeting Notice

April 22, 2009

SWEETPOTATO FIELD MEETING:

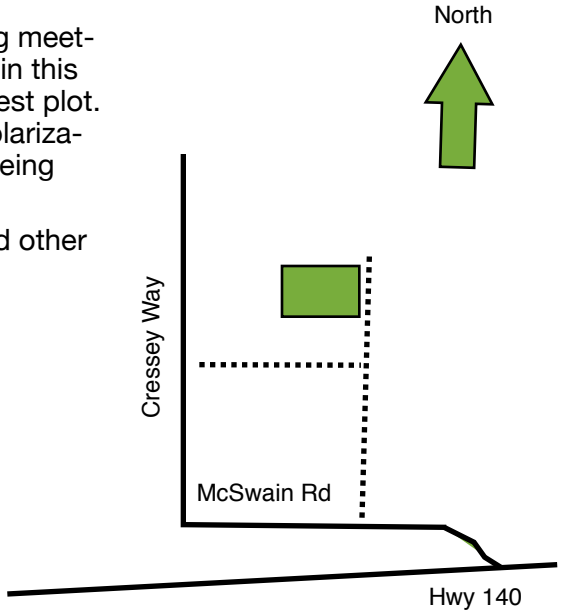
HOTBED FUMIGATION ALTERNATIVES

Thursday, May 7, 2009
9:00 am - 10:30 am
D&S Farms hotbeds
NE corner of McSwain Rd and Cressey Way

Special Guests: Dr. Mike Davis, UC Davis, and Dr. Jim Stapleton, UC Kearney Ag Center

- Please join me for this brief morning meeting to view the different treatments in this USDA ARS sponsored fumigation test plot. Chemical fumigation treatments, solarization, herbicide and fungicides are being evaluated.
- Telone update (cap, production) and other fumigation test plots discussion.
- Coffee and doughnuts!

Scott Stoddard, Farm Advisor



COOPERATIVE EXTENSION WORK IN AGRICULTURE, HOME ECONOMICS, AND 4-H, U.S. DEPARTMENT OF AGRICULTURE, UNIVERSITY OF CALIFORNIA, AND COUNTY OF MERCED COOPERATING.

2008 Research Summary

Sweetpotato Storage Trials: Variety Differences, Storage Conditions, And Fertilizer Effects.

C. Scott Stoddard, UCCE Merced and Mikal Saltveit, Dept of Plant Sciences, UC Davis

Food processors use California sweetpotatoes (*Ipomoea batatas*) to produce sweetpotato fries. Unfortunately, by February, raw product quality often deteriorates during long-term storage conditions typical for the area. Sugar accumulation in storage is problematic for processing because it creates darker colors and changes in texture, both undesirable in the finished product. Therefore, a multi-tiered project was conducted in 2007-08 to observe the effect of varieties, in-season N and K management, and storage conditions (temperature, relative humidity, and CO_2) on storage loss and sugar levels in orange-flesh sweetpotatoes. Significant (LSD $p < 0.05$) differences were found between the varieties tested in their cumulative long-term (180 days) weight loss in storage. Covington and Beauregard had the least amount of loss, at 8.2 and 8.4%, whereas Evangeline and Diane were highest, at 13 and 13.5%. Nitrogen and potassium source did not significantly affect yield or storage weight loss, but early applications of nitrogen tended to improve yields and significantly ($p \leq 0.1$) reduced cumulative weight loss after February as compared to applying nitrogen throughout the season. Long-term weight loss in controlled storage conditions was least (6%) when Beauregard roots were stored at 90% relative humidity; combining slight chilling stress (54° F) and low relative humidity (70%) produced more weight loss than either alone (12%). Elevated CO_2 (3%) reduced weight loss and glucose accumulation in roots stored at 54° F. Preliminary results suggest that improvements can be made in long-term root storage quality through variety selection, fertilizer management, and increased relative humidity in storage.

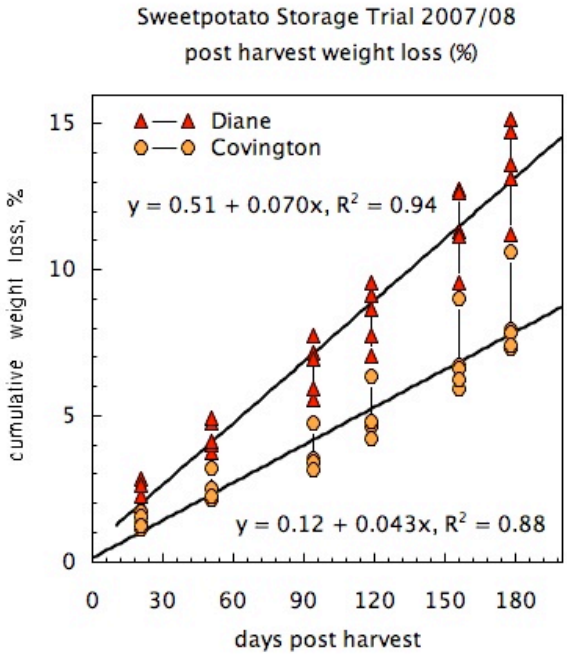


Figure 2. Weight loss in storage was significantly less for Covington (bottom line) compared to Diane (top line).

Methyl Bromide fumigation alternatives for sweetpotato hotbeds in California.

Scott Stoddard, UCCE Merced County; Mike Davis, UC Davis Plant Pathology; Antoon Ploeg, UC Riverside Nematology; Anil Shestha, KAC Weed Ecology; Jim Stapleton, KAC Plant Patholgy.

Because of their importance and cost, the area for hotbeds is usually fumigated so that production is maximized and potential disease problems minimized. Methyl bromide is the current choice for most producers, but for environmental and regulatory reasons, this chemical is being phased out and will soon be unavailable for use. This project began in July, 2007, to evaluate alternatives to methyl bromide fumigation in sweetpotato hotbeds. The trial was located in a commercial hotbed operation near Atwater, CA, and consisted of six fumigation treatments; main plots were split into different fungicide and herbicide treatments. No Root-knot nematodes (*Meloidogyne incognita* and *M. javanica*) were found in any of the treatments at any sampling date. Additionally, no significant differences were found between treatments for the root rotting fungal pathogen, *Pythium.* Weeds were the main pest problem encountered in the first year of this study. The methyl bromide + Pic and the Telone (1,3-D) + Pic plots had significantly fewer weeds than the other treatments. Weed control was improved for the other fumigants, including solarization, when supplemented with the use of herbicides or hand weeding. Valor gave better weed control than Devrinol, however, some phytotoxicity on the sweetpotato plants was observed in the Valor treated plots. However, the final biomass of the plants was not significantly affected ($p = 0.05$) compared to the other treatments. Significant differences were found between fumigation treatments on plant production, with the greatest number of plants in the untreated beds (220 plants per 4 ft^2) and the least in the solarized beds (110 plants/4 ft^2). However, the untreated beds had smaller seed as compared to the other treatments, and so these

results really reflect the impact of seed-root size on transplant production, not fumigation.

Based on the first year of this study, weeds are the main pest problem that is controlled with fumigation in sweetpotato hotbeds. Several of the fumigation alternatives evaluated in this trial show promise as a workable replacement for MeBr, especially when combined with chemical herbicides. Refinements need to be made to the rates for both the Vapam + Telone and the Valor treatments to minimize crop phytotoxicity. Regulatory hurdles with the use of Telone remain.

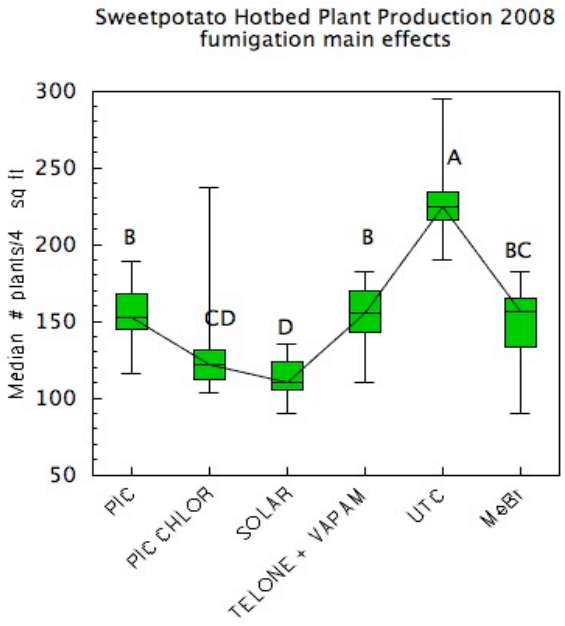


Figure 3. Fumigation main effects on sweetpotato plant production in the hotbed, # plants per 4 sq ft. Untreated (UTC) used smaller seed size, which resulted in higher plant counts.

National Sweetpotato Collaborators Group Variety Trial.

Scott Stoddard, UCCE Merced, Deborah Golino, UC Davis Foundation Plant Services, Don LaBonte, LSU, Craig Yench, NCSU

The Collaborators Trial is so named because it is a long-term variety evaluation trial (> 40 years) that is a collaborative effort between breeders in North Carolina and Louisiana and multiple AES/Extension personnel in other states where this crop is grown. The objective of the trial is to evaluate new breeding lines of sweetpotatoes for their quality, yield, and storage characteristics for California conditions. It is conducted in a commercial field and require grower cooperation. Statistical design is a randomized block with four replications.

The Collaborators trail in 2008 was with Blain Yagi, near Livingsont, CA. Soil type was Hilmar sand, slightly saline-alkali. The field was fumigated with Telone and pre-irrigated. Warm, dry, and windy spring. No significant pest problems, except Golden Sweet had poor stand due to losses from stem rot. Best total yields were obtained with the new cultivar NC 99-573, but this was mainly due to the production of long, jumbo sized roots. Very promising is L-04-175, a red skinned line from Louisiana with very good shape and color and good yield.

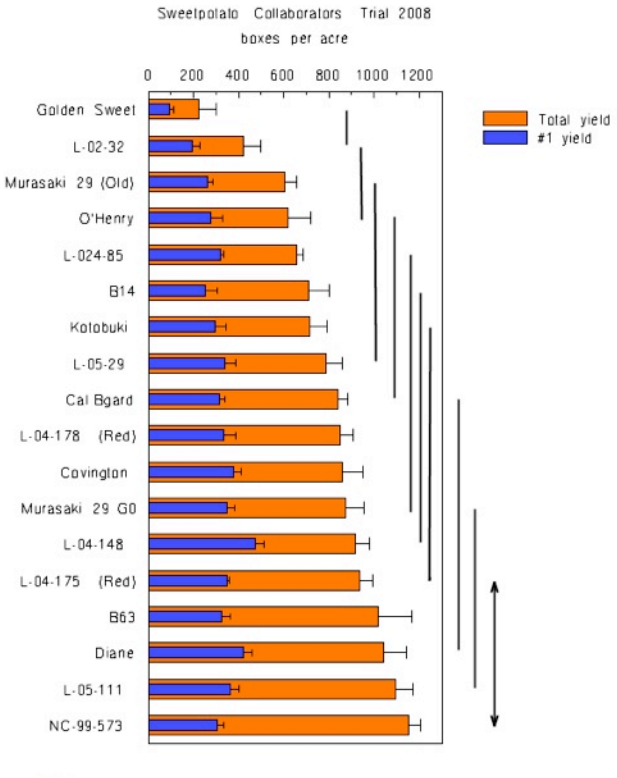


Figure 4. Collaborators Trial yield results, 2008. Orange bar is total marketable, blue shows that portion which are #1 size category.

Murasaki-29 Sweetpotato Virus-Tested Seed Trial

Scott Stoddard, UCCE Merced, Deborah Golino, UC Davis Foundation Plant Services, Don LaBonte, LSU.

Over the past five years, Murasaki-29 has produced average yields with few jumbo roots and very high proportion (about 45%) of mediums. The lack of jumbo roots suggests that this variety needs a longer growing period, but research at NCSU has shown that the Sweetpotato Feathery Mottle Virus complex (SPFMV) can also reduce the size and yield potential in just a few years with susceptible cultivars. This variety originated in 2001 as a seed-

ling from and open-pollinated polycross nursery of the previous year, making the roots used for seed in 2007 seven years old. The purpose of this trial was to compare the effect of "old" seed (G8) to virus-tested plants (G0) on Murasaki-29 sweetpotato yield and quality. In 2008, Murasaki-29 was grown using seed first grown in 2004, and compared to virus-tested greenhouse plants grown by Foundation Plant Services at UC Davis from a mother plant sent from LSU in four locations. Averaged across all locations, total marketable yields (TMY, or the sum of #1's, mediums, and jumbos) were significantly greater ($p = 0.03$) for G0 seed as compared to G8 seed. This represents nearly 33% increase in yield, which suggests that this variety is susceptible to the SPFMV complex. The yield increase could be directly attributed to a significant increase in the number of jumbo roots, which were doubled with the G0 seed. Harvested root quality was excellent in ll locations, even with older seed.

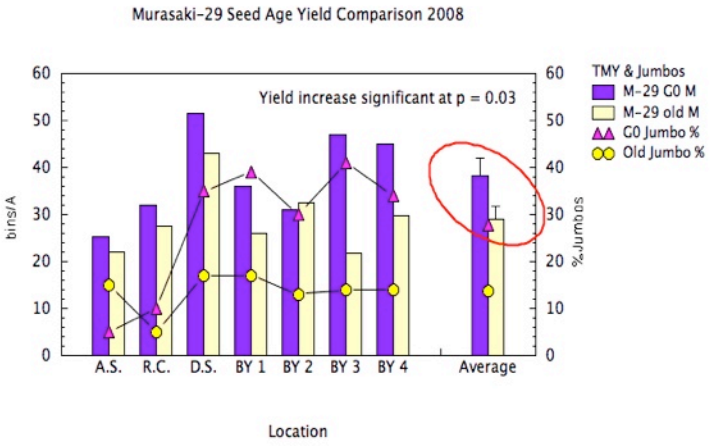


Figure 5. Murasaki-29 trial yield results, 2008, in total marketable bins per acre, and % jumbo sized roots. Violet bars represent nge, G0 seed, pale bars for old seed.

Beauregard Clone Evaluation Trial

Scott Stoddard, UCCE Merced; Deborah Golino, UC Davis Foundation Plant Services, The Sweet Potato Council of California

Used since 2000, the California Beauregard maintained by Foundation Seed Services at UC Davis has a "twining" characteristic, with slender vines that tend to grow upright and twist and twine around each other. This is particularly troublesome in the greenhouse and with new cuttings, and therefore the Sweetpotato Council requested a new hill selection. This began in 2004, and in 2007 a trial in one field was conducted to compare two new selections called B03 and B04. Results from that trial showed that either clone produced a higher #1 pack-out than the current California Beauregard, and did not have the twining characteristic. In 2008, additional tests were conducted between B03 and B04 in several locations. On average, there was no significant difference between the clones for yield, size, or culls. Total marketable yield was very good, and no twining was observed. Either clone showed comparable storage characteristics, but based on input from 6 growers, clone B04 was judged to have slightly better aesthetic appeal. Either choice would be acceptable for the sweetpotato industry in California.

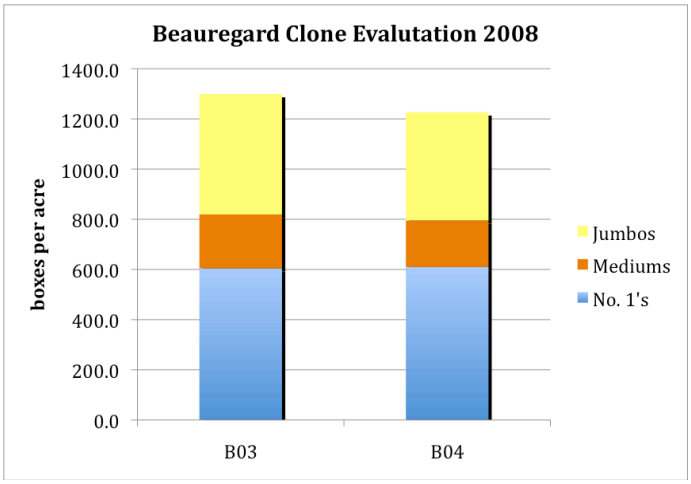


Figure 6. 2008 yield results between Beauregard sweetpotato clones B03 and B04. There was no significant difference in total yield or size. B04 has slightly better appearance, and was chosen by the Sweet Potato Council to be the next California Beauregard.

Morning glory leafminer control in sweetpotatoes.

Morningglory leafminer (Bedallia spp) in sweetpotatoes. Variety was Diane, with a late October harvest date. Program consisted of a different timings (July, August, and/or Sept) and number of applications (1 or 2) of two different insecticides: Rimon (novaluron) and Success (spinosad).

Plots were sprayed by hand using a CO2 backpack sprayer, beginning prior to the crop being infested with the leafminer. Plots were evaluated in October by randomly selecting 10 leaves within each plot and scoring the leaf on presence/absence of live larvae. Significant differences were found on leafminer control between treatments. Best overall control occurred when insecticide treatments were applied in both August and September. With these application times, only 15 – 25% of the leaves had live larvae, as compared to 95% for the untreated control. Once only sprays in late July or mid August were not significantly different than the untreated plots. A single application in September of either Rimon or Success reduced the number of live larve by about half. Both insecticides in this trial worked equally well. Morningglory leafminer is not usually a bothersome pest in sweetpotatoes, as it tends to infest the vines too late in the season to cause any impact on crop vigor. However, in situations where an infestation begins early in a late-planted field, control measures may be beneficial. Late August to early September is the critical time to make an insecticide application of Rimon or Success for best control.

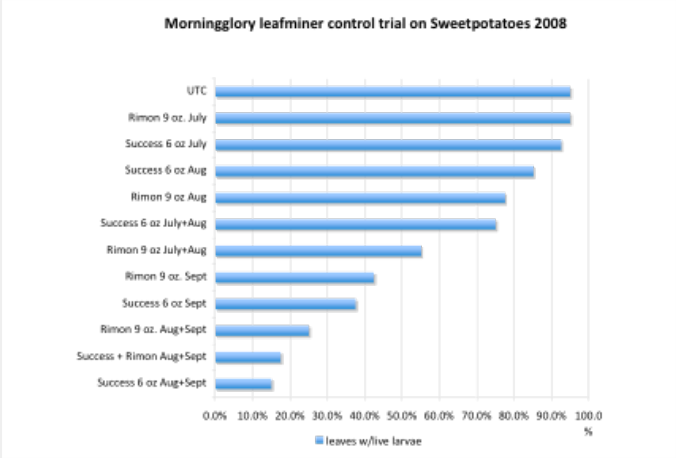


Figure 7. Percentage of leaves with Live morningglory leafminer counts as affected by insecticide treatment.

Updates:

Chateau (flumioxazin) herbicide has received California registration in sweetpotatoes. Product is labeled for pre-plant use only, up to 2.5 oz per acre. This is a very effective herbicide that controls a broad range of broadleaf weeds and some grasses that other states have been able to use for a number of years. Unfortunately, it requires water incorporation to be effective, so unless you're lucky enough to have at least a ¼" rain following application, sprinklers are required. Additionally, be very careful with this herbicide, as it can cause crop phytotoxicity and stunting at rates as low as 2 oz per acre (plants should eventually recover). Best fit for California right now would be in the hotbeds at no more than 1.5 oz per acre, applied just before first irrigation (0.11 oz per 400 linear ft of hot bed. This is only about 3 grams of material — you will need a very accurate scale).

Winter Meeting Survey Results:

- Acreage should be about the same this year as last.
- Hawaii was preferred to Monterey by a wide margin as a location for the next California hosted convention.
- Variety breakdown is 47% yams, 19% reds, 18% sweets, 16% Japanese.

Murasaki-29 tips:

This is the big year for Murasaki-29, as this season it will be grown for the first time on significant acreage in the county by numerous growers. Remember that this variety requires a long season (140 days) to fully size, so plan to plant it early and harvest late. It stores well and should not compete with early Kotobuki sales. It is moderately resistant to nematodes and so it may have a better fit in the buffer zones. It has some tolerance to russet crack, but yields are improved with new seed. Unless things change a lot this season, you should plan to change out 25% of your old seed every year (4 year rotation, where you have G1 - G4 seed stock).

Scott Stoddard

Farm Advisor, Merced and Madera Counties