RESEARCH AND INDUSTRY NEWS

Nitrogen and Plastic Mulch on Greenhouse Lettuce

In a countless number of experiments vegetables fail to respond to nitrogen treatment when soil nutrient levels before planting are already sufficient to meet the crop's requirement. In fact, according to Arnold Bloom at UC Davis, the higher levels of nitrogen in many experiments are probable deleterious to plant growth, instead of yield-promoting. Although yields tended to increase with plastic mulch and nitrogen treatment in a recent experiment in the Mediterranean (30°N), results were not significant. Yields ranged from 1.3 lb/head for unmulched lettuce to 1.7 lb/head for clear plastic mulch plus 90 lb/acre of N (Table 1). Although yields were not affected by clear plastic mulch, it should be noted that both leaf nitrogen concentration, and soil nitrogen levels were greater in plastic mulch treatments compared to controls (Table 1).

Table 1. Cos lettuce cv. Paris Island leaf Nitrate content, soil nitrate content, and yield as affected by clear plastic mulch and N fertilizer in the greenhouse.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Unmulched</th>
<th>Unm. + N</th>
<th>Mulch</th>
<th>Mulch + N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leaf NO₃-N 45 DAP</td>
<td>3200</td>
<td>3975</td>
<td>2975</td>
<td>4100</td>
</tr>
<tr>
<td>Soil NO₃-N 4 in depth</td>
<td>41</td>
<td>233</td>
<td>106</td>
<td>231</td>
</tr>
<tr>
<td>Yield (lb/ head)</td>
<td>1.3</td>
<td>1.5</td>
<td>1.5</td>
<td>1.7</td>
</tr>
</tbody>
</table>


Final Nutrient Concentration for strawberry hydroponic production (ppm)

<table>
<thead>
<tr>
<th>Macronutrients</th>
<th>Micronutrients</th>
</tr>
</thead>
<tbody>
<tr>
<td>N=80-120</td>
<td>B=0.5</td>
</tr>
<tr>
<td>P=45</td>
<td>Mn=0.5</td>
</tr>
<tr>
<td>K=100-180</td>
<td>Zn=0.05</td>
</tr>
<tr>
<td>Mg=50</td>
<td>Cu=0.05</td>
</tr>
<tr>
<td>Ca=150</td>
<td>Mo=0.05</td>
</tr>
<tr>
<td></td>
<td>Fe=3</td>
</tr>
</tbody>
</table>

1Optimum growing media and respective yields were perlite 80% + peat 20% (248 gr/plant); and perlite 90% + peat 10% (237 gr/plant). (Lindardakis and Manios, Acta Hort 287,317 (1990)).

Food Service Factoids

◊ The typical supermarket sells 260 types of fruits and vegetables
◊ U.S. Food Service Industry 1992 sales = $262 billion.
Food Service Factoids, cont.
◊ Expected US 1992 sales at restaurants and
    lunchrooms= $83.2 billion
◊ Costa Rica's non-traditional exports grew from
    $50 million in 1985 to $220 million in 1990.

Integrated Management Program for
Sweetpotato whitefly and Melon
Thrips in Cucumber, Melon, Tomato,
Eggplant and Pepper
by Peter Bunn, Brewer Environmental Industries,
Inc., Honolulu
tel.532-7436 fax. 531-9078

Pest I.D.: Identify the whitefly on your crop to make
sure you are dealing with Bemibia, the sweetpotato
whitefly and not with the greenhouse whitefly,
Trialeurodes. The SPWF has been detected in all
vegetable production areas of Oahu, and in the
neighbor islands in Kula, Molokai, Kona, and
Kamuela.
1. One week before crop removal, apply
Gramaxone or Roundup (or both) to perimeter
weeds. Do not use a pre-emergent so that weeds
will return to provide a possible habitat for
beneficial insects.
2. Remove crop promptly and clear field of all
debris. Burn or bury rubbish and till soil.
Consider soil sterilization with metam sodium or
methyl bromide (except cucurbits) to control
weeds and insect pupae. Leave field fallow for two
weeks.
3. Control in-field weeds at planting with pre-
emergent herbicides like Prefar (except eggplant)
or Alanap (melon only). Use a reflective mulch in
the crop row to repel insect pests.
4. Distribute large boards painted yellow and blue
throughout the crop to monitor and trap pests. Use
a sticky oil or detergent that can be cleaned off and
reapplied to the board's surface. Situate additional
stations on the prevailing windward edge.
5. Use high pressure, "air assist" type sprayers to
ensure maximum coverage and contact with pests.
Drift retardants can be used to control small
droplets.
6. Spray seedlings with long residual and systemic
materials. Tank mix and alternate Guthion, Vydate,
Thiodan, Metasystox R (except tomato) and Pounce
with Incite. Follow and obey pre-harvest intervals
for each crop. Heavy selection pressure has
resulted in the SPWF developing partial resistance
to several chemicals. Growers have reported poor
results with methomyl, acephate, endosulfan,
diazinon, carbaryl, phosdrin, kinoprene, telstar,
oxamyl, and malathion.
7. Include Mpede or Sunspray Oil (except
eggplant) upon the appearance of nymphs and
pupae. These can be tank mixed together or with
other insecticides but should not be used in high
temperatures to avoid leaf injury. Time
applications to reduce impact on beneficial insects
(five parasitoids have already been identified in
Hawaii which attack the SPWF, but populations of
natural enemies are normally decimated with
unchecked insecticide applications). If possible
introduce biocontrol agents.
8. During crop harvest periods use Pyrellin,
Pyrenone Crop Spray as well as soap and oil.
Unlike the soaps and oils, pyrethrins work best in
high temperatures and won't usually cause
phytotoxicity. Use a cottonseed oil based spreader
to prevent ultraviolet degradation of pyrethrin
insecticides.
9. Include kelp based foliar fertilizers in the
spray program. Shurecrop is a good example of
such a compound. These materials increase plant
vigor and help the crop withstand insect pressure,
as well as increase yield potential.
10. Keep appraised of experimental materials and
their regulatory status. Promising products
include: Danitol (fenpropathrin)/Orthene
(acephate); Capture (bifenthrin); Margosan-O
(azadirachtin); Jojoba oil; Aliette (fosetyl-al);
NTN 33893; and, Avid (abemectin).

Vacationing? Visit a Farm in England!
While visiting with a sweet corn grower in the
beautiful Kula slopes, a sweet corn farmer from
Louisiana, who just happened to be driving by,
stopped after noticing familiar plantings in the
field, for a little "corn" talk. Why not? What
would be better in a vacation than to visit fellow
farmers across the globe? In fact, this type of
visits have been structured in England as part of
the tourist industry. For info on host farms in
England call: The British Travel Authority at
213-628-3525; or, obtain the book "Discover
Britain," from British Gifts at 800-882-7885.

Stats on organic farm numbers
<table>
<thead>
<tr>
<th>Region</th>
<th>No. organic farms</th>
<th>% of all farmers</th>
</tr>
</thead>
<tbody>
<tr>
<td>US</td>
<td>20-40,000</td>
<td>&lt;1%</td>
</tr>
<tr>
<td>California</td>
<td>1,300</td>
<td>--</td>
</tr>
<tr>
<td>West Germany</td>
<td>1,700</td>
<td>--</td>
</tr>
<tr>
<td>Great Britain</td>
<td>1,500</td>
<td>0.3%</td>
</tr>
<tr>
<td>New Zealand</td>
<td>116</td>
<td>0.2%</td>
</tr>
<tr>
<td>Australia</td>
<td>1,200</td>
<td>0.95%</td>
</tr>
</tbody>
</table>
Baby Corn Production
Some cultivars have been bred specifically for baby corn production. However, baby corn can also be obtained by early picking of regular sweet corn cultivars. Baby corn is picked 1 or 2 days after silks emerge. Earworm won't be a problem since harvest takes place before damage can occur. Baby corn developed cultivars include 'Baby', and 'Baby Asian.' Ears are normally 3 to 4 inches long.

Organic Mulch on Drip-irrigated Tomatoes
A study in Griffin, Georgia determined that organic straw mulch resulted in lower soil temperature, improved soil moisture, reduced bulk density and mechanical impedance, and increased infiltration rates, as compared to plastic mulch, in a drip irrigation system. These characteristics may result beneficial in hot-humid climates and in heavy soil situations. No yield differences were detected, wether the plants were drip irrigated daily or twice weekly. Yields in these experiments were greater with the organic straw mulch than with the black plastic mulch (Tindall et al., Agron J. 83,1028(1991)).

Mushroom Production in North America: Factoids
◊ Important producing states are California, Florida, Michigan, Pennsylvania.
◊ In 1990 Canada produced 115 million pounds, 75% going to fresh market.
◊ Per capita consumption in US is 3.8 lbs in the US and 5.4 lbs in Canada.
◊ Harvest cycles are now 21-24 days, compared to 30 days year ago.
◊ There are 460 mushroom growers in the US.
◊ 6 million pounds of specialty mushrooms are produced in the US, especially shiitake (67% of total volume), oyster, crimini, and enoki. (The Packer, Jan. 4, 1992).

Biological control for Sweet potato Weevil
The sweet potato weevil, Cylas formicarius is perhaps the most serious pest of sweet potatoes. Both larvae and adults feed on tubers in the ground. The weevil penetrates the roots through soil cracks, and thus pest incidence is greater during warm and dry climatic conditions. A fungus isolated in soils from Mt. Seven Stars, Taiwan, Beauveria bassiana, was found to result in up to 100% mortality of sweet potato weevil populations under natural conditions. Based on a regression equation which estimated B. bassiana potential and actual population densities, it was determined that adequate control of the weevil can be maintained under normal field conditions (Su et al., J. Invertebrate Path. 52:195(1988)).

Nitrogen fertilizer rates for Florida herbs

<table>
<thead>
<tr>
<th>Crop</th>
<th>N</th>
<th>K</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sweet marjoram</td>
<td>252</td>
<td>168</td>
</tr>
<tr>
<td>Rosemary</td>
<td>252</td>
<td>168</td>
</tr>
<tr>
<td>Winter savory</td>
<td>252</td>
<td>NA</td>
</tr>
<tr>
<td>Lavender</td>
<td>252</td>
<td>84</td>
</tr>
<tr>
<td>Basil</td>
<td>168</td>
<td>84</td>
</tr>
<tr>
<td>Sage</td>
<td>141</td>
<td>93</td>
</tr>
</tbody>
</table>

(S.H. Angell et al. ASA Agronomy Absts. 90&91).

Effect of bed width on yield of drip irrigated vegetables in Central Florida

<table>
<thead>
<tr>
<th>Vegetable</th>
<th>16 in bed</th>
<th>32 in bed</th>
<th>Marketable Yields (1000 lbs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cucumber</td>
<td>52</td>
<td>56</td>
<td>NS¹</td>
</tr>
<tr>
<td>Eggplant</td>
<td>17</td>
<td>19</td>
<td>NS</td>
</tr>
<tr>
<td>Pepper</td>
<td>19</td>
<td>24</td>
<td>NS</td>
</tr>
<tr>
<td>Squash, summer</td>
<td>14</td>
<td>17</td>
<td>**</td>
</tr>
</tbody>
</table>

1 NS, not significant, ** significant difference
2 No. of harvests C= 10; E=4; P=3; S=12.

Hort Department News
Dr. David Hensley has accepted the position of Extension Landscape Specialist with the Horticulture Dept. beginning 1 July 1992. Dr. Hensley worked as a Landscape Specialist at Kentucky State, and has been teaching and doing research for about 10 years at Kansas State University. His breath of experience, and interest
in undergraduate education should be welcomed both by the industry and also by local students pursuing careers in landscape horticulture.

RESOURCES

"Look through the 90s: The US fruit and vegetable industry," commentary and projections from 12 leading industry and research analysts. Send $10 to The Packer Circulation Dept., POB 2939, Shawnee Mission, KS 66201-9859.

Videotape: Calibration- a field approach. This program "takes the mystery" out of calibrating handguns, booms, and granular spreaders. 34 minutes, $15. Make checks payable to Univ. Florida. Order from IFAS Publications, IFAS Bldg. 664, Gainesville, FL 32611-0001.

UPCOMING EVENTS


89th Annual meeting of the American Society of Horticultural Science. Sheraton Waikiki, 2-7 August 1992. Hosted by Horticulture Dept., UHM. An opportunity to make national and international contacts, and to get updated with current research trends and technological developments. For registration contact: Travel Planners Inc., POB 32266 San Antonio, TX 78216, Tel. 800-531-7201.


The Third National Symposium for Stand Establishment in Horticultural Crops. Nov. 16-20, 1992 at Sheraton Harbor Place Hotel, Ft. Myers, Florida. Latest information on seed enhancements, coatings, moisture, seed priming and storage; transplant production; and, field establishment including direct seeding, gel seeding, soil amendments etc. Abstract deadlines= March 15, 1992. For Information contact: Office of Conferences, POB 110750, Gainesville, FL 32611-0750, Tel. 904-392-5930; FAX 904-392-9734.

XXIVth International Horticultural Congress, 21-27 Aug., 1994. Kyoto, Japan. All important aspects of production with the motto: "The beautification of life and it's environment through horticultural science." For information contact: Lab. of Hort. Sci., The Univ. of Tokyo, 1-1-1 Yayoi, Bunkyoku, Tokyo 113, Japan. Fax: (81)-3-5689-5750.

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Vegetable Crops Extension Specialist