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Prepared by Extension Vegetable Crops Specialists

D.N. Maynard
Chairman

G.A. Marlowe
Professor

M. Sherman
Assistant Professor

W.M. Stall
Associate Professor

J.M. Stephens
Assistant Professor

A. McDonald
VEA-I Multi-County

TO: VEGETABLE AND HORTICULTURE AGENTS
AND COUNTY EXTENSION DIRECTORS

FROM: W. M. Stall, Extension Vegetable Specialist

Vegetable Crops Department
1255 HS/PP Building
University of Florida
Gainesville, FL 32611
Phone: 904/392-2134

VEGETARIAN NEWSLETTER 82-5

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The use of trade names in this publication is solely for the purpose of providing information and does not necessarily constitute a recommendation of the product.
I. NOTES OF INTEREST

A. New Publications

1. Vegetable Field Day, ARC Research Report IMM 82-2, is available from the Immokalee ARC, Rt. 1, Box 2G, Immokalee, FL 33934.

2. Vegetable Field Day Report is available from the Belle Glade AREC, P. O. Drawer A, Belle Glade, FL 33430.

3. A Summary of Results from Water Research Projects Supported by the Southwest Florida Water Management District and Conducted at the AREC-Bradenton, ARC Dover and ARC Immokalee, Bradenton AREC Research Report GC 1982-2, edited by C. D. Stanley, is available from the Bradenton AREC, 5007 60th St. East, Bradenton, FL 33508.

(Maynard)

B. Vegetable Crops Calendar

May 27: Fertilizer and Lime Conference, Orlando, 9:15 AM

August 25-27: Master Gardener Program In-Service Training, Gainesville

September 16: Tomato Institute, Marco Island

(Maynard and Stall)

II. PESTICIDE UPDATE

A. Label Approval of Dual 8E Herbicide on Several Vegetables

Ciba-Gergy has announced that on March 5, 1982, the EPA has approved amended labeling for Dual 8E on 20 new crops. According to the Technical Release, the vegetables covered under the labeling now include: sweetcorn, potatoes, and pod crops, including: garbanzo, great northern beans, guar, kidney beans, lima beans, mung beans, navy beans, okra, peas (English, Southern peas, such as blackeye, pinkeye, crowder, etc.) pinto beans and snap beans.
B. Section 18 Label for Benomyl on Head Lettuce Granted

A section 18 specific exemption for the use of Benomyl to control lettuce drop (Sclerotinia sclerotiorum) and bottom rot (Rhizoctonia solani) on head lettuce has been granted by the EPA. The specific exemption is in effect until May 31, 1982.

C. Crises Exemption for Use of Metalaxyl on Potatoes

Doyle Conner, Commissioner, Florida Department of Agriculture and Consumer Services has granted a crises exemption for the use of Metalaxyl (Ridomil) on potatoes to control late blight (Phytophthora infestans). This crises exemption expires May 31, 1982. A Section 18 specific exemption has been filed for this use.

(Stall)

III. COMMERCIAL VEGETABLE PRODUCTION

A. The IR-4 Program Expanded Pesticide Labels for Minor Crops

Manufacturers budget time and funds for research and development (R&D) to register specific major pesticide uses. These uses must be large enough in order that pesticide sales exceed costs and profits are maintained. Many pesticide uses, however, are of such small scale that R&D costs would exceed income; therefore manufacturers will not become involved and essential needs remain without registration. The IR-4 Program is working to secure those "minor use" pesticide registrations which are neglected by the industry.

The IR-4 Program is a nationwide cooperative effort of the USDA-SEA (ARS and CSRS), EPA, separate state experiment stations, individual researchers, manufacturers and growers. With National Headquarters at Rutgers University, IR-4 is administered through a state agricultural experiment station in each of the four regions of the U. S. (southern, northeastern, northcentral and western) plus a special Agricultural Research Service Unit.

Requests for expanded pesticide uses as well as essential data from field and laboratory research flow through each regional office to National Headquarters. Information from all regions plus the manufacturer or registrant is compiled into a complete package and submitted to EPA for a national tolerance and subsequent registration.
The southern region office is located at IFAS, University of Florida and serves 13 states plus Puerto Rico and the Virgin Islands. Each state or territory, in turn, has a Liaison Representative who maintains communication with the regional office for regular updates on IR-4 progress and pesticide needs in his/her office.

At the beginning of the year IR-4 National Headquarters identifies priority pesticide requests and each region establishes a work plan to develop data on high interest pesticide needs. This year, the southern region is coordinating and partially supporting a record number of 65 vegetable projects. The following list is alphabetized according to commodity and includes the pesticide request I.D. number, pesticide, pest and location of field research. Research scientists in Florida are setting out 42 field trials.

IR-4 PESTICIDE PROJECTS/VEGETABLES (Cooperating State)

ASPARAGUS
319 Bravo/Cercospora leaf spot (OK)
1650 Disyston/aphids (NC)
1670 Lasso/weeds (NC)

BEAN
1249 Botran/Sclerotinia post harvest rot (FL)
1573 Paraquat/weeds (AR)

BROCCOLI
1526 Paraquat/weeds (AR)

CANTALOUP (MUSKMELON)
1730 Ambush/insects (FL)

CAULIFLOWER
1867 Benlate/Sclerotinia (FL)

CHINESE-CABBAGE
1869 Benlate/Sclerotinia rot (FL)
1810 Metasystox-R/aphid (FL)
1888 Monitor/insects (FL)
1855 Pydrin/insects (FL)

COLLARD
1612 Pydrin/insects (GA)
<table>
<thead>
<tr>
<th>Crop</th>
<th>Insect/Pathogen</th>
<th>Location(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>COWPEA</td>
<td>Dithane M-45/leafspots (GA, SC)</td>
<td></td>
</tr>
<tr>
<td>CUCUMBER</td>
<td>Pydrin/insects (FL)</td>
<td></td>
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<tr>
<td>DANDELION</td>
<td>Benlate/Sclerotinia rot (FL)</td>
<td></td>
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<tr>
<td></td>
<td>Lannate/lep. larvae (FL)</td>
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<tr>
<td></td>
<td>Monitor/leaf miner, lep. larvae (FL)</td>
<td></td>
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<tr>
<td>DILL</td>
<td>Lannate/lep. larvae (FL)</td>
<td></td>
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<tr>
<td>EGGPLANT</td>
<td>Nemacur/nematodes (FL)</td>
<td></td>
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<tr>
<td></td>
<td>Pydrin/insects (FL)</td>
<td></td>
</tr>
<tr>
<td>ENDIVE</td>
<td>Benlate/Sclerotinia rot (FL)</td>
<td></td>
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<tr>
<td></td>
<td>Monitor/leafminer, lep. larvae (FL)</td>
<td></td>
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<tr>
<td></td>
<td>Phosdrin/aphids (FL)</td>
<td></td>
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<tr>
<td>GINSENG</td>
<td>Diazinon/insects (NC)</td>
<td></td>
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<tr>
<td></td>
<td>Manzate 200/Alternaria blight (NC)</td>
<td></td>
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<tr>
<td>GREENS (MUSTARD)</td>
<td>Pydrin/insects (GA)</td>
<td></td>
</tr>
<tr>
<td>LEEK</td>
<td>Lannate/lep. larvae (FL)</td>
<td></td>
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<tr>
<td>NAPA CABBAGE</td>
<td>Benlate/Sclerotinia rot (FL)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Disystan/aphids (FL)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Lannate/lep. larvae (FL)</td>
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<td></td>
<td>Metasystox-R/aphids (FL)</td>
<td></td>
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<tr>
<td></td>
<td>Monitor/leafminer, lep. larvae (FL)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Nemacur/nematodes (FL)</td>
<td></td>
</tr>
<tr>
<td>OKRA</td>
<td>Triforine/powdery mildew (SC)</td>
<td></td>
</tr>
</tbody>
</table>
PARSLEY
1873 Lannate/lep. larvae (FL)
925 Lorox/weeds (FL)
1884 Monitor/leafminer, lep. larvae (FL)

PARSNIP
394 Bravo/Alternaria leaf spot (VA)

PEPPER
581 Roundup/weeds (FL)

PUMPKIN
998 Triforine/powdery mildew (VA)

ROMAINE
1862 Benlate/Sclerotinia rot (FL)
1876 Lannate/lep. larvae (FL)
1890 Monitor/leafminer, lep. larvae (FL)

RUTABAGA
632 Terraclor/wirestem (VA)

SPINACH
1861 Benlate/Sclerotinia rot (VA)
1858 Pydrin/insects (AR)
1764 Vydate/aphids (AR)

SQUASH
1731 Ambush/insects (FL)
1246 Difolaton/Phytophthora blight (GA)
1783 Triforine/powdery mildew (FL)

STRAWBERRY
1671 Blazer/weeds (FL)
1559 Amaze/insects (NC)
1676 Dual/weeds (FL)
1182 Nemacur/nematodes (FL)
1409 Roundup/weeds (FL)

SWEET POTATO
1003 Amaze/insects (LA, NC)
1619 Ambush/insects (LA, NC)
TOMATO
1463 Roundup/weeds (FL)

TURNIP
1654 Pydrin/insects (OK)
836 Terraclor/wirestem (VA)

WATERCRESS
1946 Gibberellic acid/promote growth (FL)
1789 Manzate 200/Cercospora leaf spot (FL)
1791 Phosdrin/aphids (FL)

The IR-4 National Program provides pesticide users with the most efficient means for expanding pesticide labels. This fact was supported by a statement in Pesticide and Toxic Chemical News, Feb. 25, 1981: "IR-4 takes the lead in obtaining tolerances for minor use pesticides." Every year for the past six years, IR-4 has obtained a greater number of EPA pesticide tolerance than any other institution.

Anyone aware of a pesticide need may alert IR-4 by completing a Pesticide Clearance Request form. Contact the Florida Liaison Representative: Dr. Art. W. Englehard, AREC, 5007 60th St., Bradenton, FL 33505, (813) 755-1568, or the Southern Region Coordinator: Dr. Charles W. Meister, Pesticide Research Lab., IFAS, University of Florida, Gainesville, FL (904) 392-1979.

(Meister)

B. Start Planning to Avoid Herbicide Residue Problems

Rotational crop and multi-crop per year production systems presently used in Florida have a high potential for problems arising from herbicide carry-over from one crop to the next.

In selecting a herbicide, one must not only consider the weed species selectivity encountered, but must carefully consider the residual life of a herbicide in the soil and the crops that can be planted after its use.

Herbicide recommendations are formally based on soil texture and organic matter content, but temperature, rainfall and soil pH also effect herbicide residual activity. Atrazine, for example, will have a greater activity as well as a longer persistance in soils that are
well limed than in more acid soils. This is a very important consideration when planting sensitive vegetables after corn. On the other hand, corn is sometimes injured by residues of certain dinitroanilines. Reduced corn growth has been experienced when planted in fields containing trifluralin residuals from previous crops.

Many times herbicide labels will contain precautionary statements and a listing of crops that can be planted safely after a certain time period. Herbicides are often classified as to persistence, or the time that amounts toxic to sensitive plants remain active in the soil. The longevity of phytotoxic effects of herbicides in soils under North Carolina conditions can be found in Table 1, page 9, of Herbicide Injury Symptoms and Diagnosis which can be found in the IFAS Weed Control Guide.

The key to avoid potential problems is to plan, and plan well in advance. In this way herbicide selection as well as other weed control procedures can be implemented to reduce weed competition and possible herbicide carry-over problems.

(Stall)

C. Providing a Safe Basis for Changing Practices in Vegetable Production

Vegetable growers, seeking relief in the everwidening cost-price squeeze are prone to consider new innovations, materials, and practices with less caution then they would under less strenuous circumstances. This specialist can list eight instances at this writing in which serious field production problems could have been avoided by a small scale on farm testing program, observations over a broader span of time, or an objective conference with the friendly agent.

Growers can protect themselves from many field and economic problems by developing their own simple testing and evaluation program. The simplest test involves "treating" a few rows in a standard production field by application of a test material, growing a new variety, or change of practice. With a bit more effort the grower can evaluate the influence of a test factor with much greater precision by following these simple guidelines:

1. Be a skeptic. The magic claimed for many new materials may or may not be effective on your farm or with your method of culture. Try a few rows in different parts of a field to be sure
that the material was in an average as well as best part of the field. Try enough of the new practice, variety or material to allow for a realistic yield response.

2. **Short, square test areas (or blocks) repeated** several places in a field are much better than a few very long rows. If several factors are to be compared at the same time have **all treatments in each test area (or block).**

3. If several treatments in each test area (or block) can be put out in a way so that each **comparison occurs in a mixed pattern or at random** (1-2-3, 3-1-2, 2-3-1 for example) the effectiveness of the test will be greatly improved. One treatment in each block should always be a non-treated or control unit.

4. All treatments should be clearly marked with wood stakes and a map of the test area should be kept in the farm office in case the stakes are accidently removed.

5. All treatment comparisons should be grown under conditions as uniform as possible (except for the specific factor to be tested). A growth regulator test, for example, should use the same cultivar, date of planting, method of culture, etc. as the rest of the test area.

6. **Make frequent observations** of the crop during the season. Scientists usually make systematic notes but even simple written observations can save a lot of wear and tear on the memory later. A written record of tests should be made and kept on file for future reference.

7. **Make careful harvest records.** If the entire test area cannot be harvested with a fair degree of accuracy, pick and record carefully the yield of 10-15 plants for each treatment in each repeated area (block). Keep records for each treatment and block separate, do not pool the figures as the influence of the field area may be lost.

8. **Summarize the records.** A possible test of two growth regulating materials for influence on yield may result in yield patterns such as these:
Treatmente Yield of Cucumbers, lbs per 30 plant block

<table>
<thead>
<tr>
<th>Treatment or Spray</th>
<th>North Field</th>
<th>East Field</th>
<th>South Field</th>
<th>Total</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Material A</td>
<td>97</td>
<td>69</td>
<td>91</td>
<td>257</td>
<td>86</td>
</tr>
<tr>
<td>Material B</td>
<td>63</td>
<td>77</td>
<td>47</td>
<td>187</td>
<td>62</td>
</tr>
<tr>
<td>Water Spray</td>
<td>80</td>
<td>70</td>
<td>75</td>
<td>225</td>
<td>75</td>
</tr>
<tr>
<td>Total</td>
<td>240</td>
<td>216</td>
<td>213</td>
<td>669</td>
<td>74</td>
</tr>
<tr>
<td>Average</td>
<td>80</td>
<td>72</td>
<td>71</td>
<td>74</td>
<td></td>
</tr>
</tbody>
</table>

9. Evaluate the records. The yield records could be subjected to statistical analysis but most vegetable growers may not wish to go to this trouble and rely on best judgement of treatment effect by comparison of averages. If only one test area had been used, such as that in the East field, material B may have been considered better than the untreated control or Material A. The yield in the East field favored treatment B for some reason; whereas, material A outyielded the control and material B in the other two fields. It is quite evident that several blocks provides a more effective evaluation than one block.

10. Draw conclusions with caution. One year's results may not be enough for practices that promise to be costly or could harm the crop under unfavorable environmental conditions. A rule of thumb worthy of consideration is to test carefully over several years and then decide. A good carpenter may measure twice before he cuts a piece of lumber.

(Marlowe)

IV. HOME VEGETABLE GARDENING

A. Know Your Minor Vegetables - Bambara groundnut

Bambara groundnut (Voandizela subterranea (L.) Thouars. has other common names such as congo groundnut, congo goober, Madagascar groundnut, earth pea, baffin pea, Njugo bean (S. Africa), voandzou, nzama (Malawi), indhlubu, and underground bean.

The leguminous plant is grown for its underground seeds. The entire plant is similar to the common peanut, being a low, flat annual with compound leaves of three leaflets. There is also an erect form. Like the peanut, it forms pods and seeds on or just below the ground. To achieve this, the flower stalk elongates and penetrates the soil. The bulbous tip creates a tunnel through which the fertilized flowers, attached just behind the tip, are drawn into the soil.

The pods are round, wrinkled, and over 1/2 inch long. Each contains one or two seeds which are round (1.5 cm diameter) smooth, and
very hard when dried. They may be cream, brown, red, mottled, or black-eyed. There are numerous nodules on the roots.

While seldom grown in the U.S., Bambara (also spelled Bambarra) groundnut produces a nutritious food under cultivation throughout Africa. It was carried to America by slaves, but has never caught on, probably due to the more popular peanut being higher in protein.

Bambara groundnuts grow best in climates suitable for peanuts (includes Florida). It needs bright sunshine, high temperatures, at least 4 months free of frost, and frequent rains to grow best. However, it seems to be highly adaptable and tolerates harsh conditions better than most crops. For example, it yields under conditions too dry for peanuts, such as the Bambara district near Tinbukta on the Sahara Desert’s southern fringe. It also is known to be grown in rain forest areas, and the cool moist highlands of Rhodesia.

It should be a natural for Florida gardens since it tolerates poor soils. In overly rich soils, high in nitrogen, it produces mostly top and only a few pods and seeds, as is the case with most fruiting vegetables.

When grown like the peanut, Bambara groundnuts take about 3 to 6 months to mature, depending on climatic conditions and cultivar type.

The seeds may be eaten raw when immature, but become too hard when mature. When roasted or boiled, even the mature (ripe) seeds are sweet and pleasant tasting. Sometimes the seeds are roasted and then ground into a nutritious flour. Seeds contain 14–24% protein and about 60% carbohydrate. The protein is reported to be higher in the essential amino acid methionine than is found in other grain legumes. Bambara groundnuts contain 6–12% oil, which is less than half the amount found in peanuts, making them non-useful as an oilseed crop.

Some of the pest problems known to attack it are Fusarium wilt, leaf spot, root-knot nematode, and a virus. These are worse in the rainy climates than in the dry areas.

The crop has possibilities as a garden vegetable in Florida. Finding a seed source is one of the biggest drawbacks, along with the selection of a most suitable cultivar.

(Stephens)
B. Master Gardeners Agent Training

After considerable discussion among County Agents, District Directors and myself, dates for the In-Service Training for Agents interested in the Master Gardener program have again been rescheduled. The new dates are August 25 - 27, 1982. The meeting will be in the Horticultural Science/Plant Pathology Building. If you plan to attend please make motel accommodations early, this is also the first week of Fall Semester for students and motels are usually filled to capacity.

The dates for this meeting were changed in order to give Agents more time to prepare for a fall training session if they are so interested.

Leon County Extension Agent, David Marshall, has completed training of his 38 Master Gardeners. These volunteers will assist David in home horticulture programs. Leon County is the fourteenth county in Florida to have the Master Gardeners program introduced to their community.

Anyone who would like to share with others information about program or projects your Master Gardeners have worked on are welcome to do so. Send the information to me and it will be compiled and published in the "Vegetarian".

(McDonald)

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