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I. Commercial Vegetable Production
   A. Seed-coat Color Effects on Germination of Table Legumes

A little known fact about some table legumes is that seed-coat color may affect germination. Heavily pigmented seed-types of snap beans and southern peas will often germinate better under field conditions than some of the light to cream-colored seed-types of these same crops. Differences may develop even though percentage germination as shown on the label may be essentially equal.
This information is based primarily on observations made by Extension specialists in the field, plant breeders in research plots, and seed analysts in seed testing laboratories. There is not much organized research to back up these observations. Nevertheless, we feel it is quite valid.

The only explanation that can be made is that seed pigments in some way tend to inhibit development of decay organisms in the soil. This explanation is based on the fact that differences in germination are not shown in tests under sterile laboratory conditions.

What is the value of this information? Simply, it should be taken into consideration and adjustments made, whenever possible, to compensate for the possibility of lower germination in the light color seed-types. These include such things as: (1) making sure that seed is well treated with a good fungicide; (2) increasing seeding rate of the light-coated seed-types; (3) avoiding periods of the season and soil conditions conducive to seed decay; and (4) employing cultural practices which do not encourage physical damage to the seed during planting and germination period.

NOTE: In checking out this information with the chief seed analyst of the Florida Department of Agriculture, the writer was informed that the analyst had observed differences in germination between white and yellow sweet corns, also. This observation is an interesting one for it appears that seed-coat pigments may also affect germination in other vegetable crops besides table legumes.

B. Nematode Control on Potatoes in Florida

Some growers in South Florida have been fumigating old land used for potato production regularly for a number of years. This has not been the case in Hastings area where the potato is one of the major crops. However, growers now are well aware of the potential benefits of fumigation for potatoes and most growers plan to use it for next season's crop.

Credit for the development of this information goes to Dr. D. P. Weingartner of the Hastings Station, Dr. D. W. Dickson of the Entomology and Nematology Department and Paul Dinkins and associates of the St. Johns' County Extension Office. They have conducted a series of research and demonstration plots over the past three years which proved conclusively that fumigation can pay for potato growers in the Hastings area. The following table is a summary of the results obtained in a test last year.
Table 1. Results of 1971 Experiment for Control of Sting and Stunt Nematodes on Potatoes

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Rate (GPA)</th>
<th>Marketable Yield (cwt/acre)</th>
<th>Skin Quality Rating</th>
<th>Specific Gravity</th>
<th>Sting + Stunt Nematodes</th>
<th>Mid-season Harvest</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>USTA</td>
<td>USIB</td>
<td>Total</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dowfume W-85</td>
<td>1.8</td>
<td>103.3</td>
<td>53.4</td>
<td>156.7</td>
<td>3.5</td>
<td>1.065</td>
</tr>
<tr>
<td>Telone</td>
<td>8.0</td>
<td>101.7</td>
<td>52.0</td>
<td>153.7</td>
<td>4.2</td>
<td>1.064</td>
</tr>
<tr>
<td>D-D</td>
<td>10.0</td>
<td>84.7</td>
<td>47.2</td>
<td>131.9</td>
<td>4.0</td>
<td>1.062</td>
</tr>
<tr>
<td>Vorlex</td>
<td>3.0</td>
<td>80.8</td>
<td>46.8</td>
<td>127.6</td>
<td>4.1</td>
<td>1.064</td>
</tr>
<tr>
<td>Control</td>
<td>-</td>
<td>38.5</td>
<td>34.9</td>
<td>73.4</td>
<td>6.4</td>
<td>1.069</td>
</tr>
</tbody>
</table>

1/ All data are mean values of 5 replications. All treatment values vary significantly from control at 1% level of probability.

2/ Skin quality ratings based on 1-10 scale with 1 being smooth skinned and 10 being totally russetted and fissured tuber surface. Reductions in skin quality were significantly correlated with mid-season populations of sting (r = .78) and stunt (r = .67) nematodes.

3/ Nematode counts are sums of sting and spiral nematodes extracted from replicated soil samples.

Even though the table is self-explanatory, two points need further clarification. The first point has to do with the results obtained with EDB (Dowfume W-85) this year which is in contrast to the two previous years. In 1971, it was among the best materials, but not so in 1969 and 1970 when it was in lowest group. Rates of EDB tested in 1969-70 may have been too high in some cases which, combined with adverse soil conditions, resulted in reduced sprouting in potato seed pieces. At that time, we suggested that growers not use EDB until more was learned about it. Based on the 1971 results, growers may wish to use EDB. Since we cannot fully recommend it, we advise growers who wish to use it to proceed with caution and suggest that they check with their EDB representative to be sure that all necessary precautions are followed in the use of this material.

The second point needing further explanation in the table is the net profit aspect for each treatment involved. Total yields do not tell the full story. Cost and quality improvement comparisons for the different treatments should be taken into consideration before one is finally selected for use.

A preliminary observation made in these studies is the relationship between nematode control and other diseases. Plants from non-treated areas were found to be infected with pathogens which often cause wilt. By reducing nematode injury to roots, fumigation may also help to reduce incidence of other harmful organisms which often gain entrance to the plant thru root injuries.

(Montelaro)
C. Need for Separating White and Yellow Sweet Corn Plantings

The last order of business for the writer on trips to the sweet corn producing areas of Florida is to pick up a crate of fresh sweet corn for the eating pleasure of family and friends. On one occasion last spring, it was a crate of "white sweet corn" known to be very sweet and quite low in pericarp. It turned out to be a mixture of ears of corn with kernels which were: (1) completely yellow, (2) completely white, and (3) yellow and white. Imagine the consumer's reaction in finding such a mixture at home after the purchase of "white sweet corn" supposedly.

Sweet corn growers know that cross pollination between white and yellow corn will produce yellow kernels on the normally white ears. Grade, appearance, and general acceptance in that kind of sweet corn is well below that of the pure white corn.

Prevention of this problem is a simple one. White and yellow sweet corn plantings have to be separated by distance or time. Actual distance required to prevent cross pollination depends on wind direction and velocities, barriers, etc. However, about a quarter of a mile separation should be adequate. Time between plantings should be regulated to prevent pollen maturation at the same time that the corn silks are receptive. Generally, 10 to 12 days are adequate between varieties of equal maturity periods. These are simple precautions to take in order to prevent lowering the appearance of an otherwise excellent vegetable.

(Montelaro)
II. Harvesting and Handling

A. Maintaining Chlorine in Vegetable Wash Water

Below are amounts of clorox or other bleaches to be added as a disinfectant to clear, clean water for initial concentrations of chlorine.

**Chlorine Solutions From Bleach (5.25%)**

<table>
<thead>
<tr>
<th>Desired ppm</th>
<th>ml/l</th>
<th>Desired ppm</th>
<th>ml/l</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>0.19(0.047)</td>
<td>200</td>
<td>3.81</td>
</tr>
<tr>
<td>20</td>
<td>0.38</td>
<td>300</td>
<td>5.71</td>
</tr>
<tr>
<td>30</td>
<td>0.57</td>
<td>400</td>
<td>7.62</td>
</tr>
<tr>
<td>40</td>
<td>0.76</td>
<td>500</td>
<td>9.52</td>
</tr>
<tr>
<td>50</td>
<td>0.95</td>
<td>600</td>
<td>11.43</td>
</tr>
<tr>
<td>60</td>
<td>1.14</td>
<td>700</td>
<td>13.33</td>
</tr>
<tr>
<td>Optimum</td>
<td>70</td>
<td>800</td>
<td>15.24</td>
</tr>
<tr>
<td>Concentrations</td>
<td>80</td>
<td>900</td>
<td>17.14</td>
</tr>
<tr>
<td></td>
<td>90</td>
<td>1000</td>
<td>19.05</td>
</tr>
<tr>
<td></td>
<td>100</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Chlorine Solutions From Hypochlorite (25%)**

<table>
<thead>
<tr>
<th>Desired ppm</th>
<th>ml/l</th>
<th>Desired ppm</th>
<th>ml/l</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>0.04</td>
<td>200</td>
<td>0.80</td>
</tr>
<tr>
<td>20</td>
<td>0.08</td>
<td>300</td>
<td>1.20</td>
</tr>
<tr>
<td>30</td>
<td>0.12</td>
<td>400</td>
<td>1.60</td>
</tr>
<tr>
<td>40</td>
<td>0.16</td>
<td>500</td>
<td>2.00</td>
</tr>
<tr>
<td>50</td>
<td>0.20</td>
<td>600</td>
<td>2.40</td>
</tr>
<tr>
<td>60</td>
<td>0.24</td>
<td>700</td>
<td>2.80</td>
</tr>
<tr>
<td>Optimum</td>
<td>70</td>
<td>800</td>
<td>3.20</td>
</tr>
<tr>
<td>Concentrations</td>
<td>80</td>
<td>900</td>
<td>3.60</td>
</tr>
<tr>
<td></td>
<td>90</td>
<td>1000</td>
<td>4.00</td>
</tr>
<tr>
<td></td>
<td>100</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Since concentrations dissipate following initial applications due to temperature, light, etc., and fixation onto organic contaminants, the solution of wash water must be monitored periodically in order to determine amounts of chlorine to add periodically. Monitoring devices utilizing the principles employed by swimming pool test kits may be used.

Wash water for most vegetables should be maintained at a range of 50-125 ppm chlorine (roughly 1-2 ml chlorox per liter of water or 1-2 oz. per 8 gal. water or 1/4 cup per 30 gal. water).

(Gull)

B. Grading Influences Quality

The purpose of grading is to separate produce into different categories. In some operations, it may consist of elimination of damaged or inferior units. More sophisticated procedures may not only discard produce that is inferior, but divide the remainder into grades based on any of a number
of criteria depending on the specific commodity. The former, simpler method is often used when produce is being field packed such as is often done with lettuce and cabbage. The more complicated system is usually located in a packinghouse. Most grading is based on USDA grades although some states have their own grades for certain commodities. These grades may even exceed Federal standards. Recently, some of the wholesale-retail outlets have begun to use their own grades based on the type of produce they wish to handle and the type of clientele they serve. This allows the buyers considerable latitude on the type of produce they are willing to accept.

One reason for grading produce is a uniform, more attractive pack. This is of considerable importance to a buyer and also creates a favorable impression on the consumer if that particular commodity is displayed in bulk at the retail outlet. Aside from the better appearance of graded produce, there is also the matter of protecting the commodity from pathogens. Most fruits and vegetables are relatively impervious to rots, etc., as long as the epidermal layer is unbroken. However, when the skin is broken there is not only an entry for pathogens, but also there is usually free moisture to enhance the possibility of spoilage via pathogens.

A common reaction for most members of the plant kingdom is to increase ethylene production in response to wounding. The presence of threshold level concentrations of ethylene (which may result from damaged produce) triggers increased ethylene production in healthy fruits and vegetables. Increased ethylene results in increased respiration. Any increase in respiration results in greater consumption of food reserves. It is apparent that although the initial increase in ethylene may be a result of damage, the effect is not limited to the damaged produce.

There are secondary materials which may be produced during respiration. The best known of these products is ethyl alcohol, the characteristics of which are well known and which are seldom injurious—particularly to plant life. However, if conditions are such that the overflow respiratory substrates cannot all be converted to ethanol, there are some side products that show up. Included in these are acetaldehyde and ethyl acetate, both of which are very toxic at rather low concentrations. These three compounds are escape valves for respiratory products that cannot flow into normal channels and are particularly important when respiration is rapid, air movement restricted, and the carbon dioxide derived from respiration of the produce is allowed to accumulate.

Economics are also involved in grading. If only the damaged units were involved, which is not the case, the handling and transportation costs would be the same for damaged units as for sound ones. The presence of bruised and damaged produce can result in a refused shipment (or accepted at a lower price). For every damaged or inferior unit that reaches the market and is not salable, the cost per unit of the remainder of the load is increased. When unsalable produce, which should be left in the field or at the packinghouse, is shipped, someone has to pay for the handling, shipping, and disposal of this produce. It has been shown many times that increased cost results in reduced sales. This hurts the shipper, packer, producer and everyone in the chain up to and including the consumer.

(Gull, Hicks and Showalter)
THE VEGETARIAN NEWSLETTER

III. Vegetable Gardening

A. Cucumber Varieties for Greenhouses

Although greenhouses do not have a prominent place in the culture of vegetables in Florida, some interest has been shown recently in the production of cucumbers in greenhouses.

Besides the normal question of economic feasibility, the main problem seems to be related to finding a suitable variety. Since the open pollinated field varieties like Ashley and Poinsett require bees to accomplish pollination, such varieties are obviously not designed for the enclosed greenhouse.

Hand-pollination has been attempted, but is tedious, time consuming, and expensive. The real answer has been the use of Forcing Cucumbers. These have been popular for many years in Europe, so are referred to as European forcing cucumbers. Forcing varieties are parthenocarpic; that is, they produce seedless fruits without the need for pollination.

The European greenhouse cucumbers are long, slim, and relatively thin-skinned. Some varieties of this type are Femspot, Femfrance, Factum, Fabulous, and Early Perfection.

The term "parthenocarpic" should not be confused with the more common "gynoecious" term. The latter refers to varieties which have a high percentage of female flowers, requiring the planting of a pollinator variety along with the gynoecious variety. Cherokee and Gemini are two examples of the gynoecious type.

(Stephens)

B. Organic Gardening Commentary

Taken from "Food Facts From Rutgers", August, 1971.

Organic farming is certainly making news. Controversial news.

And as the heat generated may indicate, there's a good deal more to it than just a farming technique.

But, as a farming technique--which is where it all starts--it's simple enough to describe. It's a matter of growing plants without using inorganic fertilizers and without pesticides. Instead, the soil is enriched, as it was a century ago, with organic matter only--manure, plowed-under plant material, leaf mold--and the battle of the bugs is waged by birds and predator insects. The weeds, too, are attacked as they used to be, by mulching and by pulling them out, not by sprays.

There the simplicity ends.
1. Motives, Mulch and Money

Beyond that, organic farming becomes a philosophy, or a way of life. It's part mystique, part respectable soil science. It makes odd bedfellows of the conservative old-timer and the hippie of the New Left.

And it's an anti-industrialist movement that is suddenly becoming--of all things--profitable.

As a symbol, organic farming reflects a good deal of the stress and strain in American society today. Its meaning is different to different people.

To some of its adherents, organic farming represents a nostalgic return to the way things used to be, to a less complex society. "I remember my father gardened organically, though they didn't call it that then", they say. "He'd take manure and leaves, make a compost, and the tomatoes he grew--well, you can't buy anything that tastes like that in the supermarket today."

To its youthful enthusiasts, organic farming represents the wave of the future and abounds in political and ecological overtones. These involve cooperation in place of competition, human beings working with nature instead of conquering and exploiting it.

"I just sort of feel better about it all," they say. "It's like the kick a good craftsman might get out of being able to make something fine with his hands, without using power tools. And anyway, don't you think a lot of our troubles come from always putting economic factors first?"

Or, as an article in the July, 1971, issue of the fast-growing "Organic Gardening and Farming" magazine puts it: "Many want to stop using only one yardstick--'Will it sell and be profitable?'...and add 'Will it be good for us in the long run?'

"'Good' refers to the effect of that product and how it is produced on our air, our water, our soil, our attitudes, the Earth we live on, as well as our fellow inhabitants and the generations to come."

To its opponents of course, organic farming represents a perverse spurning of the miracles of modern production agriculture. They see organic farmers as irrational dilettantes who simple refuse to come to grips with the very real problem of feeding a growing world population on a given land area.

As Dr. Earl L. Butz of Purdue University says in the New Jersey Farm Bureau's "This Week" report of July 10, 1971: "We can go back to organic agriculture in this country if we must. We know how to do it. However, before we move in that direction, someone must decide which 50 million of our people will starve!"

The organic farming advocates, in all fairness, do not generally recommend an immediate, wholesale return to non-chemical agriculture, though their literature does invite a traveling in this direction. But they are
talking about other changes as well, specifically a return to the land--"living off the land, living on the land"--so that a larger share of the population would once again be engaged in producing food.

That is, the famed 47 people now fed by a single farmer would shrink. It's not hard to understand why this prospect nettles those who have devoted their lives to make agriculture so fabulously productive, and who are justly proud of the accomplishment.

And from this opposition of purpose, of viewpoint, the claims and counterclaims go flying. These, at least, warrant examination on an objective basis.

2. A Tilth You Can Touch

Looking at the soil on an organic farm--loose, crumbly, easy for a plant to sink its roots in--a layman would certainly conclude that it looks "better". Poke a finger into this soil and it gives easily beneath the pressure. This is what is called the soil's tilth, or tillability. It is part of the ethic of organic growers to leave the soil better than they found it; one of their major claims is that they do so.

Soil scientists are in complete agreement on this score, as several from the Rutgers College of Agriculture and Environmental Science emphasize.

"Within reasonable limits, the more organic material you can introduce into the soil the better," says Dr. Warren Battle. "All good farmers are aware of that."

"We know that adding organic matter to the soil improves its water holding capacity, and its ability to store nutrients so they won't leach out," adds Dr. Stephen Toth. "And because organic matter binds silt and clay into larger aggregates, you also get better air movement through the soil."

Composting everything from kitchen garbage to yard clippings to manure is one way to add organic matter to the soil, and techniques for building a compost pile are a favorite subject in organic gardening literature. Mulches, to be plowed in later, are another method, and so is letting a field lie fallow every few years, and then turning the plant growth back into the soil.

Earthworms are encouraged, both for their tunneling activity and as an aid in the further decomposition of organic matter. And soil microorganisms are at work breaking down soil compounds into the nutrients plants need.

Here a second major claim of the organic growers emerges: that organically grown plants are healthier plants, and are thus a healthier source of food for people.

One offshoot of the argument is that, because these healthy plants resist disease and insects without the use of pesticides, there can be no danger to humans from pesticide residues.
3. What Pace for Plants?

But the major thrust of the claim is the nutritional one. Organically grown plants, it is argued, receive a naturally balanced diet, made available by microbial action at a rate that is in tune with the plants' own growth needs. Chemically-fed plants, on the other hand, may get an overdose of one nutrient from a fast-acting fertilizer, and this may block the intake of other essentials; or, some elements may be missing altogether.

What do the scientists say to this?

On the question of balance: "Soil nutrients can be unbalanced through the use of organic fertilizers just as well as with inorganic ones. Most organic materials are unbalanced in themselves. Whatever you use, you'd have to rely on an analysis," Dr. Battle says.

On the question of fast-acting fertilizers: "It's true that nitrogen is released relatively slowly by many organic materials, through microbial action, and this is an advantage. But we can duplicate this now by coating inorganic nitrogen fertilizer pellets with a resin, or by using synthetic organic nitrogen fertilizers such as urea formaldehyde," says soil scientist Dr. Roy Flannery.

On the question of beneficial microorganisms, which the organic advocates claim are destroyed by the chemical fertilizers: "In extreme cases you can kill microorganisms by inorganic fertilizers. But usually this only happens when it's done intentionally, to suppress soil disease," says microbiologist Dr. Richard Bartha.

But on the overall question of plant nutrition, Dr. Russell B. Alderfer, though he disputes the claims of superiority, adds that it's not an open-and-shut case.

"Here at Rutgers, we've grown plants on solely organic sources, and others solely inorganic ones and analyzed them for nutrients, vitamins, and so on; we could measure no differences," he says.

"But as to whether the human body can--I'd be the first to admit my ignorance," he adds. "There might be a trace of something or a chemical complex formed in a slightly different way. For instance, it's been a common observation of farmers, and it's true, that plants grown on land that has had regular applications of manure can withstand adversities of weather better than others. I could offer an explanation—that the organic matter improved the tilth of the soil, and that made all the difference."

"But we don't yet know just how nutrients get into the root of the plant. The rhizosphere, where the plant meets the soil, is an area that's still a mystery. All I can say is, if there are nutritional differences, we haven't found them."
4. **Specialize and Economize**

Two other issues are involved—the environmental implications, and the economic ones.

Clearly, organically-grown foods are more expensive. As agricultural economist Dr. A. Robert Koch explains, modern agriculture has become a "capital-intensive" operation, substituting machinery for human labor, and organic growing is a move back in the other direction. Using organic matter means transporting huge amounts of it from the centers where it accumulates—city garbage, manure from cattle country—to the farm; and the amounts must be huge indeed, because these are what the soil scientists call low-analysis materials. The same amount of plant nutrients can be supplied in much smaller bulk, and thus applied to the soil with much less labor as inorganic commercial fertilizers.

Further, many of the economies of modern farming come from the production of a single crop on a very large scale, and that means increased susceptibility to insect and disease attack. "The more diverse the system the more stable it is but the less productive," explains entomologist Dr. Billy Ray Wilson. "You can make organic gardening work very well on a small scale, but you get into trouble if you expand the operation and concentrate on a single crop."

Some people are willing and able to pay premium prices for organically grown foods, as attested by the health food stores that are proliferating in many communities. Even supermarkets have begun to cash in on the trend. But these amount to specialties that don't begin to touch the food needs of the vast majority, to say nothing of the hungry poor.

On the other hand, society's mounting need for better ways to get rid of organic wastes is a strong argument for a kind of farming that will put them to use. "The need for large volumes of organic matter in the soil dovetails beautifully with the waste disposal problem we have," Dr. Alderfer says.

Along with a way to recycle wastes, organic farming also promises better soil stability, with less erosion and less leaching of chemicals into the water supply. And there's the pesticide problem. Organic gardeners marshal a variety of non-chemical pest control measures—encouraging birds, bringing in predator insects like the praying mantis, bordering a crop with plants that repel particular insects. Entomologists question the effectiveness of these measures on a large scale, but they too are working on improved biological controls for insects.

And in the long run? Will organic growing remain the special province of the purists who choose it as a way of life for themselves? Or will its approach be reincorporated into the mainstream of modern agriculture—the use of much more organic matter in the soil, perhaps subsidized as a waste disposal measure, without abandoning the efficiencies of inorganic fertilizers too; the use of inventive new insect controls; perhaps combined with minimum amounts of pesticides to make possible the economies of large-scale crop production?
There's no way to predict. But at a very basic level, there may be less disagreement than there seems. "The real choice is to do nothing, or to manipulate the system to the best of our knowledge, and if we make mistakes, to learn from them," Dr. Bartha says. "When we plant crops at all, we are manipulating the system. The important thing is to be very thorough in investigating and anticipating the effects."

(Stephens)

C. Know Your Vegetables - Roselle

Roselle (Hibiscus sabdariffa) is a common garden plant in the tropics, and grows readily in Florida. Other names are Red Sorrel and Indian Sorrel. In the south it serves as somewhat of a substitute for cranberries. Victor is a good variety grown in South Florida.

The plant is an annual, 5 to 7 feet in height, with lobed leaves sometimes used for greens.

The main edible parts are the fleshy sepals, called a calyx, surrounding the seed boll in the flower. The calyx is bright red and acid, and can be used in preserves, jelly, juice, or a sauce like cranberry.

Roselle is usually started from seed but may be grown from cuttings. It is usually started in April in Florida, requiring about 4 months to mature. Culture is very similar to eggplants.

The "fruits" should be gathered before any woody tissue develops in the calyx. They should be tender, crisp and plump. As much as sixteen pounds of fruit per plant have been gathered in some South Florida plantings.

(Stephens)

D. Correction

It was brought to our attention that the Luffa gourd which was described in the last issue of the "Vegetarian" was incorrectly named Luffa cylindrica. The correct designation for the strongly ribbed type is Luffa acutangula.

(Stephens)
IV. Personnel Change

Dr. T. G. Hart, who has been serving as Assistant Vegetable Crops Specialist in Dr. M. E. Marvel's position while Mason is in Saigon, has left the department to take a position with the Rockefeller Foundation in a foreign assignment. The Vegetable Crops Department is currently searching for a replacement for Dr. Hart for the interval until Dr. Marvel returns.

(Marlowe)

V. County Conferences on Vegetable Crop Program Needs

Conferences with county directors, county agents and leading growers have been very helpful in finding out what research and extension program needs are felt by county agents and industry leaders. The Chairman of the Vegetable Crops Department has visited five counties in the past three months and a great deal of very meaningful communication has been accomplished. The real and felt needs expressed will be very helpful in shaping future research and extension programs. A summary will be prepared for all county staffs when the Phase I county conferences have been completed.

(Marlowe)