Table 3. Effect of fumigant on weed population 110 days after application (47 days after planting) and on the total time required to manually remove weeds from plots of gladiolus and sunflower during the fall experiment. Bradenton, FL.

Fumigant	Rate (lb or gal/acre)	No. of plants/ft²			Total[z] weeding time (Minutes/plot)
		Nutsedge	Clover	Broadleaf	
Nontreated	0.0	8.5ab[y]	10.2b	2.1a	17.2a
MBC	350 lb	0.1c	15.1a	0.0c	11.3c
Chloropicrin	350 lb	11.4a	8.5b	1.4ab	14.9ab
Metam-sodium	75 gal	0.0c	16.9a	0.1c	12.7bc
Dazomet	400 lb	1.2c	15.4a	0.4bc	13.3bc
Telone C-17	35 gal	5.3bc	10.7b	1.5a	14.4ab

[z]Total of two hand weedings.
[y]Treatment means followed by the same letter are not significantly different at the 5% level as determined by Duncan's new multiple range test.

metam-sodium and dazomet. Few differences existed in gladiolus and sunflower plant growth or flower production in the fall, but in the spring significant differences were observed. Fumigation with metam-sodium or dazomet generally improved plant vigor and flower production of gladiolus and sunflower. Delayed dissipation of chloropicrin containing compounds associated with cooler soil temperatures is not likely a factor in these results, as 56 days elapsed between fumigant application and planting in the spring. Although

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been lost due to the ravaging of this disease. Scientists and nurserymen from around the world struggled to identify the cause of LY and devise a treatment.

Intensive research efforts in the 1970's led to the discovery of a probable disease-causing agent known as a mycoplasma-like organism or MLO. In order to be classified as a true mycoplasma, an organism must first be grown in culture media and then undergo an array of diagnostic tests called "Koch's Postulates" in order to prove the identification of the pathogen. Because the MLO's associated with most plant diseases, including LY, have defied culture attempts, these organisms must be called "mycoplasmalike" for the present. Electron microscope studies have identified MLO in phloem (vascular) tissue of numerous declining palm species. Researchers now theorize that a leafhopper, *Myndus crudus*, carries the MLO and infects coconut palm trees as it feeds on leaves.

However, this discovery and resulting treatment methods have done little to stop this epidemic. Tetracycline injection has been shown to possibly lengthen the life of palms, but it hasn't saved any trees over a period of time.

In the early 1990's, a yellowing and subsequent dying of a few plants of liriope was observed in nurseries throughout central to south Florida. Results of tests performed by the Florida Department of Agriculture, Division of Plant Industry showed that the fusarium and phytophthora were present. I theorized the fungi found were secondary to something else damaging the heart of the grass. Five years later in 1995, microscopic investigation found a very tiny mite feeding in the bud of the grasses. This mite is so tiny that 20-50 would fit on a grain of pepper. This mite is in the Eriophyidae family and seems to affect only ornamental grasses that are very succulent and fast growing in containers. These mites do not seem to affect slower growing mature plantings in the landscape.

Other mites of the Eriophyidae family affect crops we are familiar with - citrus rust mite, juniper parsonite bud mite, azalea bud mite and tomato russet mite. All are somewhat controllable since we know what the causal agent is, and how to attack this group of organisms. Thus far, soap has been most effective in controlling this mite in the nursery.

Discussion

My association and subsequent knowledge of this family of mite led me to parallels and similarities between bud mite problems in liriopes and LY in palms. For months in the first quarter of 1996 I discussed with my colleagues the notion that a bud mite in the Eriophyidae family was the possible cause of LY in palms. My curiosity led me to cut down a few palm trees in the Florida Keys where LY is widespread. My initial observations on sick trees showed that the new growth (spear leaf coming out of the heart of the palm) was brown and rotting on that portion of the newly emerging leaf and was white and fresher looking as I progressed deeper into the heart of the tree. The same symptom pattern was observed on yellowing ornamental grasses.

This further fueled my investigation to look for a mite on healthy trees that were found in the midst of a LY outbreak. Conversations with landscapers and "tree-oriented" people in the Keys, led me to Grassy Key, where a heavy death toll of Jamaican Tall palms recently occurred. The first person I asked to cut down a healthy tree was reluctant but obliged me in my quest, stating that the tree was destined to die sooner or later.

Taking my microscope with me on this trip and carefully observing the tightly unfolded spear leaflets, I found numerous living, thriving, reproducing mites in the same location on the newly emerging leaf as I had found dead tissue on palms that were symptomatic with LY. These tiny creatures were very inconspicuous and could have been overlooked for a long time.

Samples of this mite were sent to the Florida Department of Agriculture, Plant Industry Division, in Gainesville, Florida, for identification. The mite was identified as *Acathrix trymatus* by Dr. Cal Welbourn and is of the same family as the previously mentioned eriophyidae mites found on liriopes. Dr. Welbourn stated this mite was discovered in the Philippines in 1962, but it never had been seen in the Western Hemisphere until my find on Grassy Key. Trials were inconclusive as to the relationship of this mite and cadang-cadang disease of coconut palms in the Philippines. Since my initial discovery of this mite on Grassy Key, I have found it on most all Jamaican Talls in the Keys and as far north as the Loxahatchee River in Jupiter, Florida. Another intriguing observation is that very few populations of this mite have been seen on the "Malayan Dwarf" palms which are somewhat resistant to LY.

In conclusion, *Acathrix trymatus* seems to be involved in LY of coconut palms, possibly by the acute stress that high populations of a mite could cause on the heart of the palm, leaving it prone to attack by bacteria, fungi, viruses, mycoplasmas, viroids, etc.

At present, I am privately initiating research to test this theory and invite scientists to look closely at *Acathrix trymatus* and the role it may play in LY.

New approaches of combating pests in agriculture as well as home gardening are here and are very exciting and rewarding. Breeding of resistant palms is already under way in Florida, Jamaica and elsewhere throughout the world. Other avenues of mite control include parasitic fungi and predatory mites. Possibly there is a new hope for attacking this lethal disease in Jamaican Tall and other palms such as the Date Palm, that are still dying mysteriously whether from some mycoplasma-like organism, illusive viroid or maybe just a tiny mite.