April 28, 2000

A series of cool fronts passed through the area over the past two weeks keeping temperatures a few degrees cooler than normal for late April. Nighttime temperatures have ranged in the 50’s and 60’s, with a few nights dipping into the upper 40’s, while most days have seen the mercury in the low to mid 80’s.

Although most areas saw some rainfall over the past two weeks, total accumulation was extremely variable across the region. The highest totals were seen in Devils Garden, where a number of respondents report receiving 6 – 7 inches of rain over the weekend of April 15 – 16. High winds and hail was also reported in some areas but damage appears to be minimal in most cases. The FAWN Weather Station in Immokalee recorded only 0.94 inches of rain for the period. Many other reports indicate that the average for the area was between 1-2 inches, with total rainfall generally higher as one moved north and east.

Conditions have remained windy. The wind, in combination with warm sunny days, has resulted in daily evapo-transpiration rates ranging from 0.19 to 0.25 inches. Many growers have reported observing plants suffering from mid–day moisture stress on most afternoons.

Although growers in eastern parts of Hendry County have reported some relief from recent showers, many growers continue to report difficulty in irrigating. Over all any benefit from recent showers was short-lived and most growers indicate that they are running their irrigation pumps around the clock in an effort to maintain adequate soil moisture for optimum plant growth. There continue to be scattered reports of salt related problems in seep irrigated crops. Others have reported some amount of blossom end rot and cat facing of fruit, although we have see nothing approaching the problems that we experienced last year. Growers on drip systems have generally minimized such problems.

Blossom-end rot is a physiological disorder caused by calcium deficiency and water stress. The blossom-end of the fruit collapses and shrivels to a leathery, dark, dry rot. Blossom end rot is commonly seen on tomatoes, peppers and watermelons. Any condition which limits calcium availability to the fruit leads to blossom-end rot.

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COOPERATIVE EXTENSION WORK IN AGRICULTURE, FAMILY AND CONSUMER SCIENCES, SEA GRANT AND 4-H YOUTH, STATE OF FLORIDA, IFAS, UNIVERSITY OF FLORIDA, U.S. DEPARTMENT OF AGRICULTURE, AND BOARDS OF COUNTY COMMISSIONERS COOPERATING
These include acidic soils, droughty soils, salt build-up, flooded soils and high humidity. Elongated fruits seem to be affected more than round fruit. Calcium moves in the water stream, in the plant, so it does not move preferentially to fruit, but to leaves. Excessive N can lead to excessive vegetation and encourage low calcium transport to fruits.

To control this problem, growers need to avoid those conditions listed above by following a program of soil testing and careful water management. It is important to not that foliar fertilization with calcium is normally difficult and ineffective because it requires many frequent applications of calcium, in small amounts, to provide enough calcium to youngest plant parts and usually will not cure blossom-end-rot.

The National Weather Service extended forecast for the next five days calls partly cloudy conditions with highs in the low to mid 80’s and lows around 60.

The watermelon harvest is approaching its peak. Harvesting of many other crops is slowing seasonally, and harvesting of many fields is expected to be over in the next few weeks. Major vegetables harvested during the week include potatoes, tomatoes, peppers, cabbage, cucumbers, snap beans, squash, sweet corn, eggplant and watermelon. Disease and insect pressure has been fairly light with the exception of scattered hot spots.

Spider mites are active in several crops. Several growers are experiencing problems with spider mites on eggplant, tomato, as well as melons, cucumbers and other crops. In most instances, infestations are largely confined to drier dusty areas along roads and field margins, although there have been some reports of more serious infestations. Occurrence is spotty and damage is low to moderate in most cases.

There are several species of spider mites that attack vegetables. The red spider mite and the two-spotted spider mite are the most common. The red spider mite is often referred to as red spider, the red mite, or spider mite.

Spider mites are favored by hot dry weather, which also aggravates injury by stressing the plant. Leaves become blotched with pale yellow, reddish brown spots ranging from small to large areas on both upper and lower leaf surfaces. If infestation is severe, leaves become pale and sickly in appearance, gradually die, and drop off the plant. Before death the leaves look as though they have been dusted with some sort of powder, which is caused by numerous molted skins of the mites coupled with a depletion of leaf chlorophyll.

Mites generally injure above ground plant parts by removal of plant sap or cell contents with their needle like mouthparts or stylets. Sap removal can debilitate plants by removing nutrients and water. Removal of cell contents results in leaf injury and fruit scarring. Saliva injected during feeding contains enzymes and other substances that may produce toxic responses in plants, producing discoloration, necrosis or abnormalities on leaves, stems and fruits.

Damage is often underestimated since the wounds they make are not apparent to the eyes of the observer. These pests are particularly bothersome in dry weather since they account for added strain on plants, already short of moisture.

Overall plant symptoms caused by either severe or constant attack are characterized by distorted leaves, overall loss of plant vigor (in spite of adequate moisture and nutrition), spotting of leaves, eventual yellowing of the plant or some of the leaves, and in some cases loss of foliage and death. In the case of fruit or pods the piercing-sucking group causes off-color spots or wart like growths (tomato), pod drop (beans), and fruit curvature of the fruit (okra, melons etc.).
Spider mites may be whitish, green, or red, depending upon age and species. Adults are about 1/60 inch long. Mites are more closely related to spiders than to insects and generally have eight legs except when just hatched, when they have six legs like insects. Males are oblong in shape while females are more round.

Spider mites live on cell sap, which they draw by piercing the leaf with two sharp, slender lance-like stylets. Almost all types of crops are subject to attack by some species of spider mite. The mites are also severe pests of plants grown inside or in greenhouses. Those that attack vegetables spin webbing on the plant surface, and also migrate by spinning a long strand of silk and ballooning on the wind. The first outbreak of mites in a field generally occurs around barns, fences, trees, or some obstacle in the field acting as a windbreak. A good indicator of spider mite buildup is often the presence of bleached out looking nightshade plants at field margins and waste areas.

Spider mites reproduce rapidly under favorable conditions, and control can be difficult. Biological control with predaceous mites that can be purchased commercially is a viable option but must be initiated before populations have a chance to build up. In assessing the need for chemical control, consideration should be given to the age structure of the population. A numerous nymphs to adult ratio signal a population likely to increase, whereas numerous adults may signal a declining population, especially if a disproportionate number of males are present. If chemical control is deemed necessary, care must be taken to select an appropriate miticide and thoroughly cover the plants. In Florida, a second application must be applied from five to seven days following the first, to kill mites that were eggs at the first spray. If more than five to seven days are allowed to pass after the first application, new females will have matured and laid eggs again. Therefore, a second spray kills the nymphs before they reach maturity and lay eggs, which in turn would provide for a new generation.

Broadmites are being reported in pepper and eggplants. Occurrence is sporadic and damage low.

Growers are trying to stay ahead of worms as the season winds down. Growers are reporting scattered outbreaks of southern armyworms, beet armyworms, loopers, and tomato fruitworms as well. Armyworms are active in tomatoes, peppers, crucifers, cucurbits and a number of other crops. There have been scattered reports of “rindworms” in watermelon but little damage overall.

Loopers may be devastating pests of many vegetable crops. They get their name from the looping, humpback motion caused by the first three pairs of slender "true legs" moving the head and thorax forward, followed by the three pairs of fleshy "prolegs" to bringing up the club-shaped rear end. Non-looping caterpillars generally have another two pair of prolegs in the middle of the abdomen that loopers lack.

The cabbage looper and soybean looper are the worst pests of the group. Cabbage looper attacks crucifers as well as lettuce, spinach, beet, pea, celery, parsley, potato, and tomato and soybean looper attacks peanut, pea, cotton, sweet potato, tomato, and tobacco. The larvae are difficult to distinguish: both are green with light, longitudinal stripes, but the adult cabbage looper has a light mark on the forewings resembling a figure eight, whereas the light mark on the soybean looper’s forewing does not. The larval stage lasts for two to four weeks and pupation occurs in a loose cocoon attached to leaves of the host plant. There are usually three to four or more generations per year.

Control of the loopers is often more difficult than for many other species of caterpillar, due to the development of resistance to many commonly used insecticides. In addition, loopers move quickly to protected parts of the plant after a spray; therefore, thorough spray coverage of the plant is important. Proper insecticide selection is also necessary, since many standard worm control agents will not control loopers. It is important to detect loopers while they are still small, since like the beet armyworm, they become extremely difficult to kill after they get larger.
Melonworm and pickleworms are active on cucurbits in some places. For the most part, respondents indicate that they have been able to remain on top of the situation and damage has been minimal.

Both caterpillars attack only cucurbits. Although the pickleworm prefers summer squash, it may severely damage cucumber and cantaloupe also. The melonworm prefers foliage of muskmelon, squash, and cucumber. It very rarely attacks watermelon.

Reports indicate that thrips are beginning to slow down. The main species being observed is Florida flower thrips – (Frankliniella bispinosa). Although thrips are being seen widely in several crops including tomato, pepper, eggplant and cucurbits few major problems have been reported. There are some scattered reports of dimpling on tomato fruit associated with flower thrips inserting eggs on small fruit. Damage to pepper fruit has been more widely reported and is presently of greater concern to growers.

Pepper weevil numbers remain at high levels in many locations. In a number of cases, they have moved into new fields causing damage in young plants including damage to foliage and growing points and weevil larvae have been observed in dropped flower buds in pepper that is just starting to set fruit. Many growers are battling to remain in control of the situation.

At present Vydate 2L is the most efficacious product available to growers for the control of pepper weevil. Since most fields are being actively harvested control is complicated by 7 day PHI associated with this product.

Research conducted by Dr. Phil Stansly at SWFREC in 1999 demonstrated comparable control with two sprays of Actara three weeks apart to that provided by seven weekly applications of Vydate.

Reports from knowledgeable sources indicate there has been some interest in pursuing a Section 18 for Actara on pepper. Labeling of this material would provide growers with a welcome alternative product for rotation with Vydate in pepper weevil control.

Aphid pressure is down although aphids continue to be observed in several crops including eggplant, leafy greens, melons, pepper, squash and tomato. Several respondents who had previously reported battling to achieve control indicate that the reduction in aphid pressure has finally allowed them to get on top of the situation.

Pinworms remain active in most areas, although reports indicate that trap counts have decreased. There have been few reports of fruit damage.

A rise in stinkbug activity has been reported in tomato. Damage has been minimal.

Stinkbugs (Pentatomidae) are green or brown shield-shaped bugs, ranging from ½ to two-thirds inch long. Eggs are barrel-shaped and found on undersides of leaves in masses of 10 to 50. Nymphs are similar in shape to adults, but are more brightly colored and patterned. Stinkbugs and the closely related leaffooted bugs emit a strong odor when disturbed.

Stinkbug nymphs and adults suck juices from green fruit leaving a puncture wound, which may later become surrounded by a discolored zone due to invasion of secondary pathogens. A lightened, sometimes depressed blotch beneath the fruit surface often surrounds feeding punctures.

Respondents are indicating that whitefly pressure continues to increase. Populations are reaching fairly high levels in older tomato fields where counts of 10 or more per plant are not uncommon. A number of growers are reporting high populations of whiteflies in pepper from several widely scattered locations. In some
instances, growers are reporting movement from pepper to adjacent tomato plantings. Whiteflies are also building up in melons and cucumbers. In general, populations remain below levels seen in previous years. 

Whitefly populations can develop rapidly under long days and high temperatures at this time of year.

Despite increased whitefly pressure, TYLCV continues remains low. Most growers are still seeing only isolated occurrences of single infected plants here and there. Several respondents have noted a slight increase in the incidence of TYLCV. Incidence remains well below 1% in most cases. However, whereas a few weeks ago it was necessary to cover 50 –100 acres to find one infected plant, it is now possible to find one infected plant in every 5 – 20 acres in a number of locations. Fortunately crops have reached a stage where the potential for major problems from the disease has begun to diminish.

Respondents have reported the occurrence of powdery mildew in watermelon. Incidence is sporadic and damage low. Powdery mildew is also widely present in zucchini and yellow squash particularly in older fields.

Powdery mildew has also been reported in pepper and tomato. In some tomato fields, disease pressure and severity has resulted in growers initiating control measures.

Downy mildew continues to be reported on cucurbits from a number of widely scattered locations across the area. Recent rains have flared the disease in some areas. Most reports of the disease are from cucumber, muskmelon and specialty melons. Respondents indicate that the disease is largely under control, although it continues to spread slowly assisted by harvest operations and foggy, dewy mornings.

Early blight (Alternaria sp.) and target spot has been reported on tomato. In general, incidence and occurrence is low although some increase has been noted in older planting where the size of the bush and harvesting is complicating control efforts.

In general, however, problems with foliar diseases on tomato and pepper have been minimal.

There has been some localized increase in bacterial leaf spot activity on pepper and tomato. As might be expected problems have been greatest in areas most affected by recent rains and foggy mornings. Incidence and damage is low and occurrence patchy. There have been a few isolated reports of bacterial speck on tomato.

Recent rains caused gummy stem blight to flare up on watermelon in a number of locations. Resumption of dry weather has prevented any major problems. Occurrence remains sporadic. Incidence is low to moderate.

Powdery mildew and mosaic is widely present in squash across the area. Incidence and damage is variable. Problems are generally most severe in older plantings.

Watermelon mosaic on watermelon is being reported from several widely scattered sites. Incidence is low and most fields are in such an advanced state of maturity that mosaic is unlikely to have a serious impact on production.

Fusarium wilt is being reported widely on watermelon across the area. Some plantings have been hard hit. This is not surprising, as many growers have been producing melons for many years on the same piece of ground. In addition, there has been a strong trend toward the production of seedless cultivars, which do not have fusarium resistance.

Fusarium crown rot continues to affect tomatoes in areas where fusarium has traditionally been a problem.
There have been a few widely scattered reports of tomato spotted wilt virus on tomato across the area. The tomato spotted wilt virus is vectored by several species of thrips. It has traditionally been more of a problem in northern Florida.

Affected plants have a bronzing of top foliage initially. Gradually the signs of infection move down the plant, causing a browning of the stem. Plants eventually suffer stunting and even wilting, although I have not seen much of this.

The telltale sign of infection is the formation of small ring-like figures on the fruit. This is the most devastating part of the problem because these rings make tomatoes unmarketable.

As we approach the end of the spring season, it is not too early to start thinking about and even implementing your fall season IPM program. With all the advances in pest management, new chemistries and space age spray rigs, it is often easy to overlook some of the basics.

Field sanitation is one of the most important tactics in vegetable pest and disease management. The best thing that growers can do for themselves and their neighbors is to clean up crop residues promptly after harvest. Sanitation is an important IPM technique that should not be over looked as an effective, preventative tool against many vegetable pest and disease problems. Sanitation includes any practice that eradicates or reduces the amount of pathogen inoculum, pests, or weed seeds present and thus helps reduce or eliminate subsequent pest and disease problems.

Prompt crop destruction at the end of the season will immediately end the production of disease inoculum and insects and eliminate the spread of diseases and pests to any other host plants in the vicinity. Downy and powdery mildew on melons can spread via wind from older, diseased plants to plants in surrounding fields that are still maturing. These diseases are obligate parasites. This means that they can only grow and multiply on living host tissue. Some plant pathogens, such as the bacterium that causes bacterial spot of tomato and pepper, are unable to survive for extended periods of time outside of the host tissue. Plowing or disk ing under infected plant debris helps not only by covering up the inoculum but also speeds up the disintegration of plant tissue and kills the pathogen. Good sanitation will help control a number of important vegetable pathogens.

Destruction of tomato vines will kill off white fly populations and eliminate transmission of the tomato yellow leaf curl virus to subsequent crops and also eliminate inoculum from late blight and other fungal diseases. This is particularly important in the case of TYLCV, as sanitation and whitefly control are the only tools currently available for the management of this disease. A crop-free period is also considered a necessity for the control of a number of other important vegetable pests such as pepper weevil, tomato pinworm, and Thrips palmi and is recommended for management of all vegetable pests.

Weeds and volunteers should also be removed to prevent the survival and over-summering of pathogens that could serve as inoculum reservoirs for the next crop. Techniques such as mowing off pepper should not be relied upon as this often results in re-sprouts which can harbor pests and disease problems over summer.

The use of cover crops and summer fallowing of fields are also effective tools in reducing weed populations that can cause problems in the subsequent crop. The role of summer fallow in weed management is often overlooked. Summer fallow keeps new weed seeds from being added to the soil seed-bank. It also reduces the increases in asexual propagated plants such as nutsedges. Yellow nutsedge can put out 70 new tubers (nuts) every two months. Keeping the weeds from propagating will reduce the weed problems encountered during the next cropping season and help reduce insects and diseases that may over summer in weedy fields.
Chemical falling is a twist on the traditional method of falling that depends on discing fields throughout the summer period to reduce weed pressure in subsequent crops. One approach uses Roundup to kill weeds during the crop free period.

The key to a successful chemical fallow program is the timing of the applications. Two Roundup Ultra treatments with one tillage trip in between should cover the entire fallow period.

**Procedure**

Disc field after harvest.
Allow weeds to germinate and grow to a desirable height (approximately 25-30 days).
Treat with Roundup Ultra (first treatment).
Allow treated weeds time to translocate product throughout plant (at least one week).
Lightly disk field (can be one to five weeks after herbicide treatment).
Allow weeds to germinate and regrow to a desirable height (approximately 25-30 days).
Treat with Roundup Ultra (second treatment)
Allow treated weeds time to translocate product throughout plant (at least one week).
Prepare field for planting (can be one to five weeks after herbicide treatment).

**Note:** Allow 3 days between last application and planting. Given the impending loss of methyl bromide, such techniques may prove valuable in some vegetable cropping systems for the control of persistent weed species such as nutsedge.

Field sanitation will be come an increasingly important tool to growers in face of the impending loss of methyl bromide – whose ease of use and effectiveness in controlling a wide range of problems allowed us to neglect some of these practical common sense pest management techniques.

There are a number of alternatives to methyl bromide out there and growers would be well advised to start to consider these and experiment with them before the 2005 cutoff date. Supplies are already starting to get tight and prices are rising on this material. MB alternatives will certainly involve some changes in your crop management program and it would be wise to see what’s involved and how these alternatives might be successfully incorporated into your operation. **Note:** we have a series of growers meetings on MB alternatives planned in May – see the schedule below.

**Up Coming Meetings:**

**May 4, 2000**
Summer Chemical Fallow Techniques using Roundup – 5:30 PM
Southwest Florida Research & Education Center, Immokalee
*For more information, contact Gene McAvoy at 863-674-4092*

**May 10, 2000**
2000 Spring Vegetable Field Day and Growers Meeting 10:00 AM – 2:00 PM

**Don’t miss this one** – lots of exciting research will be highlighted including methyl bromide alternatives, totally enclosed seepage irrigation, bio-stimulants, pest and disease trials including chemical control of silverleaf whitefly and TYLCV, tomato pinworm control, rindworm control in cantaloupe, pepper weevil control in serrano pepper and tomato variety trials for TYLCV resistance.

Southwest Florida Research & Education Center, Immokalee
*For more information, contact Gene McAvoy at 863-674-4092*
May 11, 2000 Vegetable Grower and Industry Meeting – SW Florida Vegetable Research Investment Fund – 5:30 PM – see announcement below.
Southwest Florida Research & Education Center, Immokalee
For more information, contact Gene McAvoy at 863-674-4092

May 17, 2000 Methyl Bromide Update - – 5:30 – 7:30 PM
Impact of Restrictions and Proposed Ban of Methyl Bromide on Cropping Practices and Practical Considerations for Vegetable Growers Regarding Methyl Bromide Alternatives
Southwest Florida Research & Education Center, Immokalee
For more information, contact Gene McAvoy at 863-674-4092

May 15 –19, 2000 Aquatic Weed Control Short Course – earn up to 26 CEU’s
Fort Lauderdale Research and Education Center
3205 College Ave
Fort Lauderdale, FL 33314
For more information, contact Dr Vernon VanDiver at 954-475-4125

Web Sites:

The University of Florida's Pesticide Information Office has completed crop profiles for carrots, celery, citrus, ornamentals, peppers, potatoes, snap beans, strawberries, sweet corn, tomatoes and watermelons. They have been posted on the USDA Office of Pest Management Policy's Crop Profile (OPMP) Web site at http://ipmwww.ncsu.edu/opmppiap/proindex.htm. Click on Crop Profiles and then on Completed Crop Profiles by Territories/States, scroll down to Florida to see the profiles developed for Florida Crops. The site contains over 200 crop profiles have been completed by the states and territories.

The Cucurbit Downy Mildew Forecast Homepage based at NCSU. This unique site indicates the occurrence of downy mildew in the United States and forecasts the trajectories of inoculum (fungus spores) from known sources. It is fascinating to see how far these spores can travel under ideal conditions. Check it out at http://www.ces.ncsu.edu/depts/pp/cucurbit/. Note this URL was listed incorrectly in the last edition.

Plant Facts – the Ohio State University has established up a very useful extension fact sheet data base and university search engine for answering plant-related questions from 46 different universities and government institutions across the United States and Canada. It allows easy access to over 20,000 pages of Cooperative Extension fact sheets and bulletins to provide a concentrated source of plant-related information. Searches are key word based and can delimited by region if desired. Go to http://plantfacts.ohio-state.edu/

The Army Corps of Engineers - Everglades Restoration Web Site - Everglades Restoration will ultimately affect all agricultural producers in South Florida. The Water Resources Development Acts of 1992 and 1996 provided the U.S. Army Corps of Engineers with the authority to review the Central and Southern Florida Project and to develop a comprehensive plan to restore and preserve the ecosystem while enhancing water supplies and maintaining flood protection. See what is being planned at http://www.evergladeplan.org.

The Comprehensive Everglades Restoration Plan resulting from the effort calls for a series of interventions over more than 20 years with an estimated cost in excess of $7.8 billion and rising daily. This is a slick and glossy web site, but don’t believe everything you read! In our area, much of the plan is based on a series untired and untested above ground reservoirs intended to hold water that normally flows to the sea in the rain season. It will require some 8,000 – 25,000 acres of prime agricultural lands in Hendry County alone.

Southwest Florida Vegetable Research Investment Fund Launched
Vegetable farming has never been an easy proposition and in recent years survival in this dynamic environment has not been easy. The Southwest Florida Vegetable Advisory Committee has been pondering this situation for the past few months and has considered ways to alleviate the plight of area growers and help shift the competitive balance in their favor. With this goal in mind, the committee has decided to launch the “SW Florida Vegetable Research Investment Fund.” The fund is envisioned as a strategic partnership of growers and others in the vegetable industry who come together to pool their resources to address research needs of common concern.

The SW Florida Vegetable Research Investment Fund is set up to be managed by the contributor-members who will prioritize and fund research projects through a democratically elected advisory committee. Membership will be based on contributions of one dollar per cropped acre per year or flat fee for non-growers. Contributors will hold the purse strings and will be free to choose from public or private research groups and hold researchers accountable for performance. An organizational meeting will be held in Immokalee in May 11th, 2000 at the SW Florida Research and Education Center at 5:30 PM.

Everyone involved with the vegetable industry is strongly urged to come out and hear more about the fund and how it will help you. Government support for agricultural research is waning and often devoted to projects of little immediate importance to commercial growers. By participating in the SW Florida Vegetable Research Investment Fund, you will be helping to ensure the future of practical research that addresses the needs of local vegetable growers will be supported. The strength and ultimately the future survival of not only the vegetable industry in southwest Florida but also every vegetable grower will depend on cooperation and unity within the industry.

I urge you to come out on May 11th and hear more about the fund from your fellow growers. The meeting is open to everyone involved in the vegetable industry and dinner will be provided.

I hope you will consider this proposal favorably - your future may depend on it!

Contributors include: Karen Armbrester/SWFREC, Jim Connor/SWFREC, Bruce Corbitt/West Coast Tomato Growers, Marty Gross/SWFREC, Ed English/Pacific Tomato Growers, Fred Heald/Farmers Supply, Sarah Hornsby/AgCropCon, Cecil Howell/H&R Farm, Leon Lucas/Glades Crop Care, Gene McAvoy/Hendry County Extension, Alice McGhee/Thomas Produce, Tim Nychk/Nychk Bros. Farm, Chuck Obern/C+B Farm, Dr. Pam Roberts/SWFREC, Wes Roan/6 L's, Kevin Seitzinger/Gargiulo, Jay Shivler/ F& F Farm, Ben Stanaland/Pacific Tomato Growers, John Stanford/LNA Farm, Mike Stanford/MED Farms, Dr. Phil Stansly/SWFREC, Eugene Tolar/Red Star Farms, and Dr.Charlie Vavrina/SWFREC, Donna Verbeck/GulfCoast Ag.

The SW Florida Pest and Disease Hotline is compiled by Gene McAvoy and is issued on a biweekly basis by the Hendry County Cooperative Extension Office as a service to the vegetable industry.

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