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In This Issue

Dollars from Dirt: Economy Spurs Home Garden Boom

Gillian Flaccus
Associated Press
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LONG BEACH, Calif. - With the recession in full swing, many Americans are returning to their roots - literally - cultivating vegetables in their backyards to squeeze every penny out of their food budget.

Industry surveys show double-digit growth in the number of home gardeners this year and mail-order companies report such a tremendous demand that some have run out of seeds for basic vegetables such as onions, tomatoes and peppers.

"People's home grocery budget got absolutely shredded and now we've seen just this dramatic increase in the demand for our vegetable seeds. We're selling out," said George Ball, CEO of Burpee Seeds, the largest mail-order seed company in the U.S. "I've never seen anything like it."

Gardening advocates, who have long struggled to get America grubby, have dubbed the newly planted tracts "recession gardens" and hope to shape the interest into a movement similar to the victory gardens of World War II.

Those gardens, modeled after a White House patch planted by Eleanor Roosevelt in 1943, were intended to inspire self-sufficiency, and at their peak supplied 40 percent of the nation's fresh produce, said Roger Doiron, founding director of Kitchen Gardeners International.

Doiron and several colleagues are petitioning President Obama to plant a similar garden at the White House as part of his call for a responsible, eco-friendly economic turnaround. Proponents have collected 75,000 signatures on an online petition.

University of Massachusetts, United States Department of Agriculture and Massachusetts counties cooperating.
The Cooperative Extension System offers equal opportunity in programs and employment.

"It's really part of our history and it's part of the White House's history," Doiron said. "When I found out why it had been done over the course of history and I looked at where we are now, it makes sense again."

But for many Americans, the appeal of backyard gardening isn't in its history - it's in the savings.

The National Gardening Association estimates that a well-maintained vegetable garden yields a $500 average return per year. A study by Burpee Seeds claims that $50 spent on gardening supplies can multiply into $1,250 worth of produce annually.

Doiron spent nine months weighing and recording each vegetable he pulled from his 1,600-square-foot garden outside Portland, Maine. After counting the final winter leaves of Belgian endive, he found he had saved about $2,150 by growing produce for his family of five instead of buying it.

Adriana Martinez, an accountant who reduced her grocery bill to $40 a week by gardening, said there's peace of mind in knowing where her food comes from. And she said the effort has fostered a sense of community through a neighborhood veggie co-op.

'We're helping to feed each other and what better time than now?" Martinez said.

A new report by the National Gardening Association predicts a 19 percent increase in home gardening in 2009, based on spring seed sales data and a telephone survey. One-fifth of respondents said they planned to start a food garden this year and more than half said they already were gardening to save on groceries.

Community gardens nationwide are also seeing a surge of interest. The waiting list at the 312-plot Long Beach Community Garden has nearly quadrupled - and no one is leaving, said Lonnie Brundage, who runs the garden's membership list.

"They're growing for themselves, but you figure if they can use our community garden year-round they can save $2,000 or $3,000 or $4,000 a year," she said. "It doesn't take a lot for it to add up."

Seed companies say this renaissance has rescued their vegetable business after years of drooping sales. Orders for vegetable seeds have skyrocketed, while orders for ornamental flowers are flat or down, said Richard Chamberlin, president of Harris Seeds in Rochester, N.Y.

Business there has increased 40 percent in the last year, with the most growth among vegetables such as peppers, tomatoes and kitchen herbs that can thrive in small urban plots or patio containers, he said. Harris Seeds recently had to reorder pepper and tomato seeds.

"I think if things were fine, you wouldn't see people doing this. They're just too busy," Chamberlin said. "Gardening for most Americans was a dirty word because it meant work and nobody wanted more work - but that's changed."

Harris Seed's Web site now gets 40,000 hits a day.

Among larger companies, Burpee saw a 20 percent spike in sales in the last year and started marketing a kit for first-time gardeners called "The Money Garden." It has sold 15,000 in about two months, said Ball.

A Web-based retailer called MasterGardening.com is selling similar packages, and Park Seed of Greenwood, S.C., is marketing a "Garden for Victory Seed Collection." Slogan: "Win the war in your own backyard against high supermarket prices and nonlocal produce!"

Cultivators with years of experience worry that home gardeners lured by promises of big savings will burn out when they see the amount of labor required to get dollars from their dirt. The average gardener spends nearly five hours a week grubbing in the dirt and often contends with failure early on, said Bruce Butterfield, a spokesman for The National Gardening Association.

"The one thing you don't factor into it is the cost of your time and your labor," he said.

"But even if it's just a couple of tomato plants in a pot, that's worth the price of admission."

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Hakonechloa macra 'Aureola'- 2009 Perennial Plant of the Year

Hakonechloa macra 'Aureola' (golden hakone grass) is the Perennial Plant Association's 2009 Perennial Plant of the Year. This ornamental grass is a member of the Poaceae family. The species is native to Honshu Island, Japan. The genus derives its name from *Hakon,* a region in Japan, and *chloa,* the Greek word for grass.

Golden hakone grass grows 12-18" tall and 18-24" wide with an arching form that resembles a cascading miniature bamboo. Individual blades are ½" wide and bright yellow color with very thin green stripes. In the cooler days of autumn the golden foliage becomes tinged with shades of pink and red. *Hakonechloa* is used mainly for its golden foliage, although it does produce tiny, inconspicuous flower spikes from late summer through mid autumn.

Hardy to zones 5 to 9, golden hakone grass grows best in moist, humus rich, well-drained soil. This grass will not grow well in poorly drained soil, heavy clay soil, or very dry soils. Partial shade is the optimum location in hot climates while more sun is suitable in cooler areas. Deep shade may reduce the golden leaf color. Golden hakone grass spreads by stolons but does so slowly so it is not a threat to other companions. Since golden hakone grass is a slow grower, it will not be necessary to divide for many years. However, if division is desired it should be done in early spring as new growth develops. Nursery propagation is available by division or plugs. This shade tolerant grass has few insect or disease problems and is not favored by deer. This grass requires little maintenance, other then cutting the dead leaves back in late winter or early spring.

Hakonechloa macra 'Aureola' should find a place in many gardens. The combination of golden leaves with green stripes makes it a fantastic companion to hostas. This grass looks especially good with hostas that have a golden edge or have a bluish cast. Combine golden hakone grass with tiarellas that tend to have darker veination in the fall, or any purple or dark leafed plant, particularly heucheras or purple foliage bugbanes *(Actaea* - aka *Cimicifuga.)* Other good companion plants are astilbe, epimedium, wild ginger, bleeding heart and lady's mantle. As a container plant, golden hakone grass adds a lot of charm to any container when it cascades over the sides like a waterfall. It is also especially useful as an edging plant where it can cascade into a path. This ornamental grass is an excellent addition to an Asian-style garden or can be used to provide a somewhat tropical look and feel.

Any area of the garden that is darker and somewhat drab can benefit from golden hakone grass. When planted in mass the entire area glows like thousands of lightning bugs on a dark summer's night. When it is breezy this grass looks like a golden ocean swaying to and fro. For those gardeners who always "go for the gold" this will be a medal winner in the garden.

Water: A Limited Factor to Expansion

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The availability of water is critical when planning for a new or expanded greenhouse facility. Some growers have had to abandon plans or move to a different site because adequate water was not available.

Also affecting the water supply is drought conditions in some areas of the U.S., especially in the Southeast this past year. Restrictions and water laws can also have an impact on production facilities as well as the use of plants by homeowners.

Water usage is affected by many variables. Most important of these is the level of solar radiation within the greenhouse. This varies from a low level during the winter months to two to three times as much during the summer. The design for the water supply has to be made for the peak use time of the year.

There have not been a lot of studies conducted on the water usage of plants. A rule of thumb is to have available 0.3 to 0.4 gallons/square foot of growing area per day as a peak use rate for the warmest day. For example a 30' x 100' greenhouse with 2400 square feet of benches would require a peak use rate of 720 to 960 gallons/day. This corresponds with the evapotranspiration rate for most areas of the country. The following factors can increase or decrease the amount of water needed:

Solar radiation - the level of radiation that reaches the plants is reduced by 10% to 40% due to the glazing and the structural members in the greenhouse. This reduces the transpiration.

Shading - adding shading outside or inside will reduce the radiation level on the plants. Depending on the level of shade, this will reduce evapotranspiration and therefore water needs.

Air movement - Fan ventilation and HAF systems increase the rate of evapotransporation. Depending on location of nearby greenhouses or other buildings, sidewall vents and open-roof designs can also have an influence. A 5 miles/hour breeze can increase evapotranspiration by 20%.

Type and size of the plants - Seedlings or small potted plants require less water than a fullgrown tomato or cucumber crop. A large root mass or heavy leaf canopy will increase water needs.

Type of irrigation system - only 20% of the irrigation water applied with an overhead sprinkler system may reach the soil in a potted plant crop with heavy foliage. On the other hand, all the water applied with an in-pot drip system gets to the soil. Uniformity of watering is usually best with a boom system. Ebb and flood systems, flooded floors and hydroponics conserve water by recycling and reusing the excess water.

Leaching - the recommendation that at least

10% of the water applied be allowed to leach out to remove excess fertilizer salts increases water usage. Often leaching accounts for a much higher percentage and can increase water needs significantly. The type of growing mix used also affects the amount of water holding capacity and therefore the frequency of watering.

Other uses - In addition to plant requirements, water is needed for pesticide application, evaporative cooling, growing media preparation and clean-up. These should be estimated when designing the system.

Water Quality

Municipal system water and deep wells generally provide the best water source for greenhouse operations. Chemical treatment of the water may be required when pollutants, such as iron, sodium, dissolved calcium and magnesium or bicarbonates are present. Surface water such as ponds and streams may have more particulate matter, such as, suspended soil particles, leaves, algae or weeds that needs to be filtered out. A sample from a potential water supply should be sent to an irrigation water testing laboratory to get an analysis.

Water Law

All states have regulations related to water diversion and discharges. Many have restrictions that are put into place when a drought occurs. A permit may be required when water usage exceeds a specified level. For example, in Connecticut, using 50,000 gallons a day from any source triggers whether you have apply for a diversion permit.

Getting a permit is quite involved and takes considerable time and costs significant money. An in depth application document that may cost $50,000 in consultant fees and take a year or more to process is not uncommon. Accurate records of present water usage, the impact of the diversion on the area and the creative use of recycling are important. Complying with the regulations can be an unpleasant experience that you may have to go through.

Extending a limited water supply

Water supplies can be extended by several methods. Most common is adapting low usage irrigation methods. Zoning, applying the water to one area or section of plants at a time, will allow a low flow water source to irrigate a larger number of plants. Zones can be sized to utilize the flow from a well or municipal source so that irrigation takes place all day long.

Low flow wells can be set up to be pumped to a storage tank over many hours. Water from the tank is then used to irrigate plants during the daylight hours. Collection of rainwater to supplement a well or surface system is also possible. This works best with a gutter-connected greenhouse where the water from the downspouts is piped to an above ground or below ground storage tank.

From a conservation standpoint, keeping the piping system in good repair is important. A leak of one drop per second amounts to over 113 gallons per month.

Water is an important component of plant growth. Planning for its supply and use can help to insure that adequate quantities are available to meet plant needs.

What's Wrong With My Crop? - A Diagnostic Checklist

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Causes of plant problems can be grouped into two general categories: biotic and abiotic. Biotic agents are living agents such as insects, mites, nematodes, fungi, bacteria, viruses and other microbes. Abiotic agents are non-living causes such as improper temperature or watering practices, mechanical damage or improper soil fertility or pH. Sometimes abiotic and biotic causes are linked such as overwatering contributing to root rot.

By asking a series of questions and investigating all the possible causes, growers may be able to diagnose the problem themselves or at the very least, provide enough detailed information for a diagnostic laboratory to help.

Is there an actual problem?

The first rule in making a diagnosis is to know your crop and what is normal for that crop. Be familiar with the common characteristics of each species and know the cultural requirements.

For example, the normal foliage die back on a perennial crop can be mistaken for a problem. Plants may also have normal varietal differences such as crinkled or variegated foliage, or variation in flower size that can be confused with abnormal growth if unfamiliar with the variability.

Outline the case history

When were symptoms first noticed? Evaluating the period of decline might help to pinpoint a particular cultural practice or treatment that might be the cause.

Did the symptoms suddenly appear over a couple of days or gradually appear over a period of weeks? Was there a change in the environment that triggered stress? Experienced growers keep records and can look back at the crop history to determine if a cultural practice or environmental condition may have contributed to a crop problem. Biotic causes are rarely associated with a sudden onset of symptoms. They are more likely to appear gradually. Abiotic causes such as improper pesticide applications or air pollutants from a failed heating system, are likely to appear suddenly.

Is there a pattern of abnormal growth within the greenhouse?

The overall observation of a bench of plants or an entire crop or greenhouse is as important as closely examining individual plants. Symptoms occurring uniformly throughout a crop or greenhouse is a clue that the cause is likely abiotic. If symptomatic plants are scattered throughout the greenhouse, then the cause could be either abiotic or biotic. Observe the specific area around injured plants. For example plants might show injury near a blower or heater from hot air, near a vent from cold air, under an area that is dripping condensation from disease, and from pollution by a malfunctioning or unvented heater.

Test for ammonium-N, pH and soluble salts

Always conduct a soil test for ammonium, pH and soluble salts or electrical conductivity (EC) as possible causes and review your fertilizer program. While a test for ammonium would be part of a complete soil test by a soil test lab, pH and EC tests are two, quick tests that can be done by growers or soil test laboratory.

Although symptoms of ammonium toxicity vary among plant species, injury generally begins with yellowing of recently fully expanded leaves followed by leaf burn. Affected leaves may curl upward (petunia) or become irregularly shaped (impatiens). Coleus, cosmos, geranium, petunia, salvia and zinnia are very sensitive. Fertilizers high in ammonium nitrogen, overfertilizing and cool, wet growing media contribute to ammonium toxicity symptoms.

Measuring soluble salts (SS) provides a general indication of nutrient deficiency or excess. Injury caused from excess salts usually appears shortly after transplanting since seedlings are less tolerant than established plants. Some soilless mixes may contain enough "starter charge" to cause excess salts problems in the first few weeks after

transplanting when a water-soluble fertilizer is also applied. Excessive drying, poor drainage, and uneven watering can aggravate the problem. It is difficult to diagnose soluble salts without an EC test. Often nutrient deficiencies and root diseases cause the same symptoms.

Improper pH is another common problem, sometimes due to the choice of growing media or fertilizers for a particular crop. Geraniums and marigolds may show symptoms of iron and manganese toxicity if grown in a media intended for petunias and calibrachoas with low pH (below 5.8) and iron. Learn to recognize iron and manganese toxicity symptoms which appear as faint reddish brown speckling on foliage similar to spider mite damage. Eventually edge burn and yellowing occurs. If the problem is not corrected early in the crop cycle, the crop will likely not recover in time. Petunias will show iron deficiency symptoms (yellowing new growth) if grown in a media intended for geraniums with high pH (above 6.0). Petunias and calibrachoas can usually recover when pH and fertility is adjusted if roots are healthy.

Is your fertilizer injector working properly?

Check your injector system to make sure it is operating accurately. Periodically test the EC of the fertilizer-injected water to test the output of your system. When an injector is not working properly, plants often show overall deficiency symptoms.

Do you use controlled release fertilizer?

If controlled release fertilizer was used, are contents of the fertilizer prills still intact or dissolved? Was the correct application rate used and properly distributed? This information along with a soil test may help to detect nutrition related problems. Fertilizer prills coming in direct contact with roots can cause roots to burn. Once applied, controlled-release fertilizers can't be removed so it is important to choose the proper fertilizer for the crop and use the right rates, applied correctly.

What is the root health?

Along with a soil test, immediately inspect the root health when diagnosing plant problems. Foliar symptoms such as wilting, yellowing, stunting, edge burn, leaf drop or general plant death may be related to unhealthy roots. Inspect root health by removing suspicious plants from containers and check to see whether the root ball is of normal size and color. Look for sections of dark, soft decayed feeder roots along the face of the root ball that would indicate root rot disease or injured roots from high levels of soluble salts. Depending on the extent of the injury and how soon plants were diagnosed and treated, plants may recover. If high soluble salts were the cause, leaching with clear water will be necessary and plants should be carefully monitored for new root growth.

Temperature and light extremes

Depending on the optimum temperature for the crop, cold temperatures can stunt plants and contribute to root rot. Excessively high temperatures can cause scorched leaves. Injury caused by temperature and light extremes often occurs during late spring before shade cloth is used. Hot, bright sunny days following cloudy cool weather can stress sensitive plants resulting in leaf scorch. This type of damage usually occurs suddenly and is uniform on sensitive shade plants such as impatiens.

Are the stems buried?

Check the planting depth if plants were recently transplanted. Some plants will not tolerate their stems being buried and will die. Other plants will tolerate being planted deep and will send out roots along the stem. Experienced growers and trained, supervised staff can help prevent this problem.

Overwatering and oedema

Overwatering can contribute to the physiological disorder oedema. Oedema occurs when the growing media remains moist and the greenhouse air is cool and moist. The plant roots absorb water at a faster rate than is transpired through leaf cells causing the leaf cells to rupture causing raised, bumps or blisters on the undersides of the lower or older leaves. On ivy geraniums the injury resembles spider mite or thrips damage. It also occurs on sweet potato vine (ipomoea), begonias, cacti, ferns, palms, pansy, cleome, cole crop vegetables like broccoli, cabbage and cauliflower and fleshy leaved plants such as jade and peperomia. Severely affected leaves will often turn yellow and fall off the plant. Mildly affected plants often recover from edema, putting out symptomless new growth, with the arrival of more favorable growing conditions in late spring and early summer.

To prevent and manage edema, use well drained growing media, avoid over-fertilizing, increase light intensity by spacing plants farther apart and avoid growing cultivars of ivy geraniums that are highly susceptible. Avoid over-watering, reduce humidity by venting and keep the plants on the dry side

during extended periods of low light and cool temperature.

What pesticides and other chemicals were used during crop production?

Review recent chemical applications including pesticides, growth regulators and surfactants. Symptoms of pesticide or chemical phytotoxicity can appear within hours of treatment or a few days later and sometimes continue to worsen for longer periods of time. Sometimes injured plants are uniform throughout the greenhouse however, different varieties of the same plants can show large differences in sensitivity. Symptoms may appear as brown spotting, yellow mottling, leaf edge burn or yellowing, or bronzing of leaf undersides. Petals, buds and young growth are usually most susceptible to injury. As they grow out and fully expand, they may become distorted. The location of the damage on the plant may indicate that the damage occurred at one point in time. Also, the damage usually reflects the way the spray droplets landed on the leaves. Plants that are mildly injured will usually grow out of it. Watch for healthy new growth that was not sprayed.

Have herbicides been applied around the greenhouse or under the benches?

Herbicide injury may range from twisted, distorted growth to plant death depending on the chemical. This can happen when volatile herbicides are used in a greenhouse, or applied outside the greenhouse and drift in through the vents or roll-up sides. It can also happen if a sprayer used for herbicides is used to apply pesticides to a crop. It has been my experience that plants injured by herbicides rarely recover. Be sure this problem never happens.

Is the heating system working properly?

Air pollution from an unvented or malfunctioning heating system even for a few hours of exposure can devastate a crop. Injury includes leaf distortion, abortion of flower buds, defoliation and chlorosis. This type of injury is usually observed in a pattern.

Summary

Inspect plants regularly to detect, diagnose and take corrective measures as soon as possible. Once you have a clear understanding of the history of the crop, the patterns in the greenhouse and the extent of the problem, you can begin ruling out unlikely causes.

Once the problem is diagnosed and corrective measures are taken, plants may take a long time to recover or may not recover in reasonable time. Look for signs of recovery by inspecting the health of the roots and new growth as it emerges.

Resources for Diagnosing Problems

UMass Extension Plant Diagnostic Laboratory
www.umass.edu/agland/diagnostics

UMass Soil Testing Laboratory www.umass.edu/soiltest

New England Greenhouse Update
http://www.negreenhouseupdate.info/

2009-2010 New England Greenhouse Floriculture Guide
http://www.negreenhouse.org/index.html

University of California IPM online
www.ipm.ucdavis.edu/PMG/selectnewpest.floriculture.html

Penn State University Cooperative Extension Plant Disease Facts
www.ppath.cas.psu.edu/EXTENSION/PLANT_DISEASE/fact.html

Diagnosing Problems Due to Plant Growth Regulators, NC State University
http://www.ces.ncsu.edu/depts/hort/floriculture/crop/crop_PGR.htm

Reduce Air Pollution from Your Heating System
http://www.hort.uconn.edu/IPM/greenhs/htms/reducepoll.htm

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