

Floral Notes *Newsletter*

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January- February 2018

In This Issue

Read about trouble-shooting problems with Calibrachoa, natural greenhouse ventilation authored by John Bartok, a review of PGRs for bedding plants and other spring crops, and a reminder about the 2017 USDA Agriculture Census. Don't forget the 2018 MFGA Winter Meeting February 8, 2018


Save the Date!

2018 NORTHEAST GREENHOUSE CONFERENCE

November 7&8, 2018 • Boxboro Regency Hotel, Boxborough, MA

The biennial Northeast Greenhouse Conference & Expo is co-sponsored by New England Floriculture, Inc. — a group of grower representatives from the Northeast, in collaboration with University and Cooperative Extension staff in each state who specialize in greenhouse crops and management. Don't miss this great opportunity to learn, share and connect with other industry professionals!

- Technical Workshops on CEA Technologies (Plant Factories, LED Lighting, Etc.), Emerging Technologies & Trends, Perennials, Greenhouse Vegetables, Business and Marketing
- Hands-on Training Sessions
- Spanish Language Sessions
- Exciting Keynote Speakers
- Pesticide Credits
- Trade Show and Product Demonstrations
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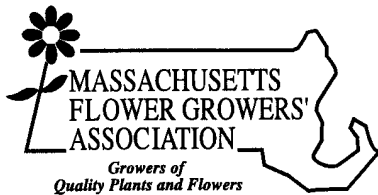
2018 MFGA Winter Meeting

February 8, 2018

King Farm 15 Scales Lane

Townsend, MA

Contact Bob Luczai (781)-275-4811 or Geoffrey Njue (781)891-0650x12 for more information.



Flower Growers Winter Meeting and Education Program Thursday February 8, 2018

King Farm Inc., 15 Scales Lane, Townsend, MA

*Sponsored by the Massachusetts Flower Growers' Association and
University of Massachusetts Extension Greenhouse Crops and Floriculture Program*

Special Feature: Allied Trade Tables

8:30 – 9:50 am Open House at greenhouses

King Farm, www.kingfarminc.com/

The Flower Hutch, www.flowerhutchma.com/, 42 Bayberry Hill Rd. Townsend, MA

9:30 am Registration: Complimentary Coffee

9:50 am Welcome: Bart King- President MFGA, Dana, Barbara and Christy King, King Farm

10:00 am-11:00 10+ Ways to find \$10,000 in business. Erin Pirro, Farm Credit East

Topics will include: How to make your expense dollar go further, Everything's a tradeoff: how do you know it's the right one?, Price taker or profit maker: what's your perspective?, Manage margins crop by crop, Know your costs so you can price appropriately, What's the right amount to grow?, Grow less and charge more, Managing shrink and more.

11:00 – 12:00 A California Spring Trial Tour – Think Spring with Jim Nau, Ball Horticulture

Jim is the Manager of the Gardens at Ball Horticulture, and has been the organizer of the Spring Trials Tour for Ball Horticulture. He will lead us on a Spring Trial Tour and see how the Breeding organizations present their products to Growers and Retailers. He will point out some of the key items introduced in 2017 that you are growing this spring, and maybe we will have a peak at what's coming up for 2018. Everyone on the bus!

12:00- 1:00 Catered Lunch – Reservations requested by Feb 6, 2018

MFGA Annual Meeting- *Bart King, President and Bob Luczai, Secretary MFGA*

1:00 – 2:00 pm Adding Sales Horsepower- Emerging Trends & Concepts

John Johnston, Retail Education Manager for Griffin Greenhouse and Nursery Supply

John has been helping Retailers improve their business bottom line for over 30 years. He will point out some key ideas to improve your retail sales using examples he has seen in his travels around the country as a retail consultant. Some of those examples will include retailers in Massachusetts

2:00 – 3:00pm New Worker Protection regulations and Requirements

Laurie Rocco, Pesticide Inspector, MDAR Crop and Pest Service (1 pesticide credit)

Laurie will discuss the current EPA WPS regulations on the use of respirators including respirator fit test, medical evaluation and other WPS updates. This is part of what is in effect for 2018 to comply with WPS. Also to be discussed is what to expect when having an inspection. Discussion on Storage Recommendations will also be part of the presentation

For more information contact: Bob Luczai, MFGA - 781-275-4811 or Geoffrey Njue 781-891-0650 x12,
UMass Extension Greenhouse Crops and Floriculture Program

<http://www.umass.edu/umext/floriculture/> or <http://www.massflowergrowers.com/>

***Calibrachoa* Troubleshooting**

Calibrachoa are susceptible to several diseases and nutrient disorders during production. Here is a list of common problems to watch for and prevent this growing season.

Root diseases -*Thielaviopsis* (black root rot), *Pythium* (root rot), *Phytophthora* (stem and root rot) – Early symptoms often show up as stunted growth, yellowing and wilting. Regularly monitor plant roots and stems (at base of the plant), from the time plants are plug stage to finishing. Healthy roots are white and firm; decayed roots are dark colored and rotted. Since symptoms can be mistaken for other causes such as high soluble salts, suspicious plants should be diagnosed by a diagnostic lab. Prevent root rot diseases by avoiding re-using containers, trays and growing media and by managing fungus gnats. Maintain a medium pH at 5.5 to prevent *Thielaviopsis*. Fungicides provide healthy plants protection from becoming infected.

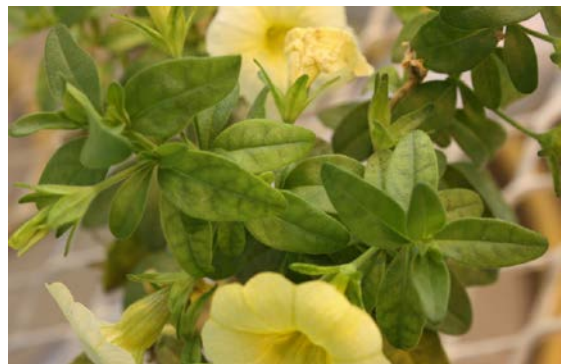
Botrytis cinerea (leaf blight and stem canker) – Branches may wilt as if the plant has root rot, but in fact, they have *Botrytis* stem canker. Pick up the canopy and look for fuzzy spores around the stems. To prevent and manage *botrytis*, water early in the day, so foliage can dry rapidly. Reduce greenhouse humidity by providing adequate ventilation and provide adequate plant spacing for good air circulation. Rotate fungicides with different modes of action groups to delay resistance.



Powdery mildew – Carefully monitor the lower, interior leaves for signs and symptoms of powdery mildew (yellow or brown dying leaves in addition to white, talcum-like fungal growth) to detect an early infection. Manage powdery mildew by reducing greenhouse humidity; providing adequate ventilation; and spacing plants to provide good air circulation. Note that the fungus that causes powdery mildew on cucurbits (pumpkins, squash, melon and cucumber) *Podosphaera xanthii* is also known to infect calibrachoa, verbena and petunia so

avoid growing squash and cucumber transplants in the same greenhouse as susceptible verbena or calibrachoa. Adhere to a strict spray schedule (seven days is recommended), apply fungicides at the full label rate and rotate fungicides with different modes of action.

Iron deficiency – Symptoms appear as interveinal chlorosis, normally starting at the shoot tips, but often occur throughout the entire plant. Sometimes the leaves turn almost white. Prevent Fe deficiency by maintaining a medium pH at 5.5 and if needed, use a petunia fertilizer with added iron or use an iron chelate fertilizer. In addition to pH, cold media (cold roots) or poor root development will affect uptake of iron.



Resources

This Month in diseases: Calibrachoa by A.R. Chase and Margery Daughtrey, June 2011 GPN Magazine.
Squashing Powdery Mildew in Calibrachoa by C. Warfield
Greenhouse Product News 2015 Ornamental Disease Digest (with photos)

Tina Smith, UMass Extension with input from Leanne Pundt, UConn Extension and Angie Madeiras, UMass Extension Plant Diagnostic Lab. March 23, 2016.

What the New Tax Law Means for Northeast Agriculture

Farm Credit East

Overview

The largest overhaul of the U.S. tax code in 30 years provides overall positive benefits to many Northeast farmers. While a major promise of the tax reform movement was to “simplify the tax code,” a great deal of complexity remains. Some of the provisions of the tax law that will affect producers in 2018 are discussed below.

Individual Tax Brackets

One of the key aspects of the new federal tax law was to change some of the individual tax rate brackets and adjust the bracket amounts. While the total number of brackets remains at seven, rather than the four initially proposed, the top rate will fall from 39.6 percent to 37 percent, and the amount of income covered by the lower brackets has been adjusted.

Marginal Tax Rate	Individuals	Married Filing Jointly
10%	Up to \$9,525	Up to \$19,050
12%	\$9,526 to \$38,700	\$19,051 to \$77,400
22%	\$38,701 to \$82,500	\$77,401 to \$165,000
24%	\$82,501 to \$157,500	\$165,001 to \$315,000
32%	\$157,501 to \$200,000	\$315,001 to \$400,000
35%	\$200,001 to \$500,000	\$400,001 to \$600,000
37%	Over \$500,000	Over \$600,000

¹ A chained CPI index will be used for future bracket adjustments

Standard Deduction: The standard deduction for individuals increases to \$12,000 for single filers and \$24,000 for joint filers.

Alternative Minimum Tax (AMT): The AMT remains (for individuals) but the exemption amounts are significantly increased, and will be indexed for inflation.

State and Local Tax Deductions (SALT): The deduction for state and local property and income or sales taxes is limited to \$10,000 annually.

Section 179

Beginning with the 2018 tax year, farmers will now be allowed to immediately write off capital purchases such as breeding livestock, farm equipment and single purpose structures (such as milking parlors) up to \$1

million dollars. The phase out on this expensing provision does not kick in until a farm reaches \$2.5 million in purchases.

Bonus Depreciation

Farmers will now be able to write off 100 percent of qualified property purchased after September 27, 2017 through 2022 (at which point a phase down occurs). In the past, many farms used bonus depreciation on general purpose barns, to receive an additional deduction of 50 percent, that were built since they are classified as “20 year property” and are ineligible for section 179.

The new law expands bonus depreciation to include both new and used property that is purchased or constructed. Additionally, there are related party restrictions included that will limit this provision based on the technical definitions of “related parties” in the tax code.

The 100 percent deduction also applies to plants bearing fruits and nuts that are planted during the year.

Keep In Mind... It is important to note that many states do not conform exactly to the federal bonus and section 179 depreciation provisions. In most cases, depreciation taken at the state level is different than the federal level. For example, a farmer expensing 100 percent of a \$3 million capital purchase with bonus depreciation may not receive that \$3 million dollar deduction at the state level. Rather, the state deduction will incorporate depreciation on those assets over their normal recovery lives and methods.

Farm Equipment

Farm machinery and equipment (other than any grain bin, fence or other land improvement) will be able to be depreciated over five years as long as the original use of the asset begins with the taxpayer.

Like-Kind Exchanges

Like-kind exchanges are limited to real property. For example, farmers can still swap land for other land tax free but trade-ins of equipment will no longer be a tax-free event.

\$25 Million Interest Deduction Limitation

Businesses, including farmers, will now be limited on deducting interest expense when their taxable income exceeds \$25 million. Taxable income is computed with-

out regard to certain adjustments, such as business interest expense and net operating losses. If applicable, the interest deduction cannot be more than the business interest income plus 30 percent of adjusted taxable income. There is an election farmers may consider in order to avoid the limitation.

The only catch, however, is that a slower depreciation method (ADS) will have to be used on farm property with a recovery period of 10 years or more (i.e. greenhouses, milking parlors, barns, etc.) Farmers will be permitted to carry interest forward indefinitely, subject to some pass-through limitations for partnerships.

Corporate Tax Rate

There is now a flat 21 percent corporate tax rate. While many farmers no longer operate in the corporate structure, the remaining ones that are structured as C-corps would typically fall within the 15 percent bracket.

For those farmers, they may want to consider converting to an S-corporation since there would be a tax increase of six percent.

Cash Method Accounting

Farmers with average gross receipts (more than three years) of under \$25 million will be permitted to use the cash method of accounting. Additionally, these taxpayers are not required to account for inventories (however, cash basis taxpayers will not be able to deduct inventory until sold) under section 471. The uniform capitalization rules are also removed for taxpayers under the \$25 million threshold.

Net Operating Losses (NOL)

- The law limits NOLs to 80 percent of taxable income.
- Farmers are permitted a two year NOL carryback.

Domestic Production Activities Deduction (DPAD)

The section 199 Domestic Production Activities Deduction has been repealed. As a result, many cooperatives have decided to accelerate that pass through deduction to patrons before the end of the year.

Estate Tax

The federal estate tax exemption rates will double to \$11.2 million per individual (\$22.4 million for married couples) in 2018. These enhanced amounts will sunset on January 1, 2026.

Cooperatives

Agricultural and horticultural cooperatives will have a new 20 percent deduction available to them to utilize until January 1, 2026. This deduction will be beneficial

for reducing cooperative income. However, unlike the DPAD, this is not directly passed on to patrons but rather taken at the cooperative level.

Non-Corporate Taxpayers

Like cooperatives, non-corporate taxpayers will also get a 20 percent deduction that may be used to offset ordinary income.

An issue of concern... Much like the DPAD that is being repealed, there are limitations associated with the 20 percent deduction such as the amount of wages and unadjusted tax basis the businesses have. These limitations are somewhat complicated and certain provisions remain unclear as to their mechanics. Additionally, the deduction only offsets income tax, not self-employment tax. One of the concerns with the deduction is that it may be of little use to dairy farmers who cull cows since any capital gain sales (i.e. raised cows) limits the impact of the deduction.

Breweries, Distilleries and Wineries

Alcohol manufacturers will enjoy a reduction in excise tax for the next two years. The new legislation also excludes the aging periods for beer, wine and spirits from the production period with regard to the UNICAP interest capitalization rules thereby allowing deductions over a quicker timeframe.

The credit against the wine excise tax was also expanded. Sparkling wine producers are included.

The Affordable Care Act (ACA)

Despite a great deal of press coverage, the Affordable Care Act has not, in fact, been repealed with the new tax provisions. While the individual health insurance mandate technically remains, the penalty has been reduced to \$0, effectively rendering it moot. However, other aspects of the ACA, including the employer mandate, remain in place as before.

Contributors *Dario Arezzo, Tax Consultant; Joseph Baldwin, Financial Services Leader; Paul VanDenburgh, Tax Specialist; Christopher Laughton, Director of Knowledge Exchange*

More information can be found at FarmCreditEast.com

Disclaimer: The information in this report has been compiled from sources believed to be reliable. This is provided for general information purposes only and is not market advice. Farm Credit East makes no representation or warranty regarding the content presented.

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Review of PGRs for Height Control of Spring Crops

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Spring greenhouse crop growers often look for a way to control the height or size of their plants. Plant height can be controlled by chemical PGRs, DIF or DIP methods of temperature control, pruning or shearing, low phosphorus fertilization, controlled irrigation, and careful variety selection and scheduling. The most reliable methods for growth control are chemical PGRs, the subject of this article, and DIF or DIP.

Chemical plant growth retardants (PGRs) are very useful tools for controlling the height of bedding plants and despite the current aversion to chemicals, PGRs remain the first choice of most growers. This article outlines what chemicals are available for spring crops, how they are applied, and some of the factors which affect the success of their use. For more information consult the growth regulator section of the *2017-2018 New England Greenhouse Floriculture Guide*.

Causes of Too Tall Plants

Achieving desirable plant height involves considering why plants tend to be too tall before starting on a PGR program. Spending the time and expense required to apply a PGR may not be necessary if the height problem can be corrected in other ways. There are number of reasons why bedding plants may stretch. The most common reasons for stretching are low light, too close spacing, and situations where there is a large difference between day and night temperature. Plants that are shaded by old plastic, neighboring plants, or hanging baskets tend to stretch. Lack of ventilation on clear days and resulting heating will increase the difference between the day and night temperature and cause plants to grow taller. Excessive height may also result if the plants were started too soon or tall cultivars were chosen instead of compact ones. Many of the factors interact to encourage development of tall plants (e.g., low light and poor ventilation).

PGRs may be helpful in overcoming some of these problems, but too much reliance on PGRs is potentially costly. PGR use should be a proactive rather than reactive part of growing plants. Also, because PGRs are treated as pesticides and have assigned re-entry intervals, frequent use of PGRs may disrupt other work in some greenhouse operations. Like pesticides, PGRs need to be used wisely and not as substitutes for good cultural practices.

Growth Retardants for Bedding Plants

Plant growth regulators are most effective when applied at the appropriate times to regulate plant growth or development. Growth retardants cannot shrink overgrown plants. They must be applied before the plant is overgrown to prevent plant stretch. When planning PGRs in your production schedule, consider what you want to accomplish with the treatment. Table 1 shows the active chemical ingredients and the brand-names of current PGRs for bedding plants and other spring crops. PGRs for height control are "antigibberellins" which act by reducing the production of gibberellins in the plant thus inhibiting cell elongation and shortening the stem internodes.

Table 1. PGRs for spring crops.

Ancymidol	Diaminozide	Flurprimidol
Abide	B-Nine	Topflor (liquid)
A-Rest	Dazide	Topflor (granular)
Chlormequat chloride	Paclobutrazol	Uniconazole-p
Citadel	Bonzi	Concise
Cycocel	Downsize	Sumagic
	Florazol	
	Paczol	
	Piccolo	

Research has shown that when different products with the same active ingredient are applied at the same time, level, and application method the same plant response will result. Table 2 shows the best application method and the level chemical activity and duration of some PGRs.

Table 2. PGR application method and activity

Active ingredient	PGR example	Method	Activity
Ancymidol	A-Rest	Spray or drench	Moderate
Diaminozide	B-Nine	Spray	Low
Paclobutrazol	Bonzi	Spray or drench	High
Chlormequat chloride	Cycocel	Spray	Low
Uniconazole	Sumagic	Spray or drench	High
Flurprimidol	Topflor	Spray or drench	Moderate

A foliar spray is the preferred method of applying PGRs to bedding plants in flats and plug trays and growth medium drenches can be used on pots. Drench applications of B-Nine have no effect on plants and Cycocel drench is less effective than a foliar spray. Sumagic can be applied as a pre-plant spray made to the surface of the growth medium. This may be a more efficient way of applying PGR, if applied uniformly.

The term "activity" refers to the general sensitivity of plants to the PGR and the duration of the growth inhibiting effect after application. The height of plants treated with low activity PGRs is less affected by variations in the spray or drench volume and the persistence of the growth inhibiting effect after application is short (2-3 weeks). Plants are very sensitive to high activity PGRs. Small variations in spray or drench volume can have significant effects on height. The growth inhibiting effect after application, especially by drench, is very persistent. What this all means is that the risk of overdosing is greater with Bonzi and Sumagic than A-Rest, B-Nine, or Cycocel. More attention to details of rate, application volume, timing, and possible reapplication is required to successfully use high activity PGRs.

PGR Rates to Use

To choose a rate (ppm) to apply, check the label for the recommended rate for the plant you wish to treat or consult a crop production guide such as the *New England Greenhouse Floriculture Guide*. In the absence of a specific recommendation the grower should run a trial. A trial should be replicated and consist of a small number of plants rather than whole crop! The general rates commonly used for

cellpacks, pots or other containers (Table 3) are the starting point for a trial.

Table 3. PGRs for cell packs and pots.

PGR example	Rates (ppm) & Methods	Uses & Precautions
A-Rest	6-66, spray 1-4, drench	15 ppm for spray trials, 1 ppm drench for trials.
B-Nine	2500-5000, spray	Repeat apps. On some species. Two apps. At ½ to ¾ label rates may be better than the full rate. Apply during cloudy weather or late in the day.
Bonzi	5-90, spray 0.5-1, drench	15 ppm for spray trials. Apply to stems. For most vigorous species, but not begonia or annual vinca.
Cycocel	800-1500, spray	1250 for trial. 800-1500 ppm for most species but as 300 may be needed. No more than 6 apps. Per crop cycle.
Sumagic	1-50, spray 0-1.2 drench 0.5-2, preplant soil spray	5-15 ppm for spray trials. For most vigorous species, but not begonia. Apply PSS right before transplanting while mix is moist. 2 qt./100 sq. ft.
Topflor	0.5-80, spray 0.25-4, drench	Test at low rates. Repeat apps. May be needed at 21 day intervals.

PGR Response to Environmental and Situational Factors

Applying PGRs

Environmental and situational factors affect the response of plants to PGRs. PGRs are most effective when applied under conditions of high humidity, cool temperatures, minimal air movement, and low light. Especially for sprays, these conditions slow evaporation of PGR solution from the leaves. Apply on cloudy days.

The rate of PGR to use depends on a number of factors. High PGR rates would be used when growing temperature, light, and vigor of plant are high, spacing is close, application is late, or when other ways of reducing growth (e.g., DIF, DIP, low P,) are in use. Low rates would be used when opposite conditions are true. Other factors like fertility level, EC, and irrigation practices may affect the choice of a PGR rate. If one of these factors encourages growth more PGR may be needed or if one of these factors causes plant stress or in some manner holds back plant growth a lower PGR rate would be best.

Normally PGRs are applied early in the growth of bedding plants and seedlings. Timing is related to stage of plant development and not weeks from seeding or transplanting. Timing can be fairly specific for some species and the product label or other reference should be checked. In general plugs are treated when they have developed their first set of true leaves. Young plants are generally treated after transplanting when they begin to grow or when they are 2" tall or 2" wide.

PGRs must be applied uniformly to result in uniform inhibition to plant growth. For bedding plants in cell packs, PGRs are applied by foliar spray application at low rates; drench application is mostly used for bedding plants in pots and hanging baskets.

Success with Spray Applications

- Always apply sprays to recently watered plants.
- Don't use a wetting agent unless recommended to by the label.
- Don't water from overhead until the PGR dries.
- The most uniform response results from multiple applications at low rates.

- Apply sprays at a consistent volume per 100 ft² based on product label (2-3 qt.).

Success with Drench Applications

- Plants with good root systems and no water stress are best for drenching. A poor root system may limit the uptake of chemical.
- Apply a consistent volume of drench to each pot based on diameter and product label instructions. Drench solution should be applied so each plant is treated equally and the resulting growth inhibition will be the same.
- Drenches should be applied uniformly to the surface to evenly moisten the medium. Drench volume depends on size of pot (see product label or NE Guide).
- Uniform drench application is most important for large containers for multiple plants.

PGRs and Mixed Containers

PGR use is a special challenge when containers contain multiple plants with different levels of vigor. Prior to planting treat plug trays with a liner dip lasting 5 to 30 minutes to allow the plugs to absorb the chemical. For the liner dip the best chemicals are those which can be applied by drench. Spray treatments can be done two different ways: plant the variety to be treated in the final container, spray, and later plant the untreated species in the final container or grow the species to be treated in small pots, spray, and then add to the final container closer to finish. Recommended liner dips are Bonzi at 4-16 ppm, Sumagic at 2-8 ppm, or Topflor at 3-12 ppm.

“Holding” Plants in Spring Prior to Sale

Great spring weather can cause some plants to grow too well. PGRs can't make tall plants short, only cutting back can, but PGRs can be used to "hold" the plants. The best way is to apply PGR foliar sprays, rather than a drench, because sprays have a shorter residual life. Apply these sprays at the high end of the normal concentration range. Do not drench or use excessive spray rates; the risk is that the growth suppression will carry over into the landscape. Do not use Cycocel because of the risk of phytotoxicity.

Correcting Overapplication of a PGR

Causes of PGR overdose include excess rate, mistakes in preparation, or overspray. Of course, careful application of antigibberellin PGRs at the start is the best way of avoiding overdose. However, overdosed plants will begin to grow when sprays of gibberellin-containing PGRs like Fascination and ProGibb are applied. Use low concentrations of Fascination at 2-5 ppm or ProGibb 4% at 1-2 ppm weekly until growth stimulation is satisfactory. Be careful, higher rates of gibberellins may stimulate growth so much that the final quality of the plants will be reduced to the same degree as plants overdosed with antigibberellin PGRs alone.

References

2017-2018 New England Greenhouse Floriculture Guide. New England Floriculture, Inc.
Michigan State Univ. Plant Growth Regulator Website. flor.hrt.msu.edu/PGRs/

Natural Ventilation Guidelines

John W. Bartok, Jr.
Extension Professor Emeritus
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Natural ventilation is more common today in new greenhouse construction and in retrofits of existing greenhouses. This is due to increasing electricity cost for fan operation and the desire for more uniform cooling in the crop area.

Natural ventilation systems operate on the principle that heat is removed by a pressure difference created by wind and temperature gradients. Wind plays the major role. For a well-designed greenhouse, wind speeds of 1 mile/hour are adequate to keep the inside temperature within two degrees of outdoor ambient. Weather records show that there are very few days that the wind is less than 1 mph, especially if the outdoor temperature is above 80F.

Buoyancy, the effect from air getting lighter as it is heated also aids ventilation. The greater the temperature difference between inside and outside results in greater air movement.

Natural ventilation systems do not work well where evaporative cooling is needed as the heat and high humidity air created is easier to remove by positive air movement. Also insect screening cannot be used with natural ventilation as not enough air can get through the screen material.

The following are things to consider when remodeling or building a greenhouse with natural ventilation:

Size of the vents – American Society of Agricultural and Biological Engineers standards recommend that the combined roof vent area should equal the combined sidewall vent area and each should be at least 15 to 20% of the floor area. For northern climates 15% may be enough but greater amounts are needed in warmer climates. Research by G.P.A. Bot in the Netherlands showed that having sidewall vents in a single or double span house quadrupled the ventilation rate as compared to just roof vents. In large size gutter-connected greenhouses where sidewall vent area per floor area decreases as the width increases, larger roof vents are needed. Open roof designs may eliminate the need for sidewall/endwall vents where more than 50% of the roof is open.

Vent location – The typical location is to have roof vents hinged on both sides of the ridge. This allows operation so that the leeward vents can be opened to create a vacuum at the top of the ridge. Gutter vents have not worked well as the vacuum is not as strong and they can be inoperable when snow fills the gutter. Sidewall vents are usually located at bench height. This works well to cool plant foliage but is affected by how plant vegetation is orientated adjacent to the wall. It can also have an effect on the plants if the vents are opened during cool weather. Some growers install the vents higher up the wall and allow mixing of the outside and inside air before it reaches the plants. This intercepts wind having a higher

velocity. The installation of guillotine vents has eliminated the problem of the rack and pinion system interfering with the plant growing area. With gutter-connected greenhouses, roof vents are more important than side vents.

Greenhouse height – The trend toward taller greenhouses has helped ventilation in that it increases the buoyancy effect and gets the hot air higher above the plants. It also provides buffering of the air and reduces quick changes in temperature. The standard gutter height is now about 14’ and taller greenhouses are used for some crops. This also allows space for energy/shade screens, tall crops such as tomatoes and cucumbers and multiple layers of hanging baskets.

Orientation of the greenhouse – Where possible, the greenhouse should be orientated to intercept the normal summer wind along the sidewall. A check with the local weather station can provide this. Also, trees, greenhouses and buildings should not obstruct the natural air flow.

Operation – Horizontal Air Flow (HAF) fans should not operate when natural ventilation is being used as it may counteract the ventilation air flow. Controls should be installed to give high wind and rain protection. Seals around vents should be checked before the winter heating season to reduce infiltration.

THE CENSUS OF AGRICULTURE IS A PRODUCER’S VOICE, FUTURE, AND OPPORTUNITY

In December farmers and ranchers across the nation received the 2017 Census of Agriculture. Producers can mail in their completed census form, or respond online via the improved web questionnaire. The online questionnaire has been revised extensively to make it more convenient for producers. Conducted once every five years, the census of agriculture is a complete count of all U.S. farms, ranches, and those who operate them; it is the only source of uniform, comprehensive, and impartial agriculture data for every state and county in the nation. Farmers and ranchers, trade associations, government, extension educators, researchers, and many others rely on census of agriculture data when making decisions that shape American agriculture – from creating and funding farm programs to boosting services for communities and the industry. The census of agriculture is a producer’s voice, future, and opportunity. For more information about the 2017 Census of Agriculture, visit www.agcensus.usda.gov or call 1-800-727-9540.

