### **Default Question Block**

As part of our Northeast SARE project "Improving nutrient and pest management in high tunnel production", we want to learn more about the practices you use and the challenges you face in your high tunnels. We plan to compare the results from this survey to one we did three years ago, at the start of the project.

Your responses will help us design our research & outreach programs to provide the best resources for improving nutrient and pest management in high tunnels. All responses will be kept confidential, and we greatly appreciate your time and input.

This survey may take 10-15 minutes of your time. As incentive for filling out the survey, you'll have the opportunity to be entered into a raffle to win some fabulous prizes: \*\*FREE REGISTRATION\*\* to the next High Tunnel Conference, a brand new copy of The Greenhouse & Hoophouse Growers' Handbook, or a gift certificate for free high tunnel soil tests.

- Becky Sideman and Heather Bryant University of New Hampshire Extension
- Mark Hutton and Bruce Hoskins University of Maine Extension
- Margaret Skinner and Cheryl Frank Sullivan University of Vermont
- Eric Sideman Maine Organic Farmers & Gardeners Association
- John Spargo Pennsylvania State University



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Department of Agriculture and N.H. counties cooperating.

During the past four years, in which of the following project activities have you participated?

As a reminder, the main project team consists of Margaret Skinner & Cheryl Frank Sullivan (UVM), Becky Sideman & Heather Bryant (UNH), Bruce Hoskins & Mark Hutton (UMaine)

and Eric Sideman (MOFGA).	
2016 High Tunnel Conference in Manchester NH	
2018 High Tunnel Conference in Manchester NH	
Farmer-to-Farmer Roundtable Discussions on High Tunnel Growing (Edgewater Farm in NH, Johnny's Selected Seeds in ME)	
Twilight Meetings focused on High Tunnel Production & Research (several locations)	
Worked directly with project team member to solve a problem on your farm	
Watched a webinette or read a research report related to high tunnel IPM or nutrient management	
Attended a presentation by a project team member related to high tunnel IPM or nutrient management	
None of these	
Other (please specify):	
Did you make any changes to your farming operation based on things you learned at project activities?	
○ Yes	
○ No	
Please describe any changes you made (optional):	

For the purposes of this survey, the term "high tunnels" will be defined as a polyethylenecovered structure with or without heating, electricity or mechanical ventilation.

Do you currently grow crops in high tunnels?

○ Yes
○ No
How would you describe yourself? Please check all that apply.
Commercial grower
Home gardener
Agricultural service provider (e.g. Extension, NRCS, etc.)
Researcher or educator
In which state are your high tunnel(s) located? Please check all that apply.
☐ Maine
New Hampshire  Vermont
Massachusetts
Rhode Island
Connecticut
New York
Other (please write in 2-letter state code)
General High Tunnel Production Questions
How much of your high tunnel production is certified organic?
None
Some (specify percentage):
○ All
How many high tunnels do you currently use for crop production?

What is the total number of production?	·		e that you use fo	or crop
Please write in square foo	otage, or check	range below:		
less than 1,000 square f	eet			
1-10,000 square feet				
10-25,000 square feet				
More than 25,000 square	e feet			
	If possible, write i	n actual square foota	age:	
			( ) ( O DI	
Which crops do you grow apply.	' in high tunnels	, and at what time	(s) of year? Plea	ise check all that
αρριγ.				
	Spring	Summer	Fall	Winter
Tomato				
Pepper				
Greens (spinach, lettuce, etc.)				
Cucumber				
Eggplant				
Cut flowers				
Herbs				
Vegetable transplants				
Ornamentals				
Raspberry				
Strawberry				
Other (please specify):				
Other (please specify):				
Other (please specify):				
Other (please specify):				
Other (please specify):				

Summer

Fall

Winter

## **Pest & Disease Management Questions**

## **High Tunnel Pest & Disease Management Questions**

Which of the following pest and disease problems have you experienced in your high tunnel production?

	None	Mild	Moderate	Severe	Don't Know
Aphids				$\bigcirc$	
Two-Spotted Spider Mite	$\bigcirc$	$\bigcirc$	$\bigcirc$	$\bigcirc$	$\bigcirc$
Broad Mite					
Russet Mite					
Thrips					
Whiteflies					
Tomato Hornworm					
	None	Mild	Moderate	Severe	Don't Know
Yellow-Striped Armyworm	$\bigcirc$		$\bigcirc$	$\bigcirc$	$\bigcirc$
Spotted Wing Drosophila	$\bigcirc$	$\bigcirc$	$\bigcirc$	$\bigcirc$	$\bigcirc$
Striped Cucumber Beetle	$\bigcirc$	$\bigcirc$	$\bigcirc$	$\bigcirc$	$\bigcirc$
Other insect/arthropods (please specify):	0	$\bigcirc$	$\circ$	$\bigcirc$	$\circ$
Other insect/arthropods (please specify):	0	$\bigcirc$	$\circ$	$\bigcirc$	0
Tomato leaf mold (Fulvia)	$\circ$	$\bigcirc$	$\bigcirc$	$\bigcirc$	$\bigcirc$
Powdery mildew					
	None	Mild	Moderate	Severe	Don't Know

In the past year, how often did you apply the following types of pesticides in at least one high tunnel?

**Restricted use pesticides** can only be purchased and used by licensed pesticide applicators, and **general use pesticides** can be purchased and used by non-licensed applicators and the general public.

	Never	1-3 times	4-9 times	more than 10 times
Insecticide - general use	$\bigcirc$	$\bigcirc$	$\bigcirc$	$\bigcirc$
Fungicide - general use	$\bigcirc$	$\bigcirc$	$\bigcirc$	
Herbicide - general use			$\bigcirc$	
Insecticide - restricted use	$\bigcirc$	$\bigcirc$	$\bigcirc$	$\bigcirc$
Fungicide - restricted use	$\bigcirc$	$\bigcirc$	$\bigcirc$	
Herbicide - restricted use	$\bigcirc$	$\bigcirc$	$\bigcirc$	$\bigcirc$

Unidentified but recurring problem

Which of the following pest or disease management practices do you use in your high

tunı	nels? Please check all that apply.
	Routine scouting
	Use of sticky cards
	Pest/disease identification by farm staff
	Pest/disease identification by Extension specialist or commercial scout
	Plant disease (pathogen) test kits (such as immunostrips)
	Biorational pesticides (such as soap, oil, potassium bicarbonate, etc.)
	Microbial insecticides (such as Bt, insect-killing fungi, etc.)
	Microbial disease control products (such as Trichoderma, Bacillus, etc.)
	Pesticides with low toxicity to non-target organisms
	Preventative pesticide treatments
	Spot pesticide treatments
	Predators (such as lady beetles, predatory mites, etc.)
	Parasites (such as parasitic wasps or flies, etc.)
	Beneficial nematodes
	Indicator or trap plants (such as marigolds for thrips, beans for spider mites)
	Aphid banker plants
	Habitat or guardian plants (flowering plants to attract beneficials)
	Resistant or less susceptible crop varieties
	Good airflow and ventilation
	Screening vents to exclude pests
	Weed-free environment
	Sanitize soil or use new media
	Crop rotation
	Fallow periods between crops
	Other (please specify):
	Other (please specify):

How much do you agree with each of the following statements about **biological control** agents of insect pests (parasites, predators, nematodes, etc.)?

Agree Strongly Agree Somewhat Don't know/ Neutral Disagree Somewhat Disagree Strongly

	Agree Strongly	Agree Somewhat	Don't know/ Neutral	Disagree Somewhat	Disagree Strongly
Biological controls are effective and reliable	$\bigcirc$	$\bigcirc$	$\bigcirc$	$\bigcirc$	$\bigcirc$
Biological controls have a good shelf life	$\bigcirc$	$\bigcirc$	$\bigcirc$	$\bigcirc$	$\bigcirc$
I have a good supplier for biological controls	$\bigcirc$	$\bigcirc$	$\bigcirc$	$\bigcirc$	$\bigcirc$
Biological controls are too expensive	$\bigcirc$	$\bigcirc$	$\bigcirc$	$\bigcirc$	$\bigcirc$
I need to know more about how or when to use biological controls	$\bigcirc$	$\bigcirc$	$\circ$	0	$\bigcirc$
	Agree Strongly	Agree Somewhat	Don't know/ Neutral	Disagree Somewhat	Disagree Strongly
Customers like the idea that I am using biological controls	$\bigcirc$	$\bigcirc$	0	0	$\bigcirc$
Biocontrols are not compatible with chemical pesticides	$\bigcirc$	$\circ$	0	0	$\bigcirc$
Customers have low tolerance for damage or pests on produce	$\bigcirc$	$\circ$	$\bigcirc$	0	$\bigcirc$
Biocontrol agents are not readily available	$\bigcirc$	$\bigcirc$	$\bigcirc$	$\bigcirc$	$\bigcirc$
Consumers do not want chemical pesticides on the produce or plants they buy	0		0	0	$\bigcirc$

What resources or information would help you to improve your management of **insect and disease pests** in high tunnels?

	Not needed	Somewhat helpful	Very helpful
Biological control guidelines for high tunnels in our region			$\bigcirc$
Scouting methods for specific pests	$\bigcirc$		$\bigcirc$
Identification tools for diseases and pests	$\bigcirc$		$\bigcirc$
Pest and disease identification service	$\bigcirc$	$\circ$	$\bigcirc$

	Not needed	Somewhat helpful	Very helpful
	Not needed	Somewhat helpful	Very helpful
Information on pesticide/biocontrol compatibility			$\bigcirc$
Lists of pest-resistant plant varieties	$\bigcirc$		$\bigcirc$
Pest/disease biology			
Spray application methods	$\bigcirc$		$\bigcirc$
	Not needed	Somewhat helpful	Very helpful
Degree-day monitoring information	$\bigcirc$		$\bigcirc$
Action thresholds (when to act)	$\bigcirc$		$\bigcirc$
Cost/benefit analyses		$\bigcirc$	
Web-based pest management information	$\bigcirc$		$\circ$

## **Fertility and Crop Management Questions**

## **High Tunnel Fertility & Crop Management Questions**

How often do you use each of the following **nutrient management practices** in your high tunnel(s)?

	More than once per year	Once per year	Every other year	Once every 3 or more years	Never
Field soil test				$\bigcirc$	
Soluble salts test				$\bigcirc$	
Saturated media extract (SME) test	$\bigcirc$	$\bigcirc$	$\bigcirc$	$\bigcirc$	$\bigcirc$
Plant leaf tissue analysis	$\circ$	$\bigcirc$	$\circ$	$\bigcirc$	$\bigcirc$
Petiole sap testing		$\bigcirc$		$\bigcirc$	
Removing plastic covering to leach salts from soil	0	0	0	0	$\bigcirc$

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	More than once per year	Once per year	Every other year	Once every 3 or more years	Never
Irrigation to leach salts from soil	$\bigcirc$	$\bigcirc$	$\bigcirc$	$\bigcirc$	$\bigcirc$
Re-mix beds before planting each crop	$\bigcirc$	$\bigcirc$	$\bigcirc$	$\bigcirc$	$\bigcirc$
Other (please specify):	$\bigcirc$	$\bigcirc$	0	$\bigcirc$	$\bigcirc$
Other (please specify):	$\circ$	$\bigcirc$	0	$\bigcirc$	$\bigcirc$
	More than once per year	Once per year	Every other year	Once every 3 or more years	Never

## Which sources of fertility do you use in your high tunnel(s)?

	None	A little	Mostly	Entirely
Synthetic granular fertilizers (e.g. 10-10-10, etc.)				$\circ$
Synthetic soluble fertilizers (e.g. 15-5-15 Ca Mg, etc.)				$\circ$
Organic fertilizers (e.g. 5-3-4, soybean meal, sul-po-mag, etc.)				$\circ$
Organic liquid fertilizers (e.g. fish emulsion, seaweed emulsion, etc.)				$\circ$
Compost made on-farm	$\bigcirc$			
	None	A little	Mostly	Entirely
Compost made off-farm	$\bigcirc$		$\bigcirc$	
Animal manures	$\bigcirc$			
Other (please specify):	$\circ$	$\circ$	$\circ$	$\circ$
Other (please specify):	$\bigcirc$			$\circ$

# **High Tunnel Tomato Crop Management Questions**

## **HighTunnel Tomato Management Questions**

Which of the following state	ments a	apply to	your <b>h</b>	nigh tuni	nel tomat	to production?	Check all
that apply.							
Plants are grown in the soil (or in-ground)  Plants are grown in containers or bags  Some or all fertilizers are applied before planting  Some or all fertilizers are applied through irrigation (fertigated)  Some or all fertilizers are applied in side-dress applications during the season  Irrigation is done by hand-watering, or overhead application  Irrigation is done using drip irrigation or emitters  Irrigation is scheduled with a timer  Irrigation is determined by the feel of soil/media  Irrigation is guided by the use of a tensiometer or other soil moisture meter							
Of all the high tunnel tomato categories?	oes that None	les	ow, wh		ortion fall	into each of the more than 75%	ne following All
Heirloom varieties		_		20		()	
Modern field varieties	$\bigcirc$				$\bigcirc$	$\bigcirc$	$\bigcirc$
Modern greenhouse varieties	$\circ$		$\bigcirc$		$\bigcirc$	$\circ$	$\circ$
Indeterminate varieties					$\bigcirc$		
Cherry tomato varieties					$\bigcirc$		
Grafted tomatoes (any variety)	0		$\bigcirc$		$\circ$	$\circ$	$\bigcirc$
Which of the following <b>FRUIT problems</b> have you experienced in your high tunnel tomato production?							
	How often has this happened? When it occurred, do you think that it reduced marketable yields?						
	Never	Some	Most	Always	Y	es es	No

Yellow shoulders

Internal white tissue

	How often has this happened?				When it occurred, do you think that it reduced marketable yields?	
	Never	Some years	Most years	Always	Yes	No
Uneven ripening	0	0	$\bigcirc$	0	0	$\bigcirc$
Blossom end rot						
Fruit cracking						
Insect damage to fruit		$\bigcirc$				
Other (please specify):	0	$\bigcirc$	$\bigcirc$	$\bigcirc$		$\bigcirc$
Other (please specify):	0	$\bigcirc$	$\bigcirc$	$\bigcirc$		$\bigcirc$

Which of the following **PLANT GROWTH problems** have you experienced in your high tunnel tomato production?

	How often has this happened?			opened?	When it occurred, do you think that it reduced marketable yields?	
	Never	Some years	Most years	Always	Yes	No
Lack of vigor	0	$\bigcirc$	$\bigcirc$	$\bigcirc$	0	$\bigcirc$
Too much vigor	0					
Leaves off-color	0					
Documented nutrient deficiencies		$\bigcirc$	$\bigcirc$	$\bigcirc$		$\bigcirc$
Poor fruit set	0					
Fruit drop	0					
Poor yields						
Foliar or leaf diseases	0					
Soilborne or root diseases	0					
Other (please specify):		$\bigcirc$		$\bigcirc$	0	$\bigcirc$
Other (please specify):		$\bigcirc$	$\bigcirc$	$\bigcirc$		$\bigcirc$
	Never	Some years	Most years	Always	Yes	No

How much do you agree with each of the following statements about your **high tunnel** tomato fertilization and irrigation program(s)?

	Agree Strongly	Agree Somewhat	Don't Know/ Neutral	Disagree Somewhat	Disagree Strongly
My fertilization plan results in high yields	$\bigcirc$	$\bigcirc$	$\bigcirc$	$\bigcirc$	
My fertilization plan results in high quality fruit	$\circ$	$\circ$	$\circ$	0	$\bigcirc$
My fertilization plan meets the plants' nutrient needs	$\circ$	$\circ$	$\circ$	0	$\bigcirc$
My fertilization plan is easy to implement		$\bigcirc$	$\bigcirc$	$\bigcirc$	
Only the amount of nutrients needed is applied	$\bigcirc$	$\circ$	$\bigcirc$	0	$\bigcirc$
Soluble salts have increased over time in my tunnel	$\bigcirc$	$\circ$	$\circ$	0	$\bigcirc$
It is hard to find the fertilizers that I want to use	$\bigcirc$	$\circ$	$\circ$	0	$\bigcirc$
I feel confident in calculating fertilizer rates	$\bigcirc$	$\circ$	$\circ$	$\circ$	$\bigcirc$
My irrigation methods result in high yields	$\bigcirc$	$\bigcirc$	$\circ$	$\bigcirc$	
My irrigation methods result in high quality fruit	$\bigcirc$	$\circ$	$\bigcirc$	$\circ$	$\bigcirc$
My irrigation methods are easy to use	$\circ$	$\bigcirc$	$\bigcirc$	$\circ$	$\bigcirc$

Last year, what was your **average total yield (pounds of marketable fruit per plant)** from your high tunnel tomatoes?

$\bigcup$	below	5	lbs	per	plant

- 6-10 lbs per plant
- 11-15 lbs per plant
- 16-20 lbs per plant
- over 20 lbs per plant
- O I don't know

What information or resources would help you improve your crop fertility management in your high tunnels?

	Not needed	Somewhat helpful	Very helpful				
Information on how to interpret high tunnel soil tests							
Local guidelines for high tunnel fertility management							
Guidelines for use of specific sources of fertility (e.g. composts)							
Strategies to manage soluble salts levels in high tunnels							
Information on how to identify nutrient deficiencies							
Information on managing irrigation	$\bigcirc$	$\bigcirc$	$\bigcirc$				
Other (please specify):		$\bigcirc$					
Other (please specify):			$\bigcirc$				
	Not needed	Somewhat helpful	Very helpful				
diseases and crop and (Check all that apply)  Written fact sheets (a	I soil fertility, what way(s	ould help you improve hos) would you want to acce					
	research or farm sites						
Workshops and conferences  Full-length webinars (typically 30m-1hr)							
Short instructional videos or "webinettes" (5-10 minutes max)							
Other (please specify):							

We plan to make the High Tunnel Conference, first run in 2016, an ongoing event held every other year. If you have suggestions for topics and/or speakers for the 2020 High Tunnel conference please list them below.
Lastly, do you have any additional thoughts on how we can help you with your high tunnel production?
Block 4
Thank you for your time and input! Would you like to be entered into the raffle to win a prize?
<ul><li>✓ Yes</li><li>✓ No</li></ul>
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