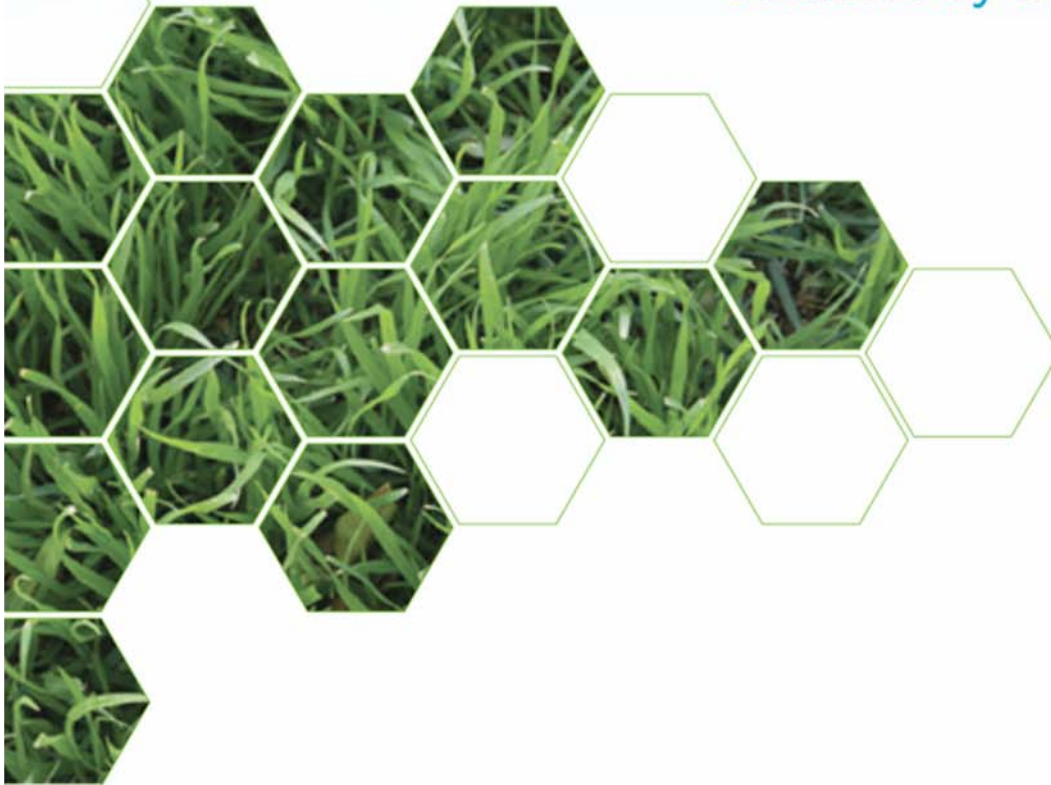




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## **Markham Pesticide By-Law “GRUBS & CHINCH BUGS”**

**Frank Reddick P. Ag.**

**866.345.8873**

**turflogic.ca**



## Lawn Industry Focus has Become

- High Nitrogen
- High water requirements
  - Quick fix
- Pest extermination (weeds, insects, etc)
  - “Treat the symptom”
- No turf agronomic practices



## NEW APPROACH

Prevent or Treat the Problem

Not Just Treat the Symptom





## Steps to a healthy natural lawn

- Aerate yearly – core aggressively
- Overseed yearly with premium 3-way seed
- Mow properly – high, 1/3 rule, sharp blade
- Water correctly – seldom and deeply
- Add compost to raise Organic Matter
- Soil test every 3 years
- Apply 100% organic/natural fertilizer – correct ratio and timing



## What Fertility does the Lawn Need?

- 35N-12P-35K-8Ca-4Mg-4S (lb/Ton grass clippings)
- N:K = 1:1
- Kentucky Blue Grass – 5 lb N/season
- Perennial Ryegrass – 7 lb N
- Bentgrass – 9 lb N

N is expressed in lbs. of synthetic N – to convert to organic N required,  
multiply synthetic N by 0.5 or 0.6



## Fertilizer Summary

- Every 3 years do a complete Soil Test
- Adjust soil pH to 6.3 to 6.8
- Apply 100% organic/natural fertilizer
- **Aim for N:K = 1:1**
- **Avoid high N in spring**
- Leave grass clippings
- **At minimum, fertilize in September;** best is up to 4 times/year





# Grubs



In April and May, mature grubs of the Japanese beetle and other closely related grubs, either as one species or mixed populations, feed on grass roots, causing the turf to turn brown and die. In summer, the beetles enter the soils of turfgrass areas and lay eggs that hatch into small grubs. During September and October, with ample soil moisture, nearly full-grown grubs are within an inch of the soil surface or in the soil-thatch interface. They can be equally as destructive to turf as in the spring.





## Grubs

During spring or fall, when 20 or more third-stage grubs per square foot are present, severe root pruning at or slightly below the soil surface may cause the turf to die, especially if the temperature is relatively high or soil moisture becomes limited or both conditions occur. When roots are lacking, the soil can be lifted as though pulling up a rug.







# June Bug Larva (White Grub)





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# Leatherjackets



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# Crane Fly



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## Grub Control

Beneficial  
parasitic  
nematodes  
are an  
effective  
control

### Life Cycle of Beneficial Nematodes

Nematodes leave insect  
and search for new  
host insects

Nematodes release  
bacteria which kill  
insect

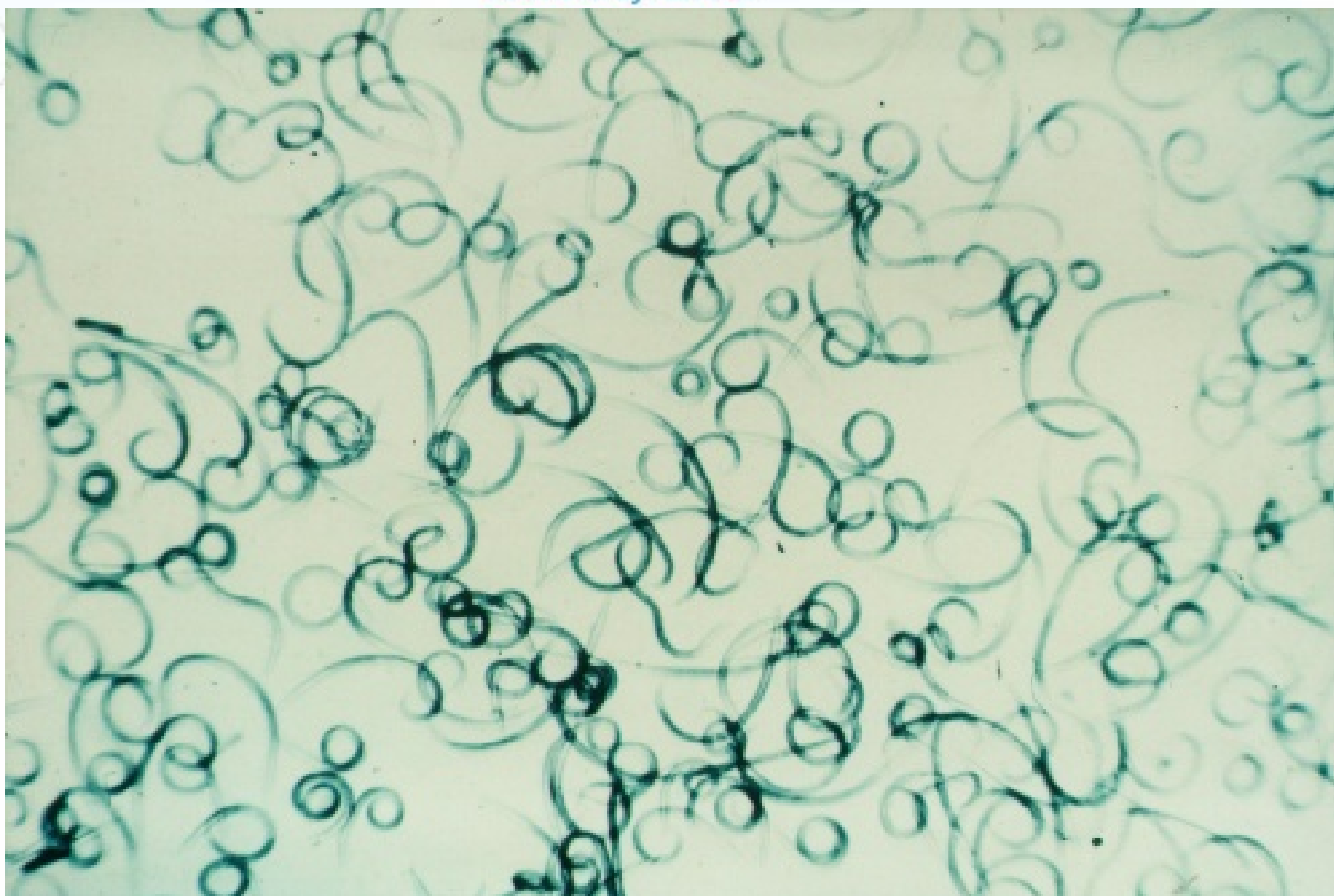
Nematodes enter host  
insect via body openings

Nematodes  
reproduce filling  
insect body





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# *Heterorhabditis bacteriophora*

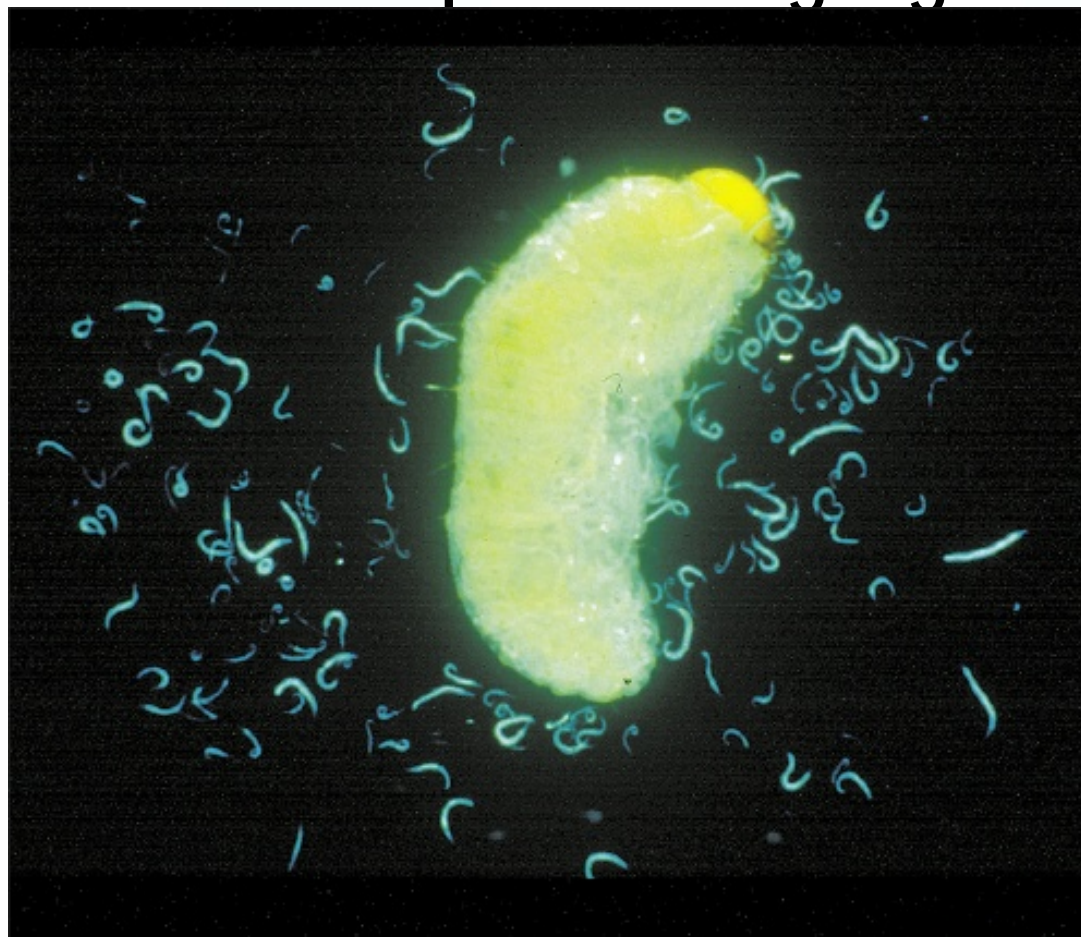
## Beneficial Nematode





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## Nematodes parasitizing a grub



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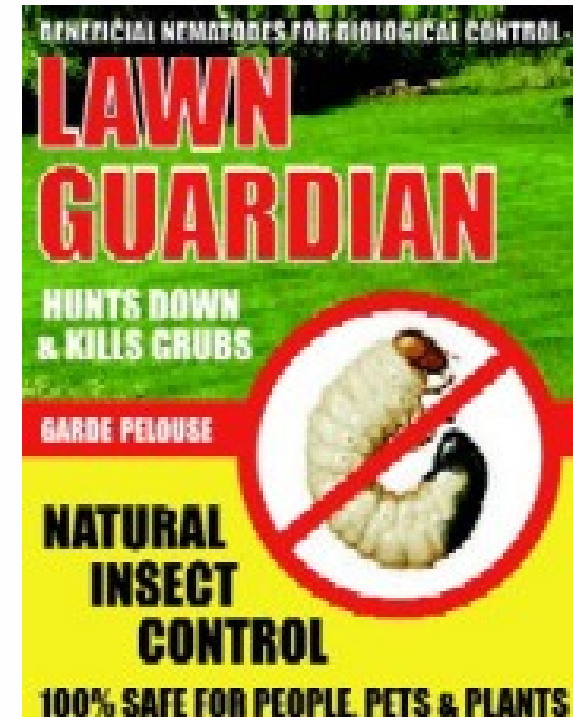
# Nematodes Feeding on a Parasitized White Grub





# Nematode Suppliers

- Environmental Factor –  
Oshawa Grub-Buster
- Koppert – Scarborough  
Terranem
- Plant Products – Brampton  
Nemasys







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# Chinch Bug

The chinch bug is a serious pest in many parts of Canada. Bentgrasses and fescues are particularly susceptible, but other species are also damaged. If there is a cold, wet spring, chinch bugs are usually not a problem because a fungus disease kills most of the overwintering adults. Turf injury occurs during hot, dry periods of summer as adults and nymphs inject a toxin into and suck the juice from stems and leaves.







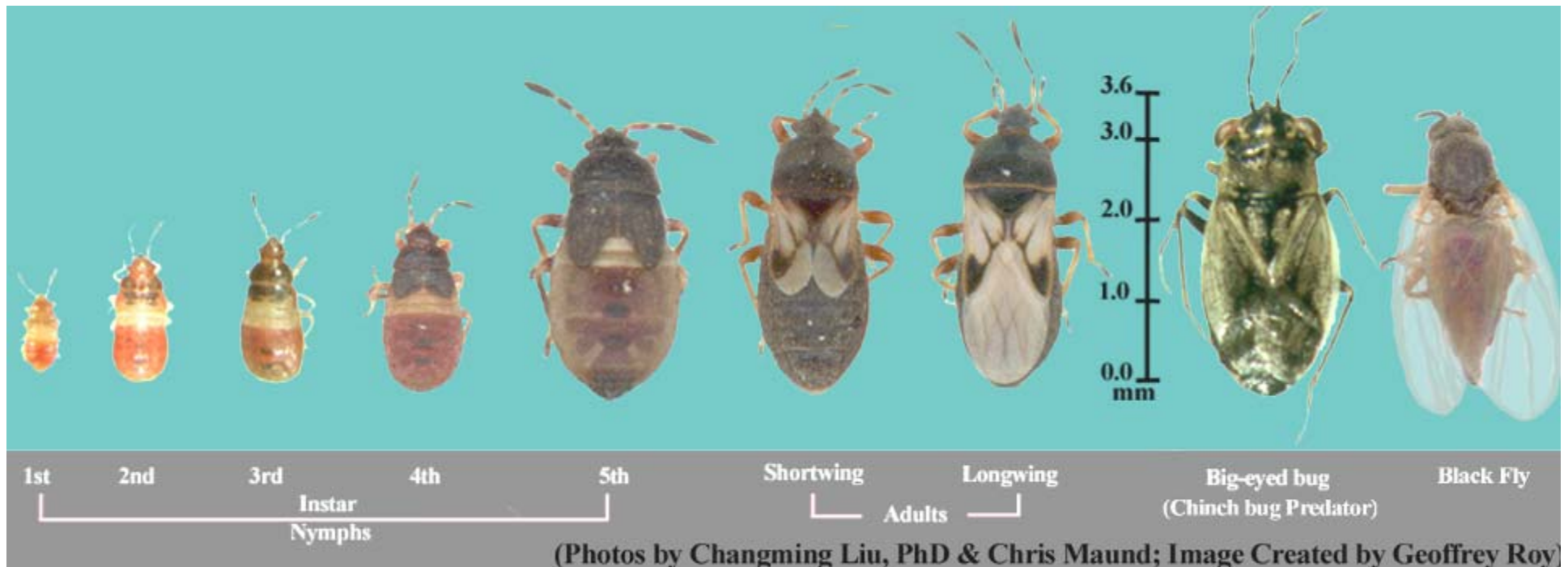
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## Chinch Bugs

Adults are blackish with white wings and are about one-fifth inch long. There are short-winged and long-winged adults. Nymphs, the immature forms, are red, brown, or black. All stages can be found at the base of the plants and on thatch, and they move rapidly. Damage occurs in a hot, dry summer. Their presence can be determined by drenching the turf and covering it with white cloth. If present, bugs will crawl onto the underside of the cloth in about 5 minutes.



# Chinch Bug Life Cycle



(Photos by Changming Liu, PhD & Chris Maund; Image Created by Geoffrey Roy)



Insects (including Chinch bugs)  
Indicate  
Soil Nutrient Imbalances  
which manifest as  
Plant Physiology Problems





## Preventing/Reducing Chinch Bug Damage

- Make grass drought resistant
- Do not use high N (use balanced slow-release fertilizer)
- Raise K and Ca
  - Raises leaf brix (sugar) – sucking insects avoid high sugar
- Reduce thatch – no place to hide
- Overseed with endophyte-infected perennial ryegrass and Creeping Red Fescue
  - Repels sucking insects
  - 30 to 40% stand is all that is needed





**TURF LOGIC CERTIFIED MIX**  
 35 % **Alene** Kentucky Bluegrass  
 30 % **Boreal** Creeping Red Fescue  
 35 % **Inspire** Perennial Ryegrass

For a beautiful, dark, thick,  
 durable, disease resistant turf in  
 sunny or shady conditions.

#### **Why Buy Certified Seed ??**

You will notice the certified  
 cultivar names **Alene**, **Boreal**  
 and **Inspire** listed above. These  
 cultivars or varieties have been  
 developed by Plant Breeders to  
 have specific genetic character-  
 istics which, when combined,  
 give improved performance.  
 The significant characteristics  
 that are important to you, the  
 Professional Turf Manager, are  
 increased purity, increased  
 germination, drought tolerance,  
 disease resistance, winter

hardiness, wear tolerance, and a  
 more attractive, darker green  
 colour.

Also, Certified Seed is the  
 only practical means of increas-  
 ing, ensuring and certifying that  
 a seed stock has high genetic  
 purity and quality standards.



#### **What is Endophyte ??**

Endophyte is a natural deterrent  
 to lawn feeding insects such as  
 chinch bugs, billbugs and sod  
 webworms. Endophyte is  
 technically a fungus  
 (*Acremonium lolii*) that grows  
 within the leaf and crown parts  
 of *Turf Logic's Inspire* Perennial  
 Ryegrass.

Two characteristics of the  
 endophyte have great practical  
 importance. First, the organism  
 does not affect either the growth  
 or appearance of the grass, and it  
 requires a laboratory analysis to  
 detect its presence. Secondly, it is  
 seed transmitted and apparently  
 not transmitted in any other way.  
 Thus, once a non-infected stand  
 is established, it can be expected  
 to remain that way.



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## Don't Skimp on Seed Quality

- Certified seed varieties
- 99.9% pure
- Weed free
- 3 species: Kentucky Bluegrass, Perennial Ryegrass, Creeping Red Fescue
- **Endophyte-infected PRG and Fescue**

## The Role of Potassium in Plants..

- Stomatal opening and closing  
i.e water balance
- Photosynthesis
- Structural component
- Starch formation
- Sugar transport
- Protein synthesis
- Disease resistance
- **Insect resistance**
- Nitrogen uptake





## Fertilizer Summary

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## NEW APPROACH

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Not Just Treat the Symptom





# Natural/Organic Works!



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## THE LOGICAL APPROACH™

### BEFORE TURF LOGIC



### AFTER TURF LOGIC



Enviro Masters franchise customer  
in Eastern Canada

The franchise turned to Turf Logic,  
and applied The Logical Approach™  
to this lawn

The results show for themselves  
after only one season



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Late May 2006

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September 2006

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Golf Course in Background

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Organic Turf Logic lawn





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Thank You  
Questions?

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