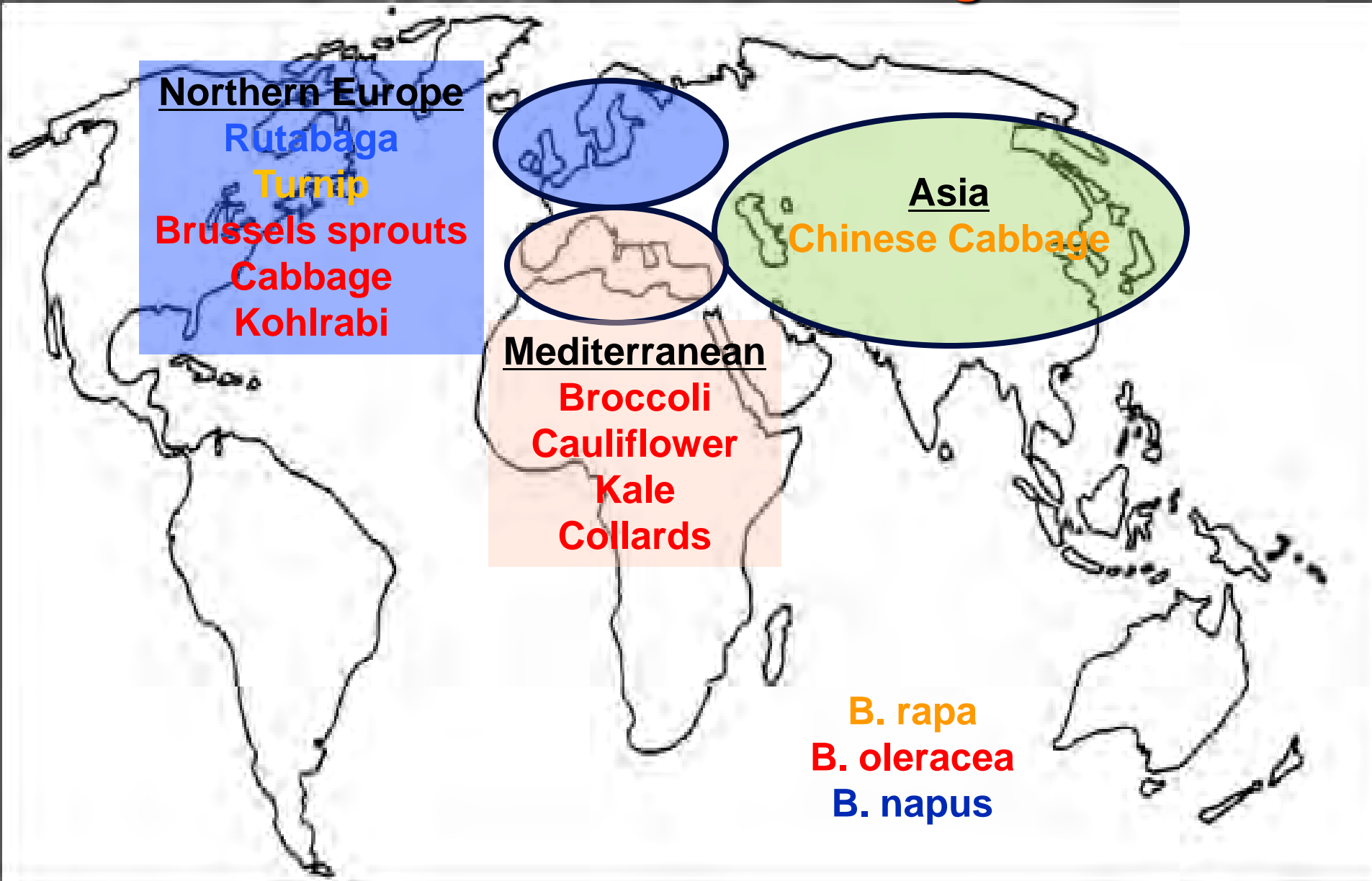


# Growing high quality Brussels sprouts



Ajay Nair and Andrew Dunham  
Iowa State University and Grinnell Heritage Farm  
PFI Annual Conference 1-20-2018

# Brassica Centers of Origin



Source: Reiners and Bellinder





Many uses of  
Brussels sprout

Could be used as an  
excellent Growth  
Chart Ruler/indicator

# Plan it before you plant it !

- Know your market
- Cultivar selection
- Primary market considerations
  - Quality
    - Uniform sizing
    - Postharvest quality
    - Flavor
  - Local
  - Reduced chemicals
  - Quality!!!!



# Site Selection

(warm is the key)

- Sandy to clay loam
- Must be well-drained
- pH = on the lower end (6.0 – 6.5)
- Ideal = sandy loam: dries out early and warms up faster in the spring.
- Slope = to the south. A 20 degree slope absorbs 6% more heat than level.



Map Unit Legend

?

Story County, Iowa (IA169)

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
55	Nicollet clay loam, 1 to 3 percent slopes	1.0	5.6%
107	Webster clay loam, 0 to 2 percent slopes	2.9	16.8%
138B	Clarion loam, 2 to 6 percent slopes	6.3	36.5%
138C2	Clarion loam, 6 to 10 percent slopes, moderately eroded	7.1	41.1%
Totals for Area of Interest		17.3	100.0%



# Cultivar selection

Cultivars	Days to maturity
<b>Churchill</b>	90
<b>Diablo</b>	110
<b>Dagan</b>	100
<b>Franklin</b>	80
<b>Early Marvel</b>	85
<b>Jade Cross</b>	85
<b>Nautic</b>	105







Transplant production: 5-6 weeks;  
Strive for improved quality and  
uniformity.



Planting: bare soil or plastic mulch

Crop	Between rows	In-rows
Kohlrabi	12-18"	4-8"
Broccoli	30-36"	8-12"
Cabbage, Cauliflower	30-36"	12-18"
Brussel Sprouts (single row)	30-36"	18-24"

Old Tree Farm, Carson, IA











Planting: Double row on plastic mulch  
HORT FARM





# Weed Management - cultivation

Healthy transplants can be “blind cultivated” with a flex-tine harrow to get early weeds



10 days after transplanting

# Weed Management - cultivation

Cultivation with sweeps between rows often done 2-5 times in brassica crops.



<http://www.sare.org/publications/steel/pg24.htm>

Sweep

S-tine shank

Moderate crown

10-40 days after transplanting



# Weed Management - cultivation





# Brassica: Soil fertility



Relatively heavy feeders

N often 100-150lbs/a, but too much can cause splitting (cabbage) or hollow stem (broccoli)

Brassica crops are sensitive to several micro-nutrient deficiencies

pH 6.5 – 7.0 best

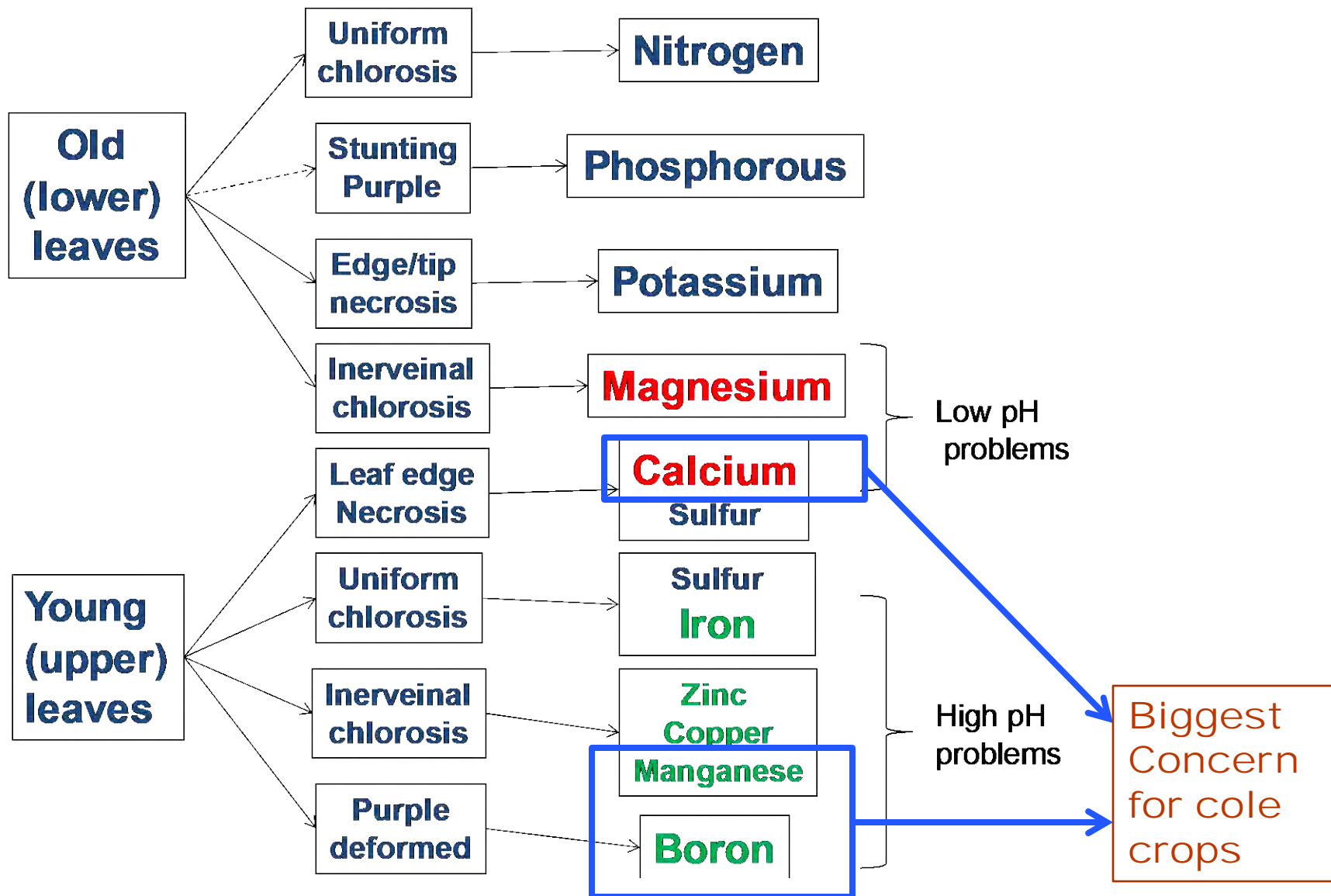




# Nutrient recommendation

<b>Nutrient concentration(s) from soil test</b>	<b>Status</b>	<b>Fertilizer needed (lb/A)</b>
<b>Phosphorus (ppm)</b>		<b>Phosphate (P<sub>2</sub>O<sub>5</sub>)</b>
Less than or equal to 15	Low	150
16 - 30	Medium	100
31 - 50	High	75
51 and higher	Very High	0
<b>Potassium (ppm)</b>		<b>Potash (K<sub>2</sub>O)</b>
Less than or equal to 80	Low	300
81 – 140	Medium	150
141 - 200	High	75
201 and higher	Very High	50
<b>Organic matter (%)</b>		<b>Nitrogen (N)</b>
Less than or equal to 3%	Low	150
3.1 – 19.0	Medium	120
19.1 and higher	High	40

# Nutrient Deficiency Review





# Micronutrients

Manganese Deficiency. High pH.

Young leaves: Interveinal chlorosis

Boron Deficiency. High pH

Mature leaves; chlorotic margins; water-soaked brown spots on curds

Molybdenum Deficiency. Low pH

Young leaves; puckered and twisted;  
Chlorosis of leaf margins and leaf cupping

Suggested soil micronutrient levels and sampling procedures for vegetable crops (download from ISU Extension and Outreach store online)



# Insect pests



Imported cabbage worm  
Cabbage loopers  
Japanese beetles too (secondary pest)



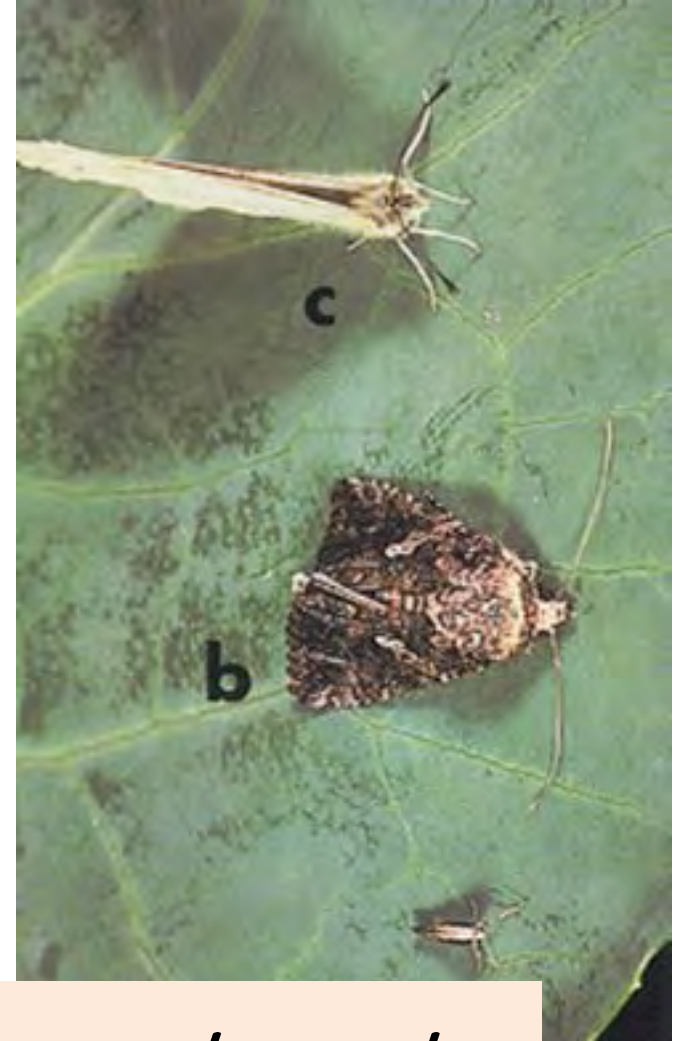
# Brassica pests – Lepidoptera moths and butterflies



**Imported  
cabbage  
worm**

**Cabbage  
looper**

**Diamondback  
moth**



Bt- *Bacillus thurengiensis*



# Effects of non-crop species on brassica insect pests

- Purslane diamondback moth;  
imported cabbageworm
- Redroot pigweed imported cabbageworm
- Red clover aphids; flea beetles;  
imported cabbageworm
- Mustard flea beetles; aphids
- Red Fescue flea beetles
- White clover flea beetles



# Which disease is it ?



Alternaria leaf spot



Cool and wet  
especially at night;  
heavy dew in the  
morning

- **Use pathogen free seed**
- **Practice 3-4 year crop rotation**
- **Incorporate crop residue at the end of the season**
- **Manage cruciferous weeds**
- **Fungicides: Chlorothalonil, Azoxystrobin, Mefenoxam**



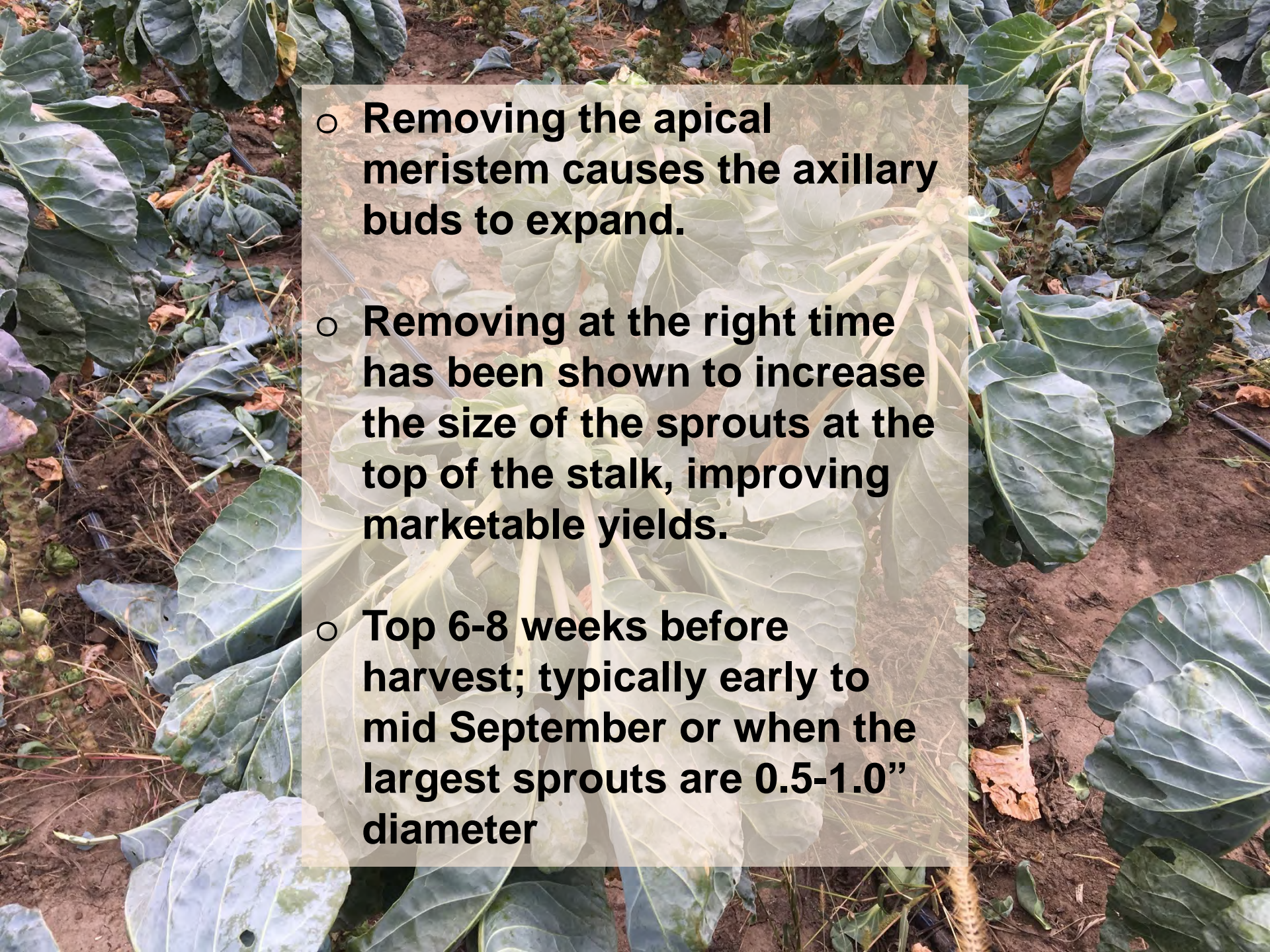


# To Top or not-top - Implications



Grade A Gardens, Des Moines, IA



- 
- **Removing the apical meristem causes the axillary buds to expand.**
  - **Removing at the right time has been shown to increase the size of the sprouts at the top of the stalk, improving marketable yields.**
  - **Top 6-8 weeks before harvest; typically early to mid September or when the largest sprouts are 0.5-1.0" diameter**



Whole stock  
harvest better for  
smaller markets





Cut at the base  
with a knife or  
lopper (clean cut)







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# Many Thanks

Brandon Carpenter  
Nick Howell



Andy Dunham  
Jordan Clasen  
Mike Von Weihe



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