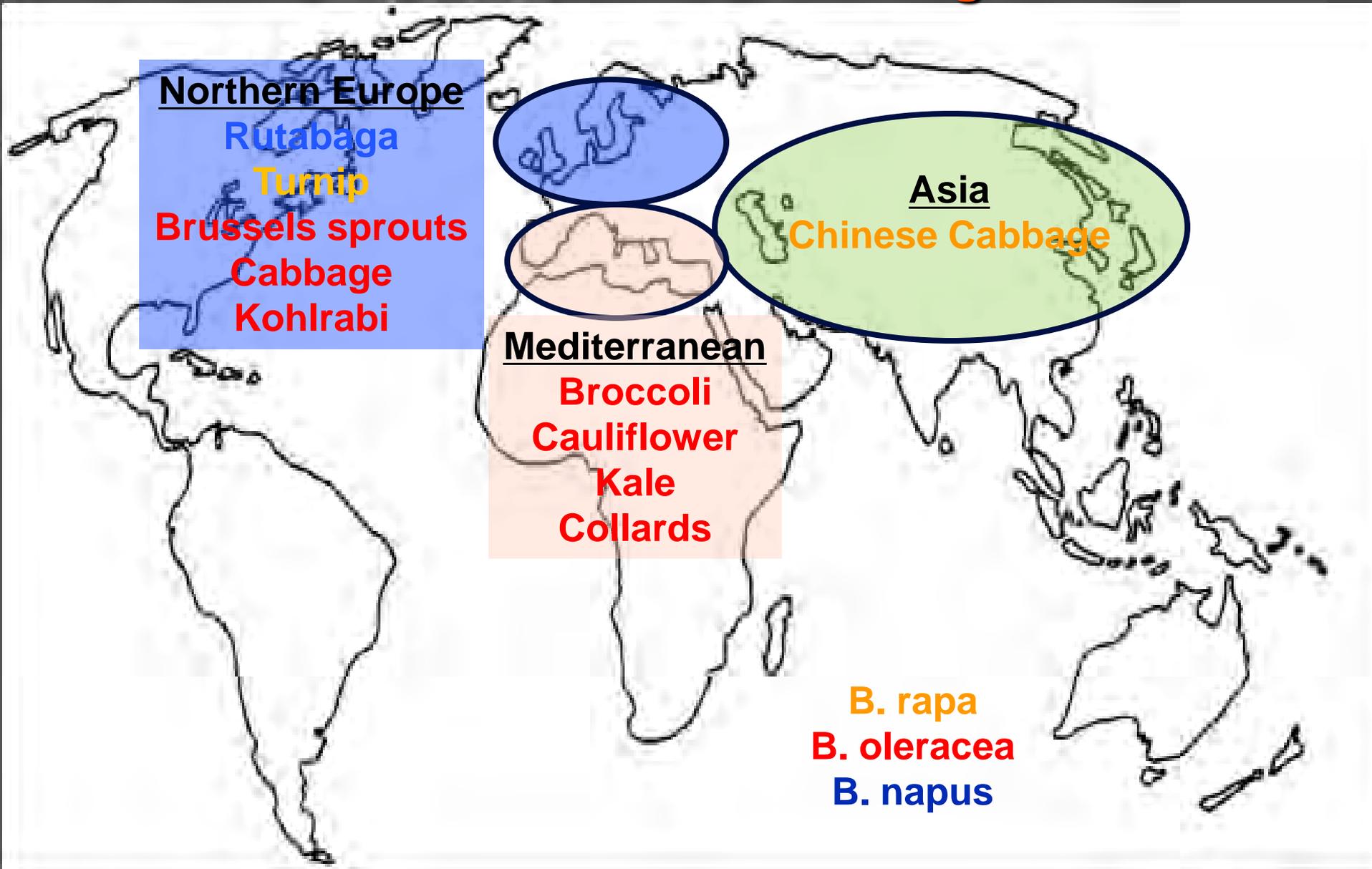


Growing high quality Brussels sprouts



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
Churchill	90
Diablo	110
Dagan	100
Franklin	80
Early Marvel	85
Jade Cross	85
Nautic	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



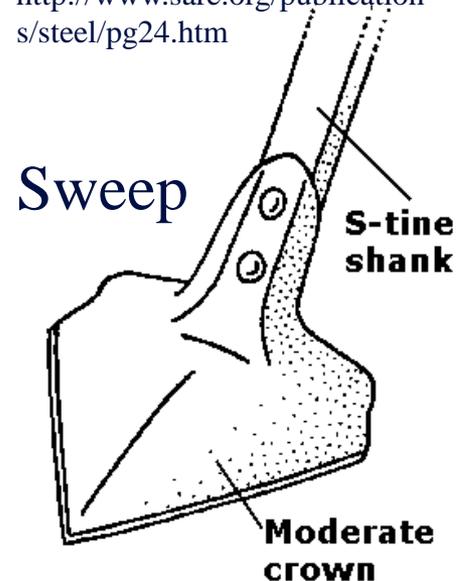
10 days after transplanting

Weed Management - cultivation

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



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



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

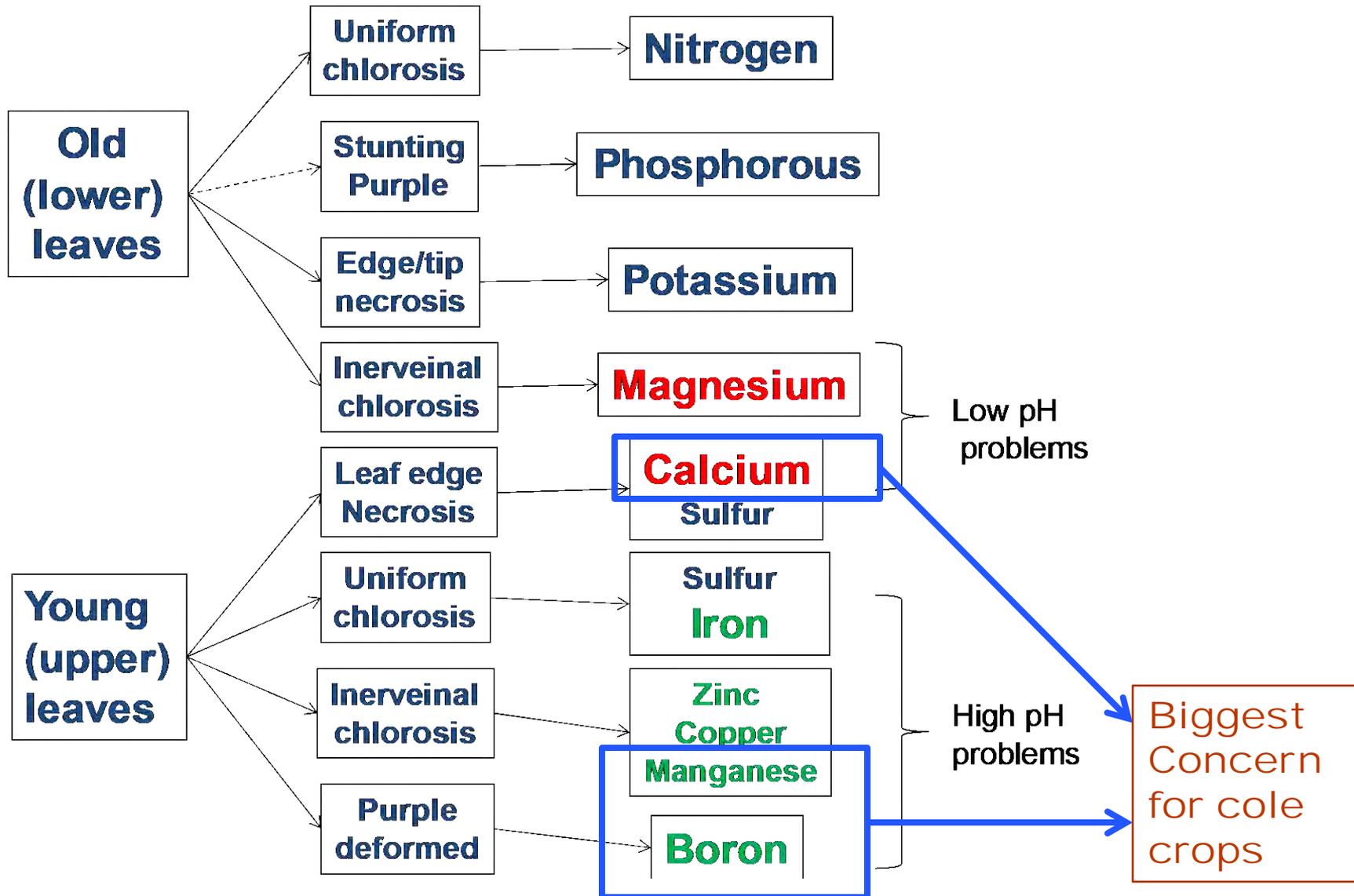
pH 6.5 – 7.0 best



Nutrient recommendation

Nutrient concentration(s) from soil test	Status	Fertilizer needed (lb/A)
Phosphorus (ppm)		Phosphate (P₂O₅)
Less than or equal to 15	Low	150
16 - 30	Medium	100
31 - 50	High	75
51 and higher	Very High	0
Potassium (ppm)		Potash (K₂O)
Less than or equal to 80	Low	300
81 – 140	Medium	150
141 - 200	High	75
201 and higher	Very High	50
Organic matter (%)		Nitrogen (N)
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)

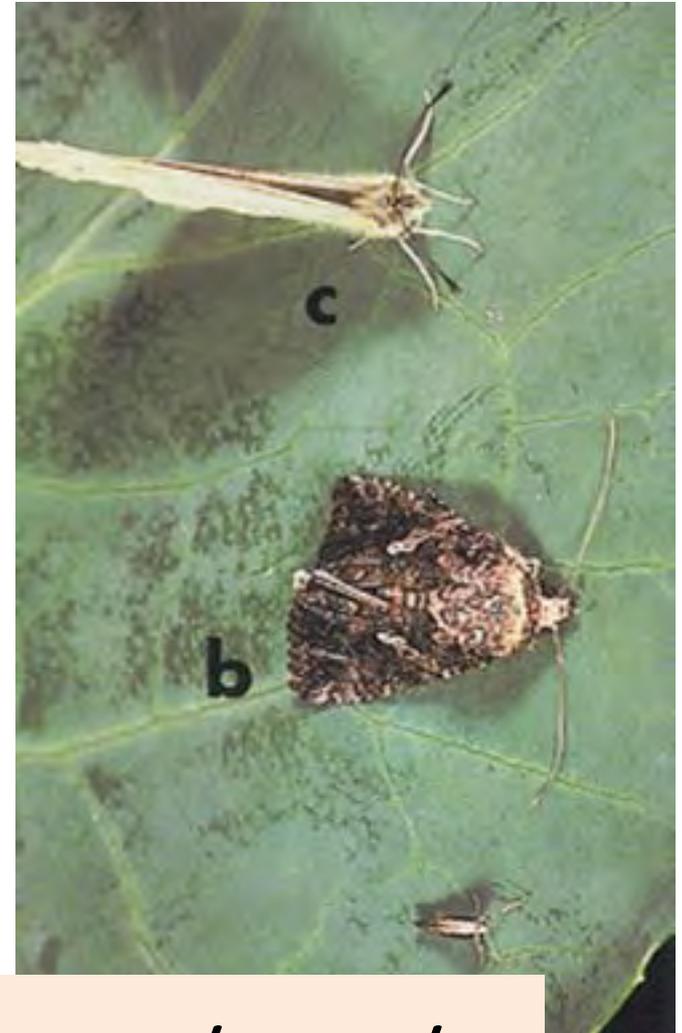
Brassica pests – Lepidoptera moths and butterflies



Imported
cabbage
worm

Cabbage
looper

Diamondback
moth



Bt- *Bacillus thuringiensis*

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



- **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**

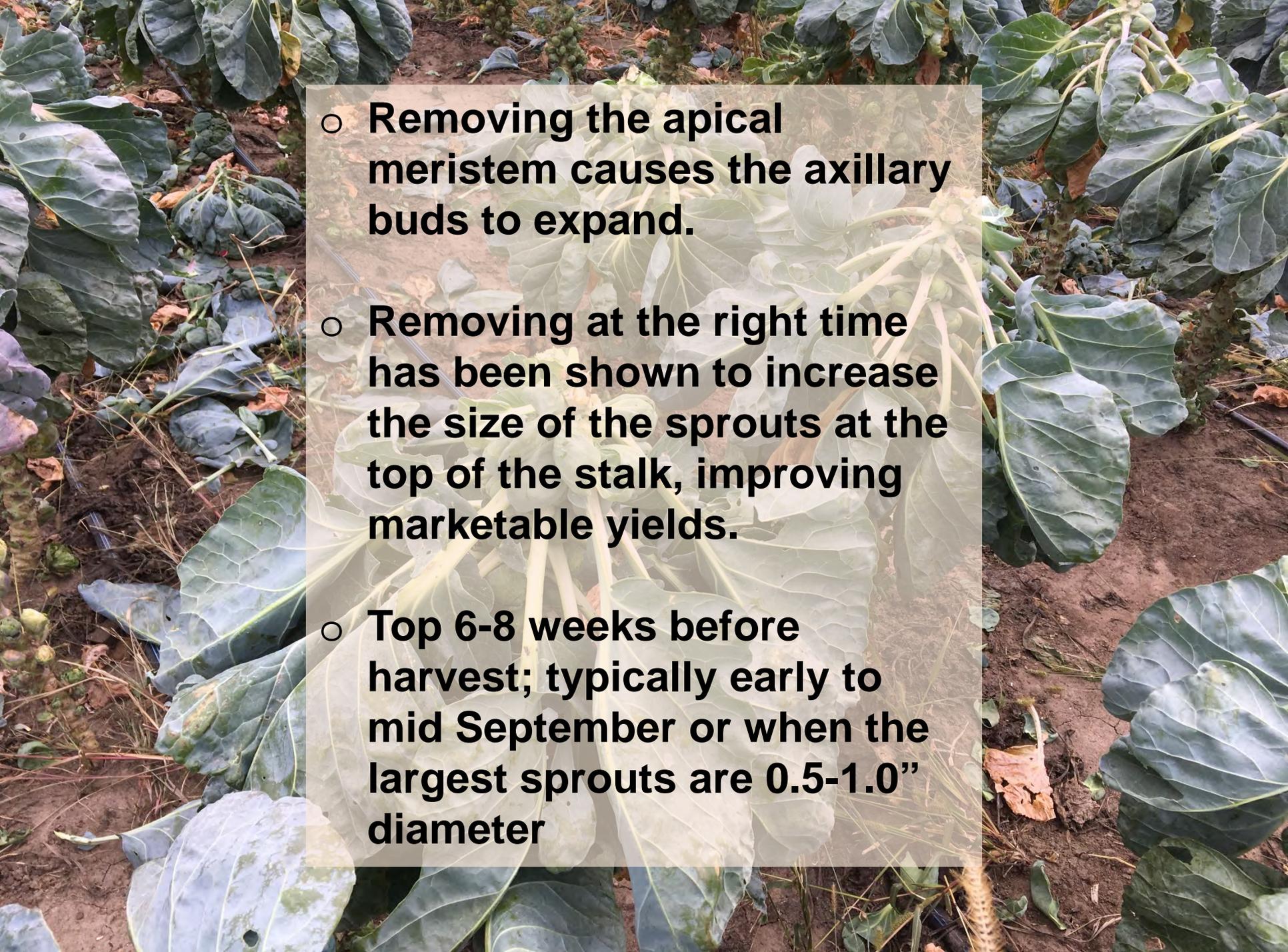
Cool and wet especially at night; heavy dew in the morning



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)





Many Thanks

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Nick Howell



Andy Dunham
Jordan Clasen
Mike Von Weihe



LEOPOLD CENTER
FOR SUSTAINABLE AGRICULTURE

Contact

Dr. Ajay Nair

Email: nairajay@iastate.edu

Phone: 515-294-7080



extension.iastate.edu/vegetablelab
iowavegetables.blogspot.com