

Cornell Cooperative Extension Vegetable Program

Bringing It Home: Harvest Tips For High Quality Onions

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Cornell Cooperative Extension Vegetable Program

*Empire State Producers Expo Small-Scale Onions,
Syracuse, NY; January 19, 2017*



When to Harvest Onions?

When the process of bulbing is complete:

- Plant does not put on new leaves
- Neck gets soft & plant lodges (falls over)
- Roots begin to die.



Onion plant no longer putting on new leaves



Lodged onion crop, bulbs still increase in size

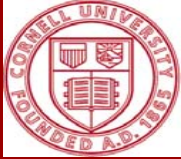


When to Harvest Onions

50-80% lodging (when onions fall over)

- During lodging, nutrients are translocated from the leaves into the bulbs
- Continue to put on size (25-33%)...
- ...until roots are loose
- Tug on the plants to see if they are still hanging on
- If they pull out of the ground without resistance, they are ready to harvest
- Earlier or later than 50-80% lodging: sprouting % reduced skin quality





Healthy Foliage = Quality Bulbs

- In general, bulb quality is best during hot and dry growing seasons (although size is down)
- Cool and wet growing seasons are most favorable for disease development and can result in poor bulb quality
- Ideally, onions dry down naturally, not from stress



Botrytis neck rot (fungal)



Bacterial bulb rot





Healthy Foliage = Quality Bulbs

Reduce plant stress

- Healthy foliage = healthy bulbs
- Ensure proper fertility
- Moisture availability
- Control pests
 - Bacterial diseases
 - = rotten bulbs
 - Downy mildew- Stemphylium leaf blight complex (DM-SLB)
 - = premature plant mortality (onions dying standing up)
- To encourage ripening and to avoid skin splitting by bulb swelling after skins have set, **stop irrigation about 3 weeks before lifting.**





Bacterial Diseases of Onions





Bacterial Diseases of Onions





Bacterial Diseases of Onions

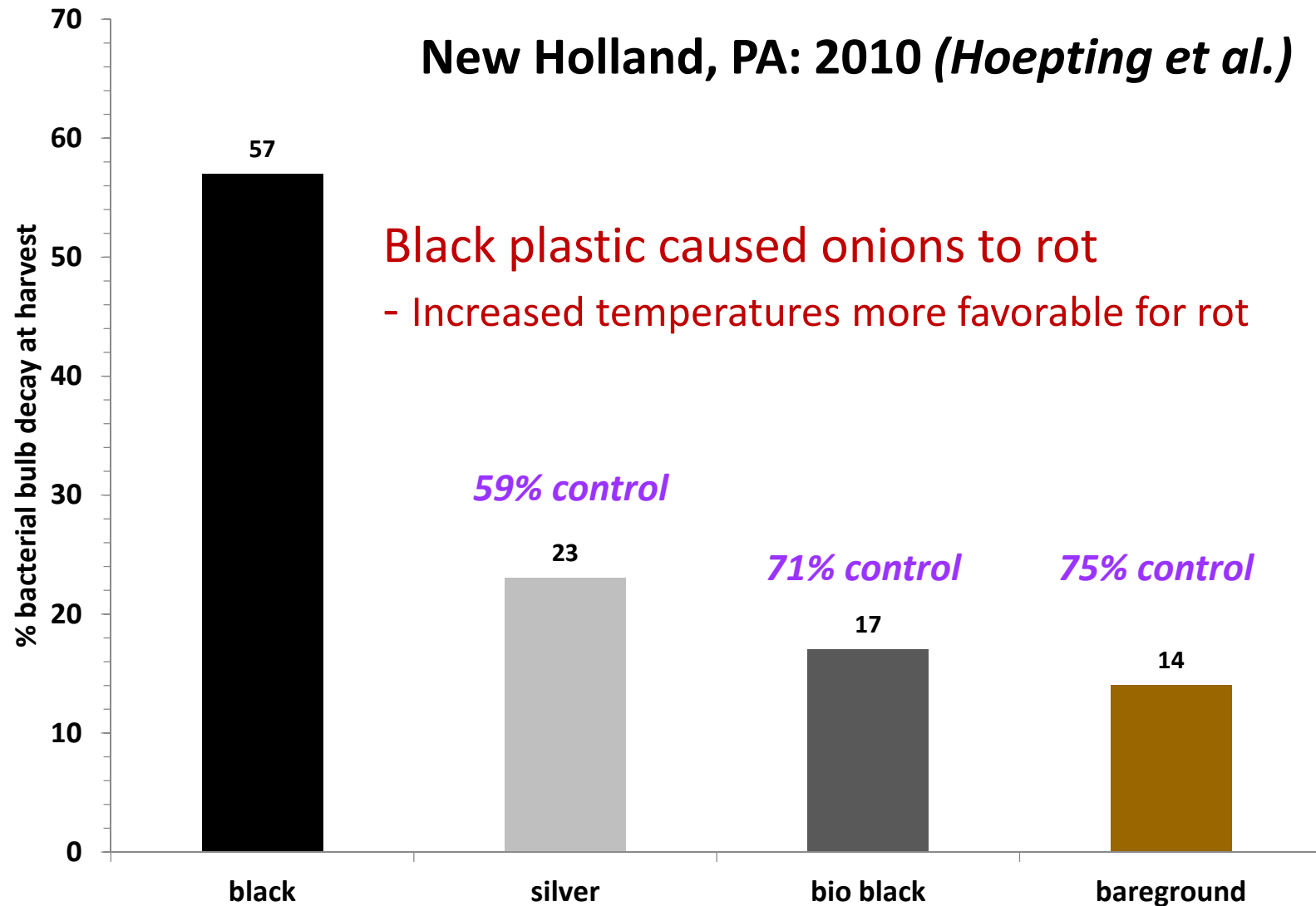




Results: 2010 Mulch Trial

% Bacterial Bulb Decay

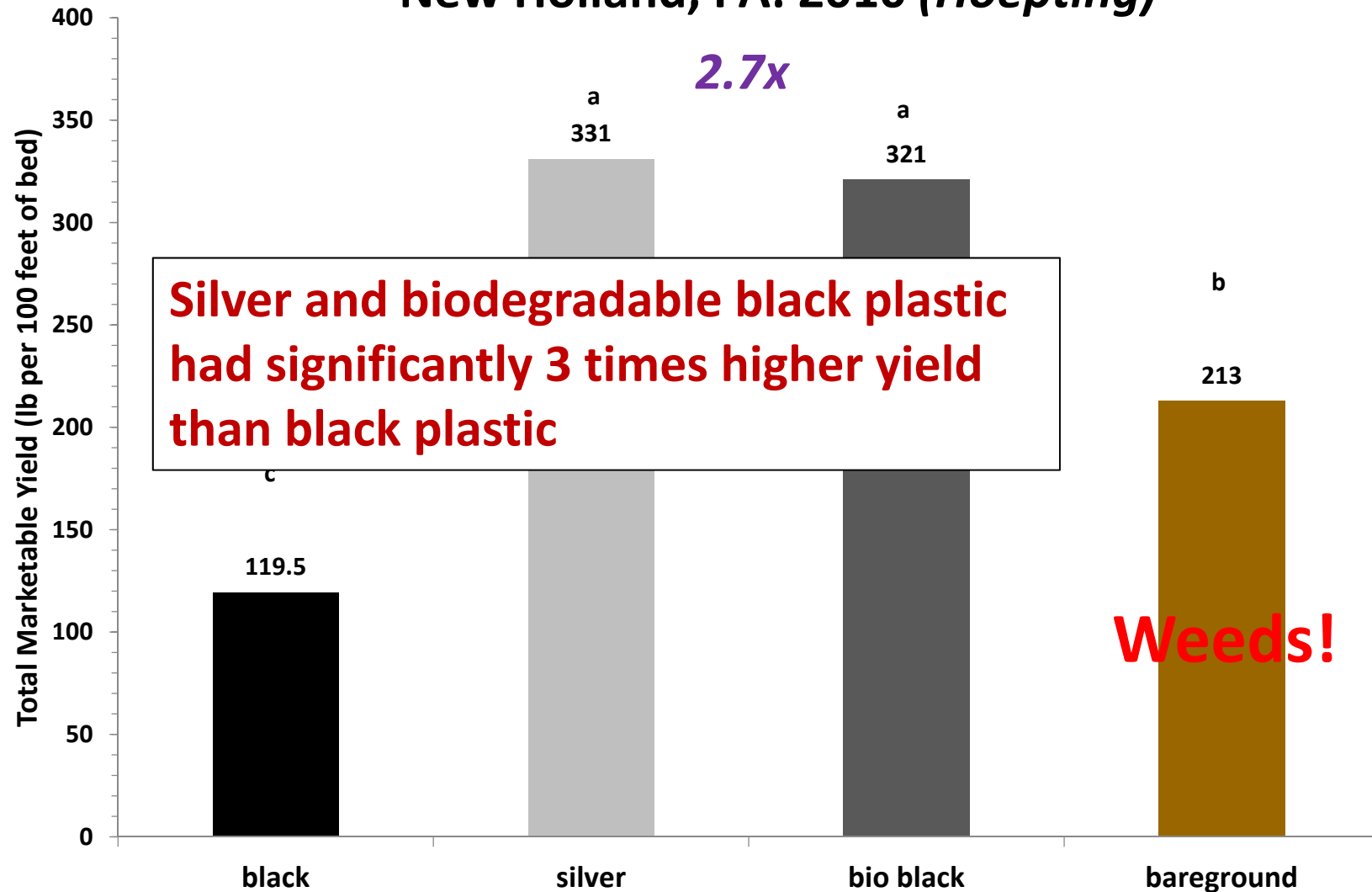
New Holland, PA: 2010 (*Hoepting et al.*)





Results: 2010 Mulch Trial Marketable Yield

New Holland, PA: 2010 (*Hoepting*)





2010 Mulch Trial at Harvest

July 20, 2010

Black plastic



Silver plastic



New Holland, PA: 2010 (Hoepting et al.)



2010 Mulch Trial at Harvest

July 20, 2010

Biodegradable
black



Bare ground

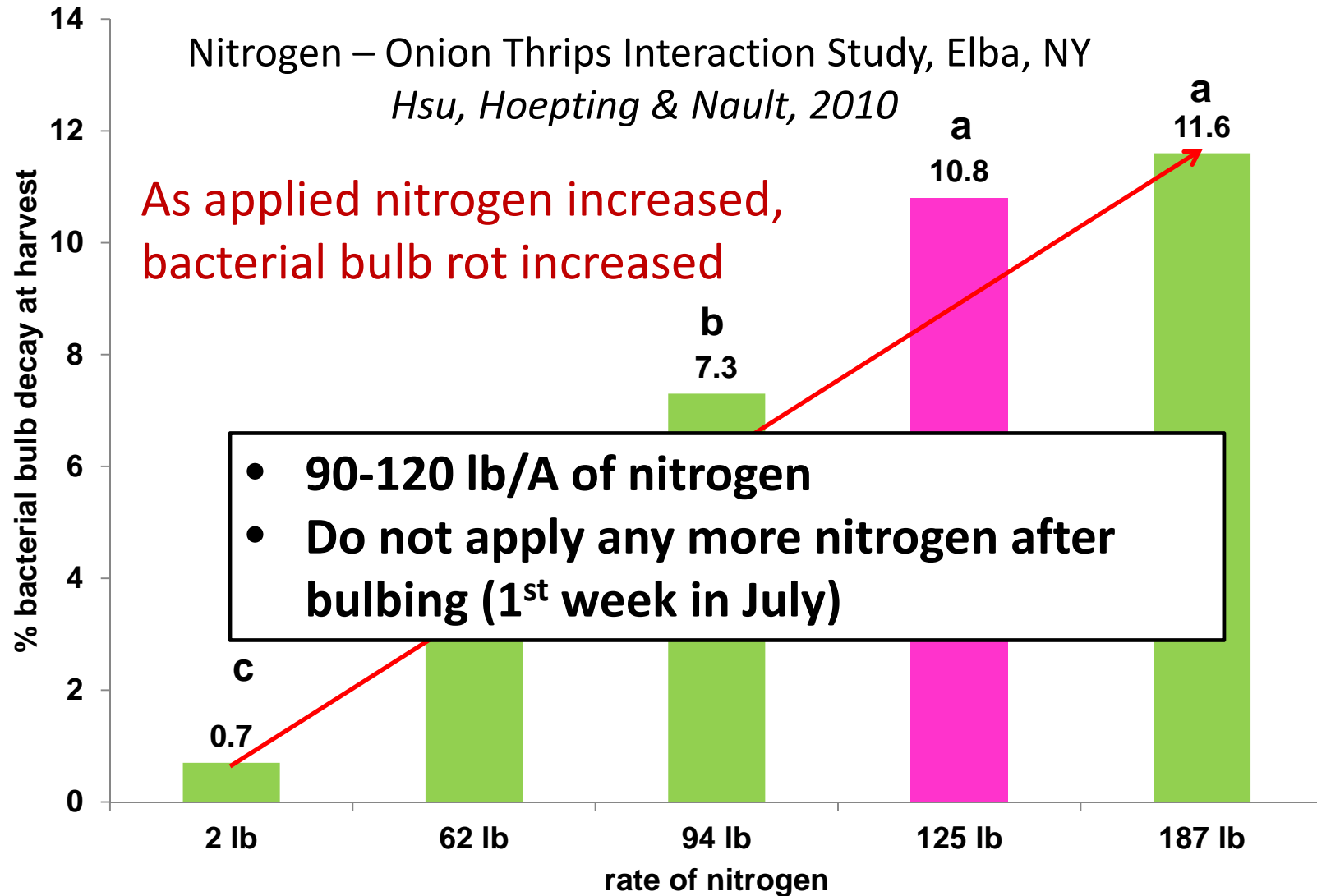


Weeds!

New Holland, PA: 2010 (Hoeping et al.)



Be Aware That High Nitrogen Can Increase Bacterial Bulb Rot





Harvest Onions Early to Avoid Bacterial Disease

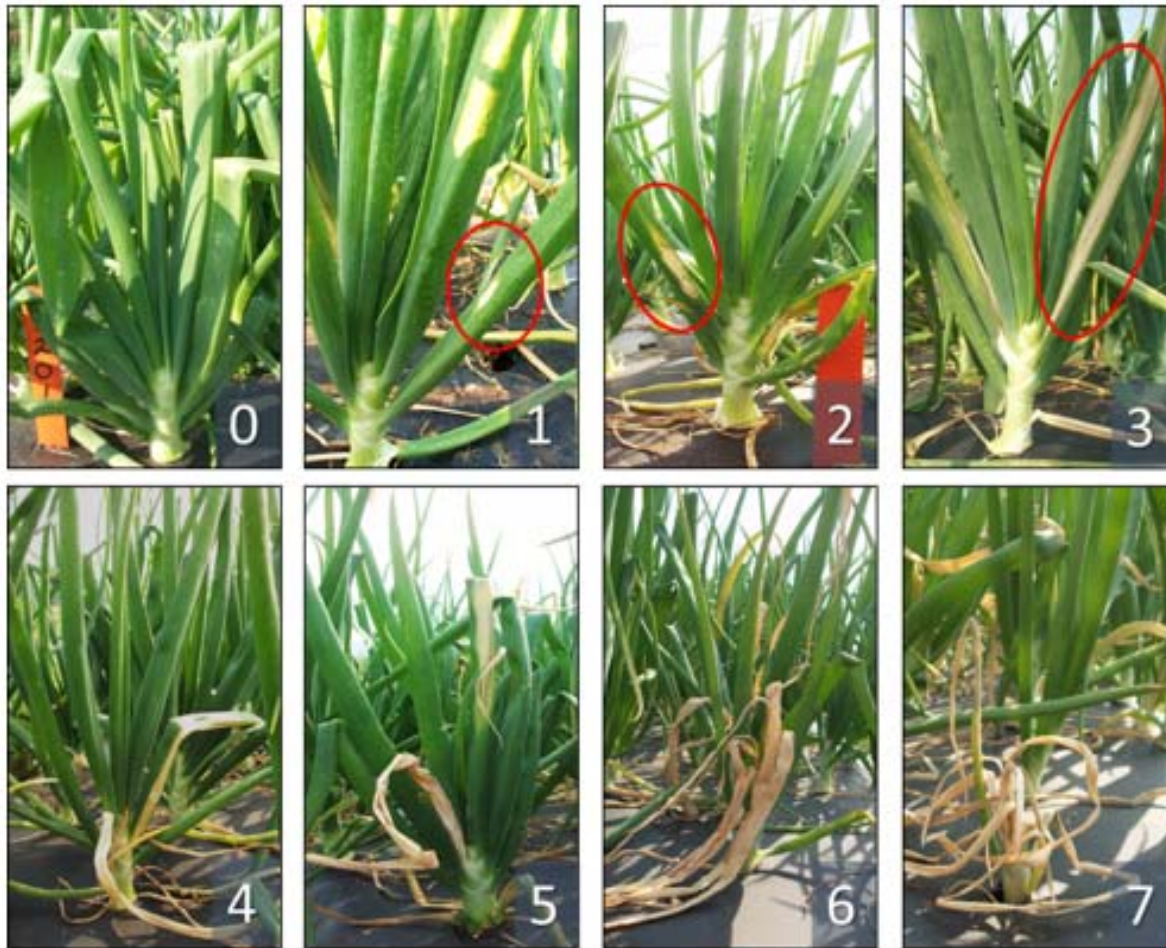
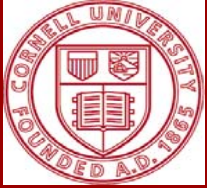


Figure 2. Visual rating scale: 0 = no lesion, asymptomatic; 1 = Local lesion (< 2.5 cm x 2.5 cm); 2 = Expanded lesion but less than ¼ leaf; 3 = ½ of leaf chlorotic or bleached; 4 = Entire leaf is bleached and wilting; 5 = One entire leaf and a portion of another leaf are bleached and wilted; 6 = Multiple fully symptomatic leaves; and 7 = ≥50% of leaves bleached and collapsed.

Penn State recommends harvesting when above-ground bacterial disease severity is mid-range (scale 3-4 out of 7.0)

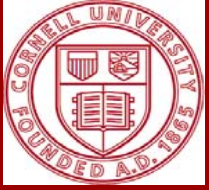


Premature Plant Mortality

Premature mortality; onions “dying standing up”



Photo: C. Hoeping

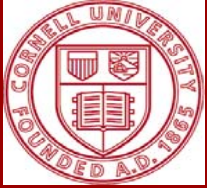


Effect of Premature Mortality (Dying Standing Up) on Bulb Rot

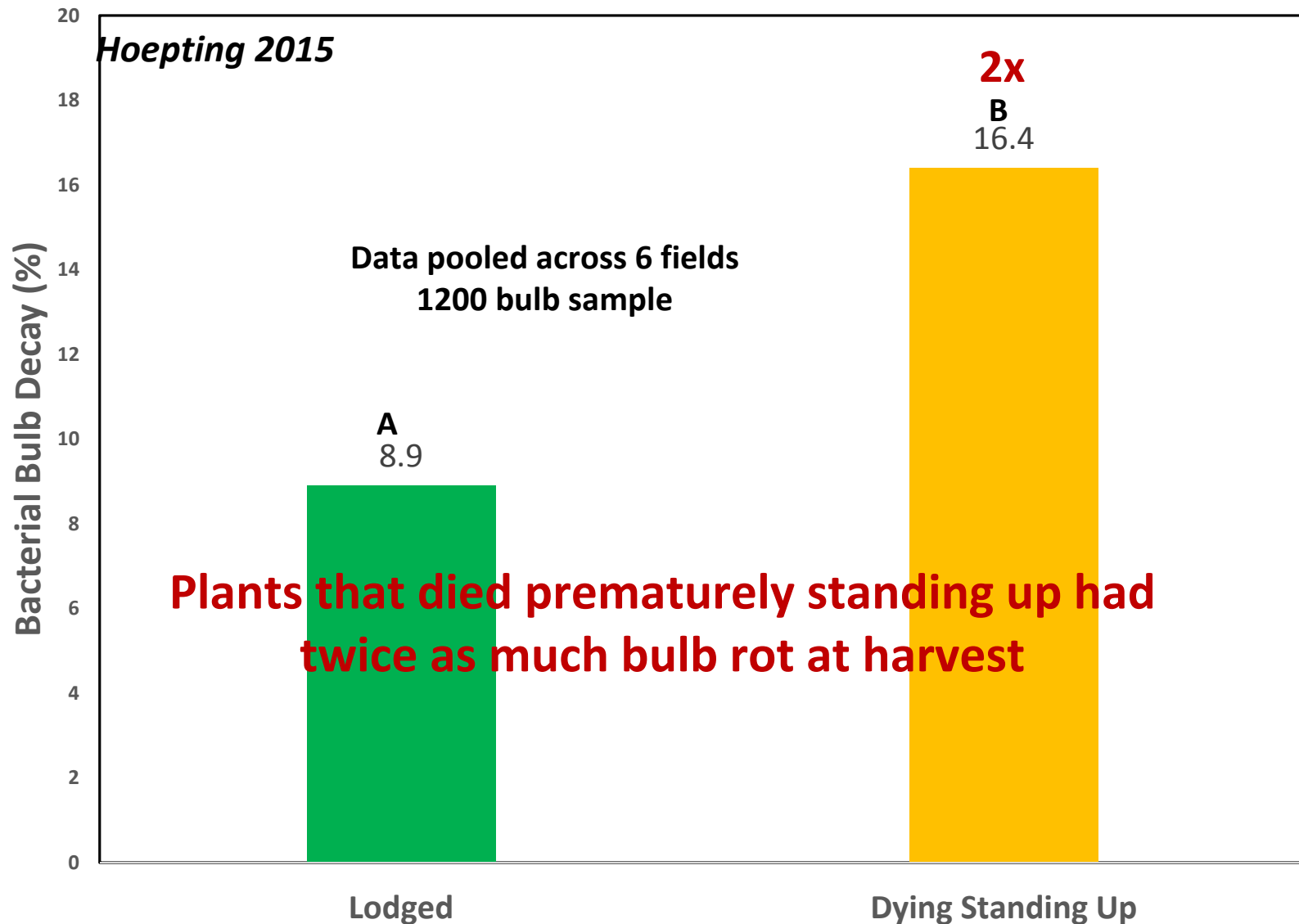
2015 experiment

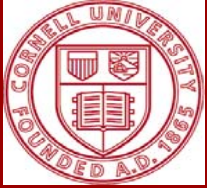


Photo: C. Hoeping



Effect of Dying Standing Up on Bulb Rot

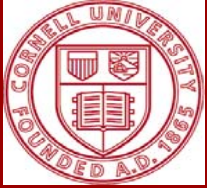




Downy Mildew-SLB Complex

- SLB is a secondary invader of downy mildew which ultimately becomes a very aggressive leaf defoliator





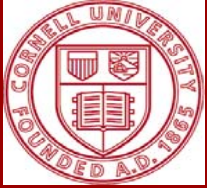
Diagnosis: Stages of Downy Mildew



1 week old



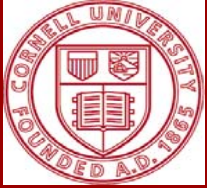
2 weeks old



Diagnosis: Stages of Downy Mildew



3 weeks old



Diagnosis: Stages of Downy Mildew



4 weeks old



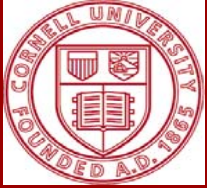
Diagnosis: Can You Spot the DM Hot Spot?





Diagnosis: Can You Spot the DM Hot Spot?

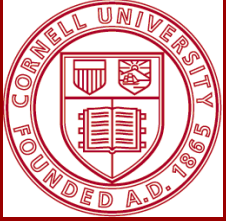




Diagnosis: Can You Spot the DM Hot Spot?



This much black on leaf tips is usually associated with DM-SLB complex

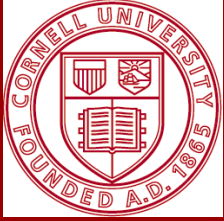


Suggested Program For Best DM-SLB Control

- When conditions are right for DM, it can barely be controlled with fungicides
- Fungicides must be applied preventatively
- Scout for early signs of disease (purple fuzzy sporulation in middle-aged leaves)

Preventative Program:

- Mancozeb for DM
- Or, FRAC 11 fungicides
 - Quadris Top (3, 11), also control SLB
 - Merivon (7, 11), also control SLB
 - Tanos (11, 27)
- SLB Fungicide
 - Luna Tranquility & Merivon are best
 - Inspire Super, Quadris Top
 - FRAC group 3 or 7 every week



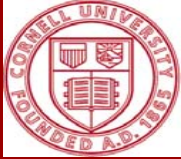
Suggested Program For Best DM-SLB Control

Once DM is detected: Cadillac Program

Product (rate per acre)	FRAC groups	Disease(s) Controlled
<i>Week 1, 2 & 4</i>		
Ridomil Gold Bravo 2.5 pt*	4, M5	DM
+ mancozeb 3 lb	M3	DM
+ Luna Tranquility 16 fl oz	7, 9	SLB
<i>Week 3, 5:</i>		
Orondis Opti**	US15	DM
+ Quadris Top	3, 11	SLB, DM

*Must rotate away from Ridomil Gold Bravo after two consecutive sprays. Maximum 3 apps.

**Hopefully, will be labeled in 2017 in New York



Harvest Tips for Best Quality

- Best management practices are most critical for **onions that are intended to be stored**, and not those sold directly out of the field



Sold directly out of field



Sold out of storage

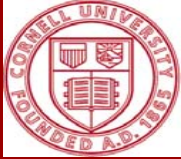


Harvest Tips for Best Quality Onions

Pulling and Windrowing:

- Pull when 50% - 80% lodged when bulbing is complete
- Do not pull/windrow onions when temperatures are in high 80s and 90s or leave in intense direct sunlight = sunscald (especially if still a bit green)
- Secondary pathogens invade tissue damage invaded by sunscald = bulb rot





Harvest Tips for Best Quality Onions

Pulling and Windrowing: Avoid Sunscald

- Orient pulled onions so that the leaves lay over top of the bulbs



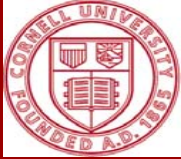


Harvest Tips for Best Quality

Pulling and Windrowing: Avoid Sunscald

- Move the pulled onions with the tops on into a greenhouse or high tunnel to dry.
- Temperatures should be held below 85 °F
 - Black shade curtain/cloth over the house
 - Ensure good air movement.





Harvest Tips for Best Quality

Pulling and Windrowing: Onions Dying Standing Up

- If onions are dying standing up, they should be pulled
- may take a bit longer for the necks to dry





Harvest Tips for Best Quality

Topping and Harvesting:

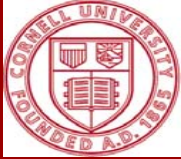
- Storage-bound onions should only be topped when the neck is dry and has no green tissue
- Rustle sound
- Leave 2-3 inches of neck when topping

Top dry!



Do not top **green!**





Harvest Tips for Best Quality

Topping and Harvesting:

- **Bacterial diseases, Botrytis neck rot** (caused by the fungal pathogen, *Botrytis allii*) and **black mold** can enter into and move through green tissue into the bulbs.
- These diseases do not infect or move in dry tissue.



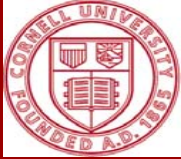


Harvest Tips for Best Quality

Topping and Harvesting:

- Do not harvest onions when conditions reach 90 °F and 90% relative humidity, because black mold could develop





Harvest Tips for Best Quality

Topping and Harvesting:

- Conduct harvest practices when weather is dry
- Avoid bruising during harvest procedures



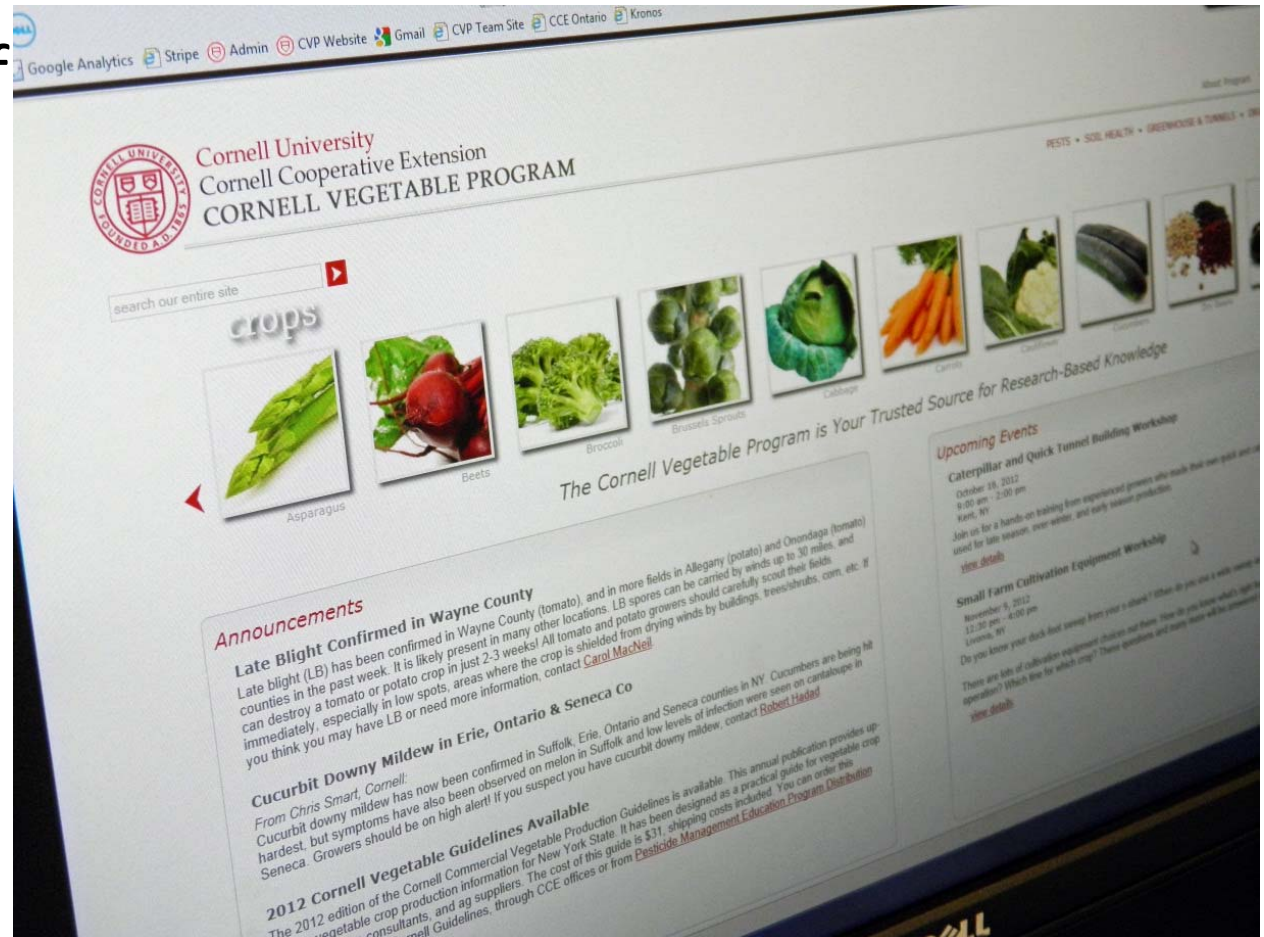
Brown stain,
caused by a soil-
borne fungal
pathogen that
causes the onion
skin to stain



More Information

- Sept/Oct issue of Onion World
- PDMR reports

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Next Steps: Curing & Storage



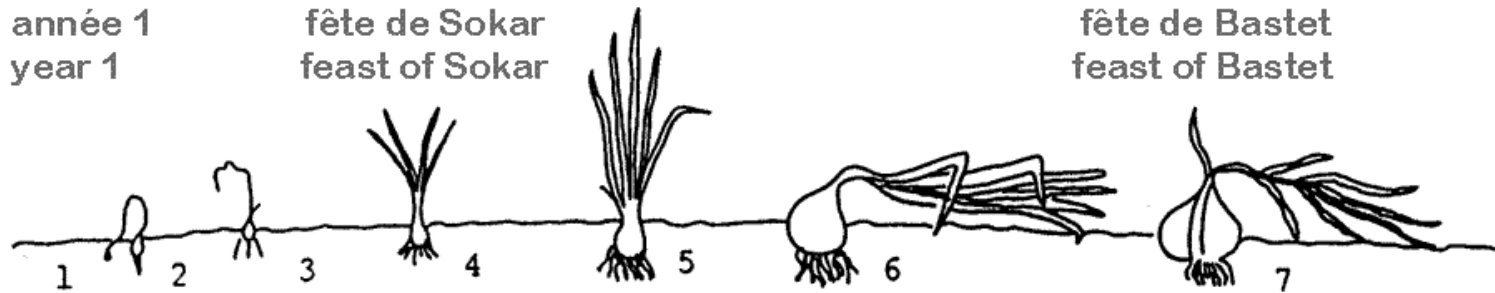


When to Harvest Onions

année 1
year 1

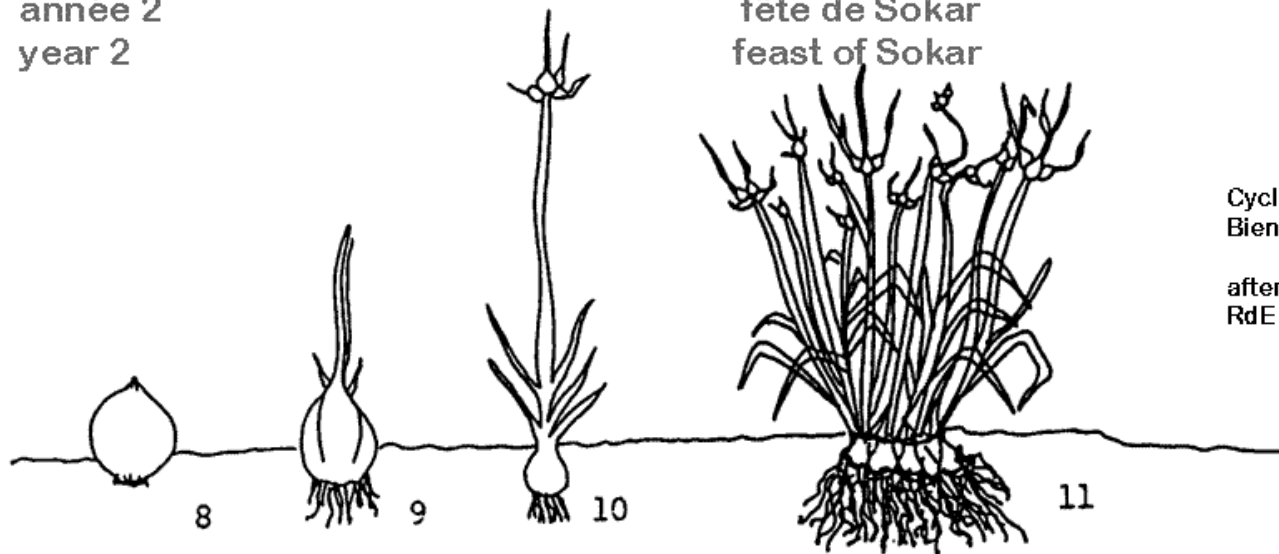
fête de Sokar
feast of Sokar

fête de Bastet
feast of Bastet



année 2
year 2

fête de Sokar
feast of Sokar



Cycle bisannuel de l'oignon
Biennial cycle of the onion

after Graindorge-Hereil C.
RdE 43, p.91