UCAN: ENHANCED EFFICIENCY FERTILIZER FOR IMPROVED POTATO PRODUCTION AND TUBER QUALITY

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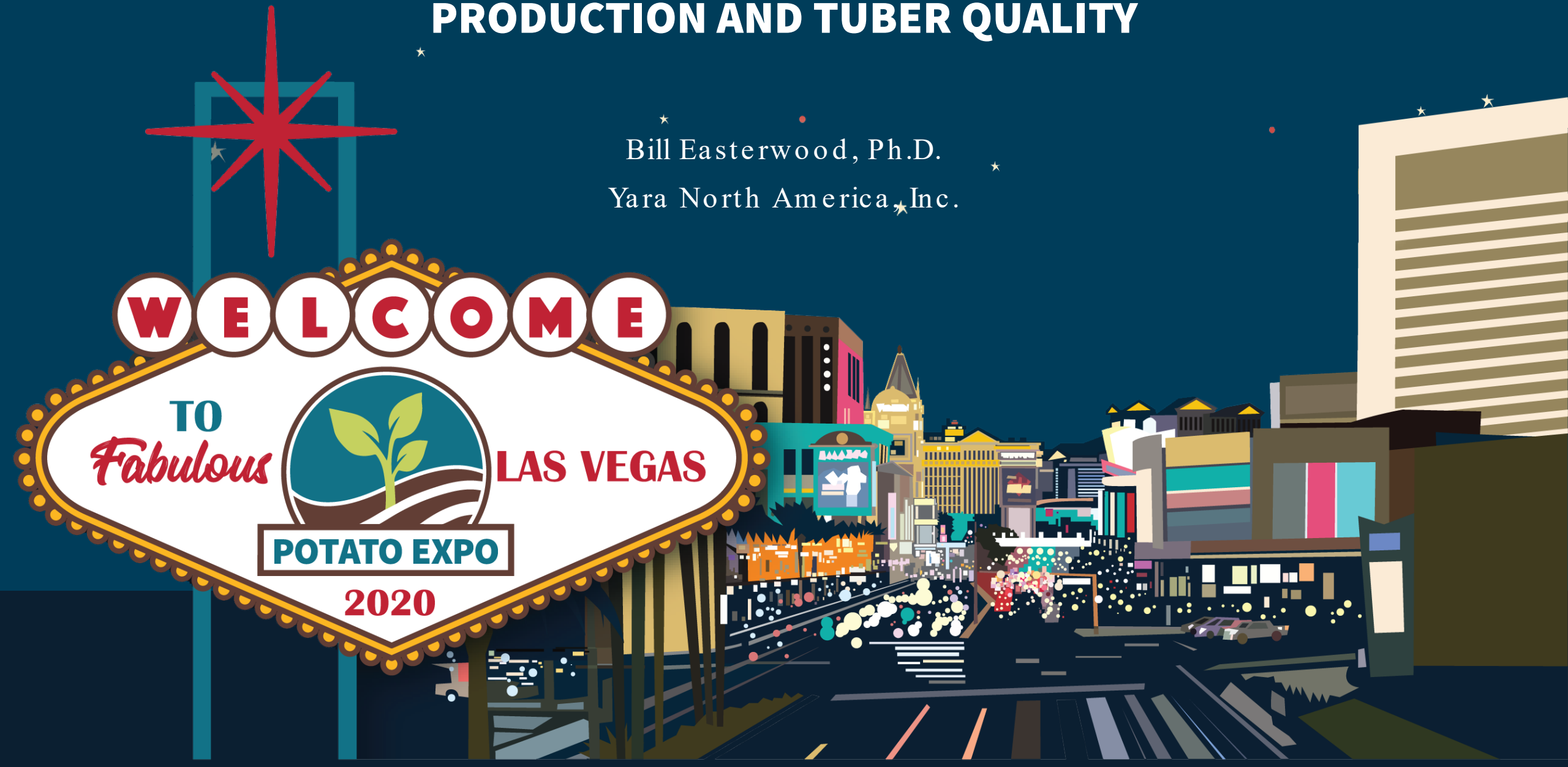
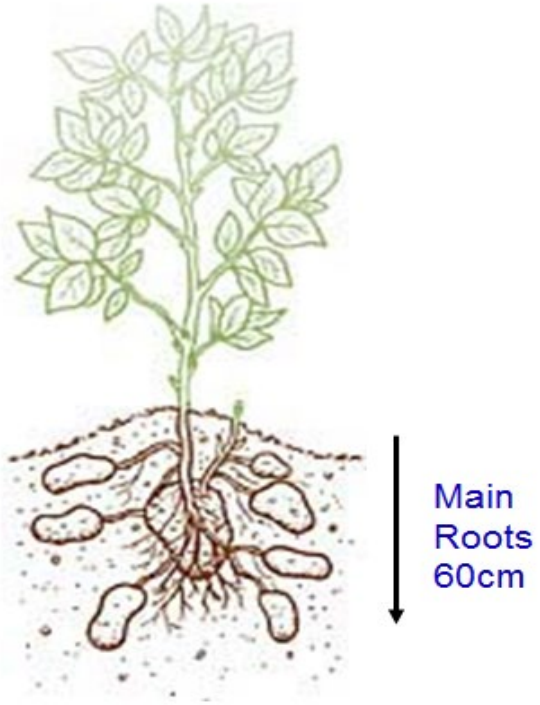
Yara North America, Inc.

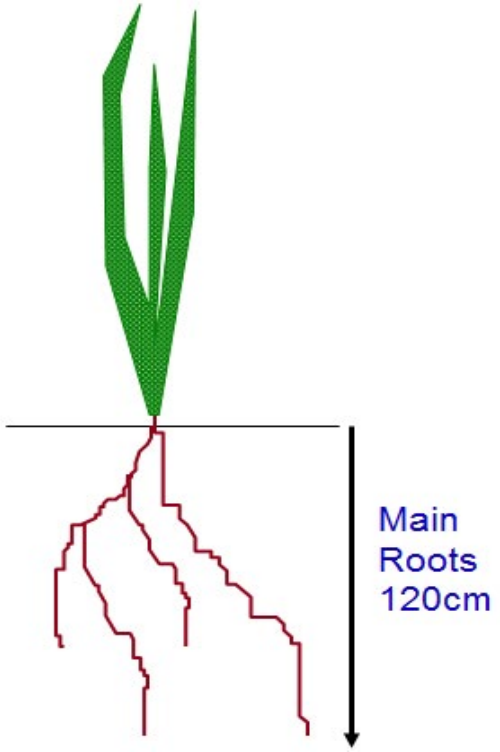


WHAT IS UNDER THE HOOD?

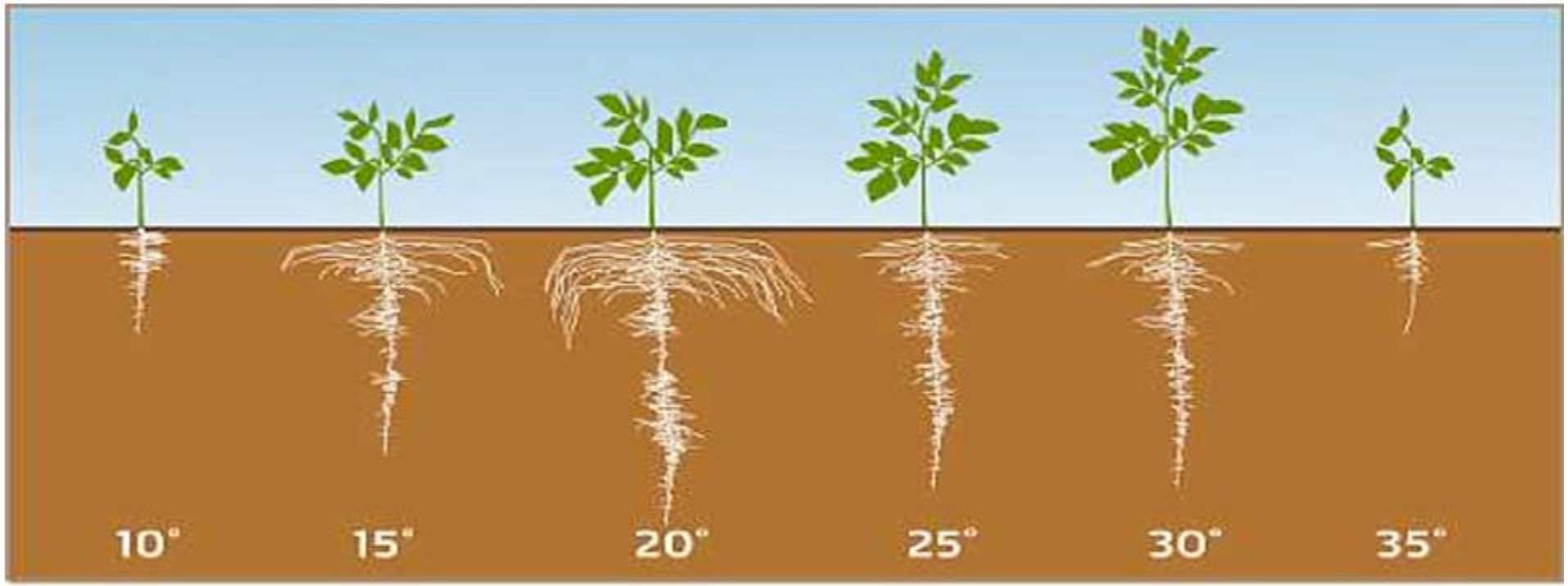
Potato Plant Properties

Potatoes are a shallow-rooted crop



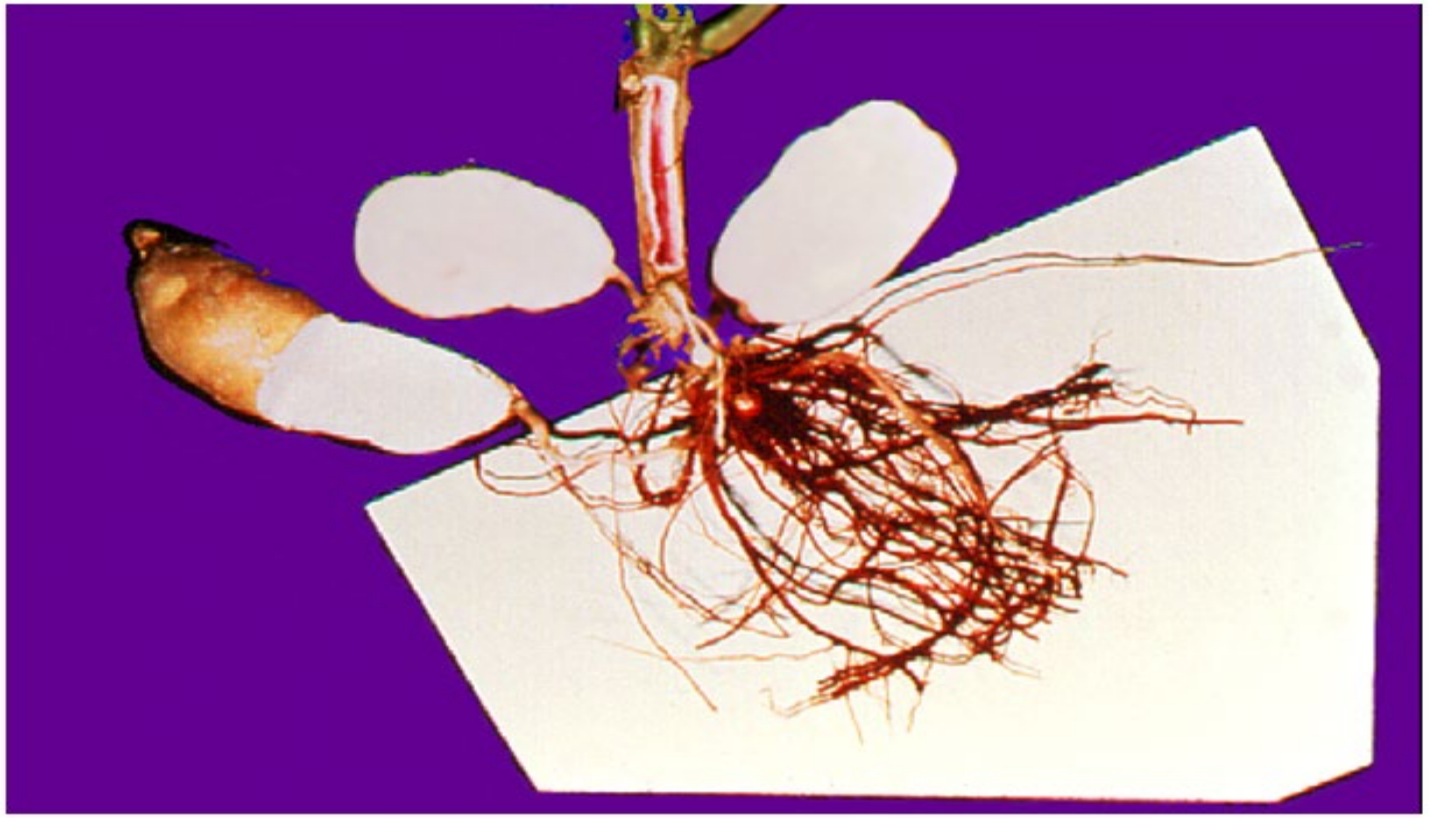


Soil Temperature Influences Root-Shoot Growth



Potato Roots – Main Roots

- (Water travels up into stem and not into stolon/tuber roots)

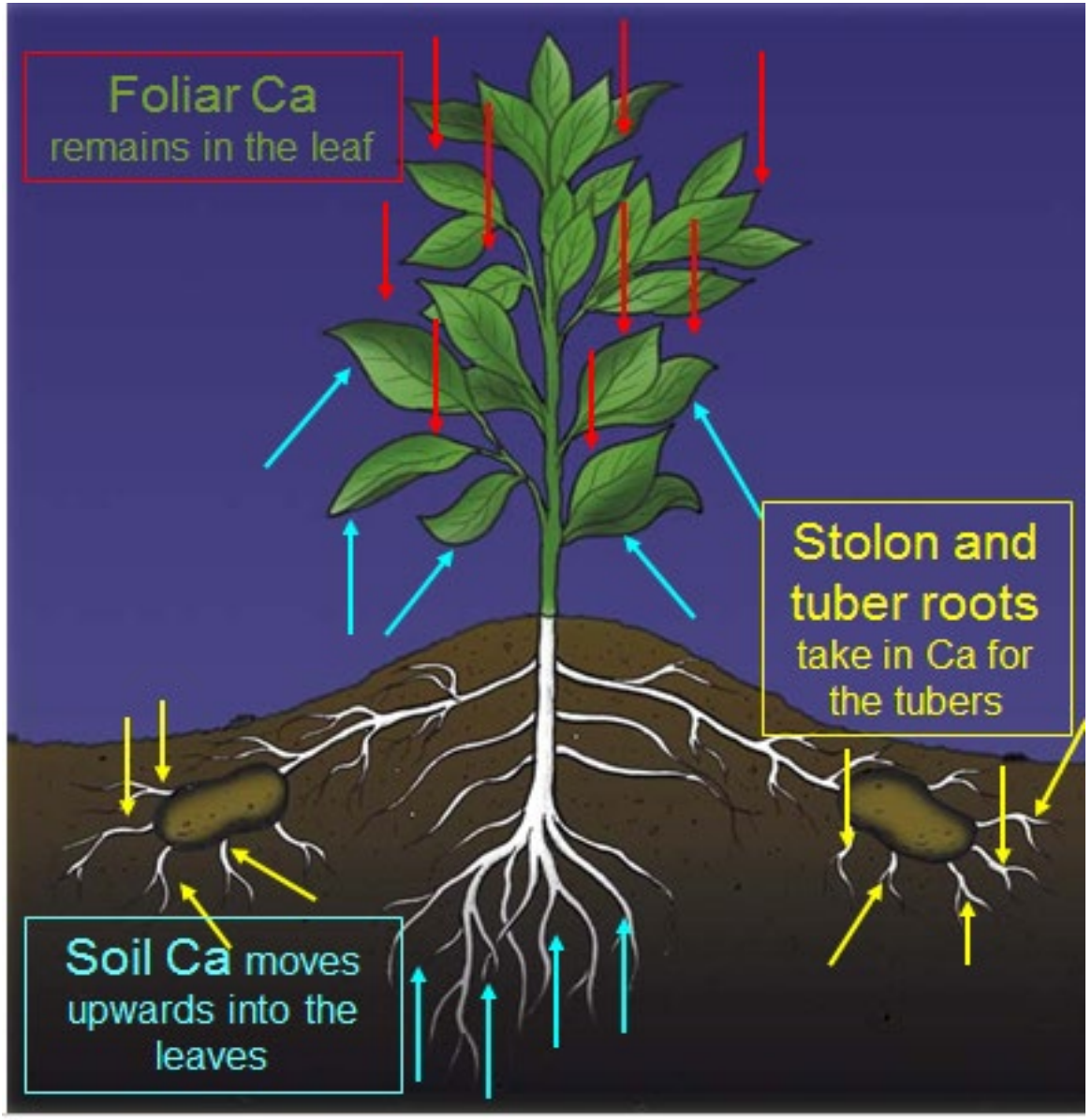


Stolon – Tuber Connection

Stolon/Tuber Roots Take Up Water

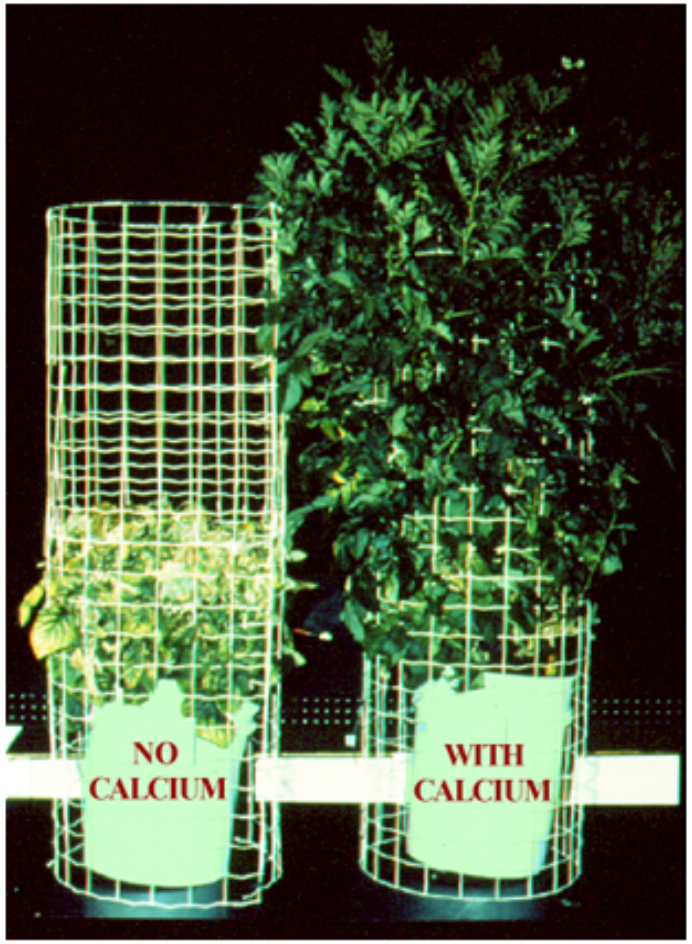
Into the Tuber

Calcium Uptake into the potato plant/tuber

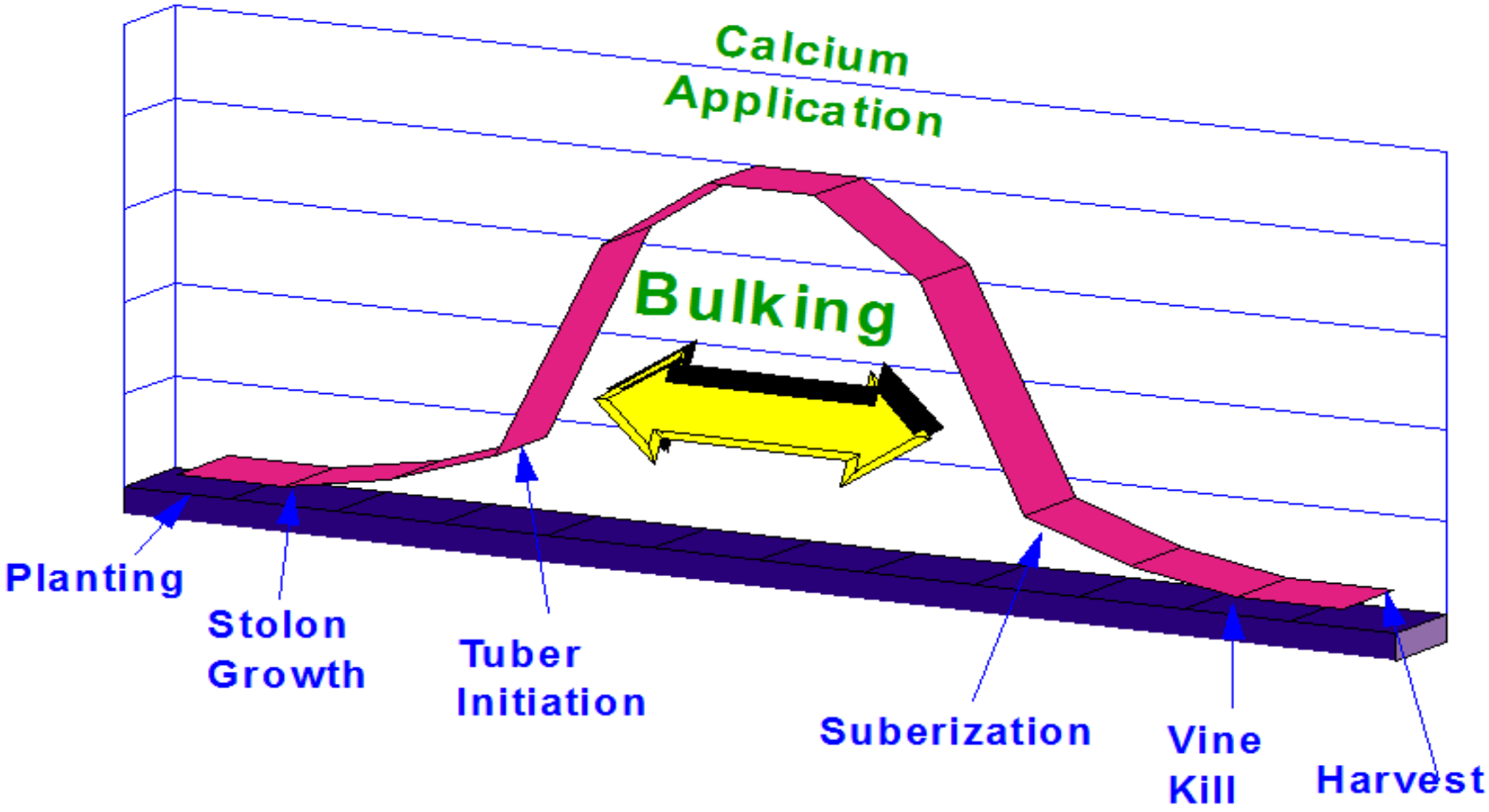


Calcium and potato plant heat stress (35° C)

- Biotron studies from the University of Wisconsin show that:
  - Plants with Ca produced 1.0 kg of tubers / plant
  - Plants without calcium were heat stressed and produced 0.7 kg of tubers / plant
- A yield reduction of 30%

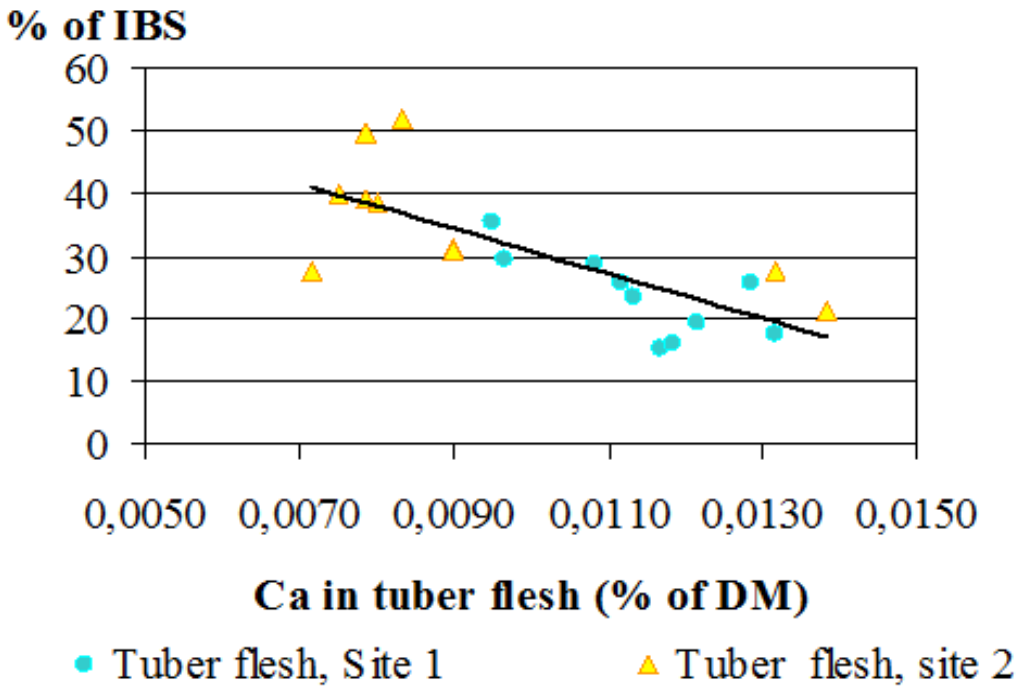


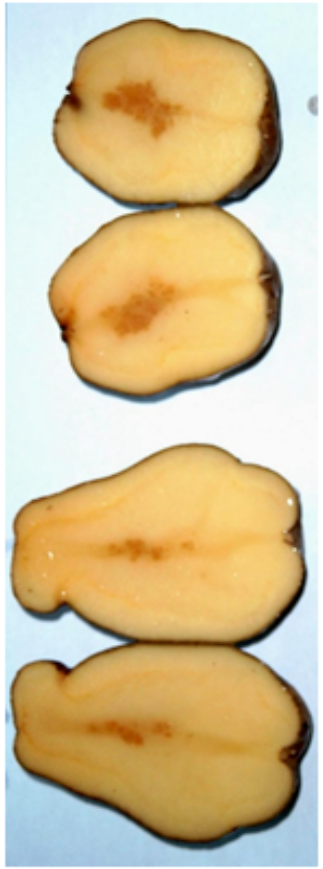
Tuber Calcium Uptake is Specific for Select Physiological Development Periods



Calcium & Internal Brown Spot (IBS) (University of Gottingen – Germany)

- **Ca in the inner part of tubers:**
  Slight variations can make the difference



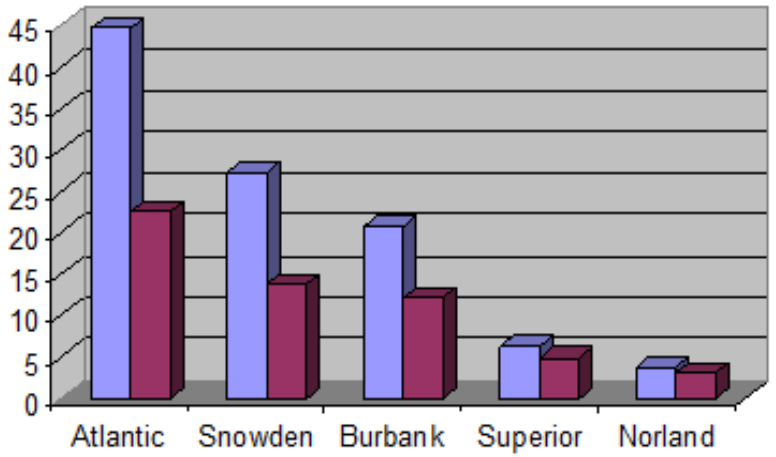


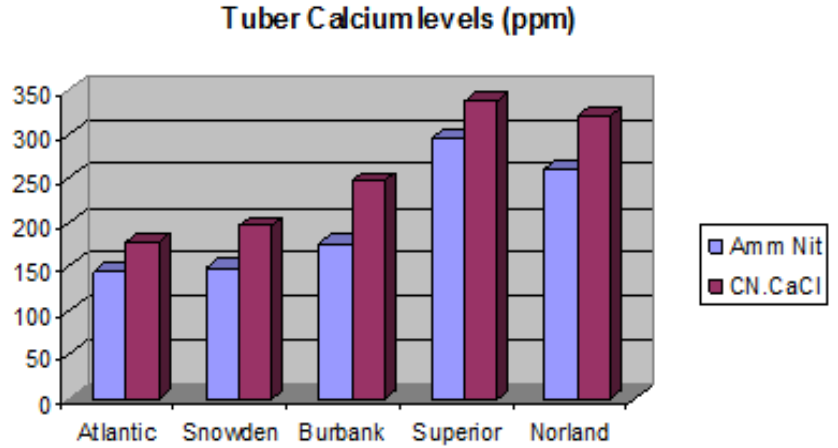
Calcium and seed potato quality

Calcium reduces bruising during harvest

- All varieties increased in calcium
- All varieties had less bruising

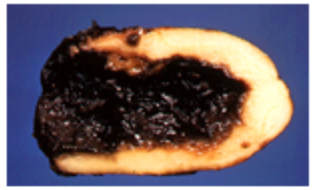
  - **Ca @ 165 kg/ha**
  - **Combination of CN & CaCl**





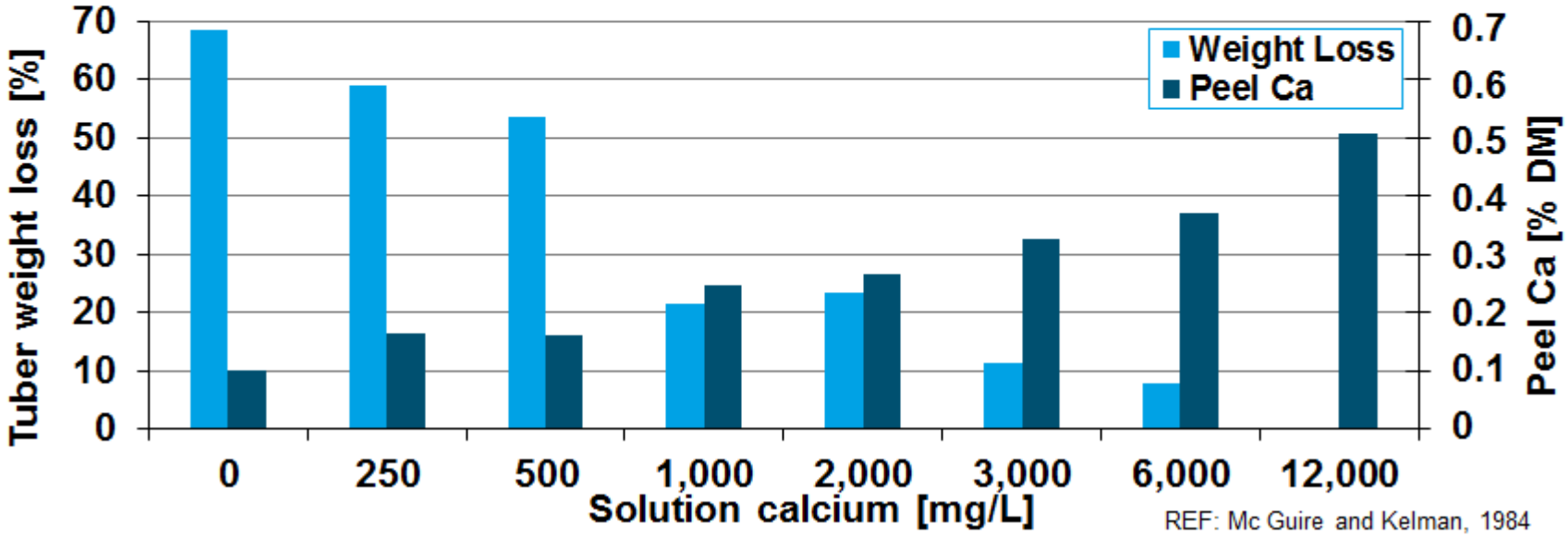
Karlsson & Palta
Uni. Of Wisconsin, 2001

Calcium reduces storage rot



Increasing calcium in peel from 0.1 to 0.5 % Ca

- Decreases soft rot infection (shown as weight loss)
- Tuber weight loss increases with increasing infection rate of Erwinia



REF: Mc Guire and Kelman, 1984

Nitrogen Form influences yield

"Avoid using nitrate products as the sole nitrogen source. Instead, include materials that contain ammonium forms of nitrogen, especially for early-season applications. Fertilizers containing ammonium produced higher yields and allowed greater recovery of applied nitrogen than an all-nitrate program."

Nitrogen application timing and placement

- Split applications
  - Emergence
  - Hilling
  - Bulking

"Considerable research has compared the timing of nitrogen applications in potato production. These studies have found that applying one-third to one-half of the nitrogen at emergence improves yield and/or quality. Splitting nitrogen applications generally provides an advantage over a single application.

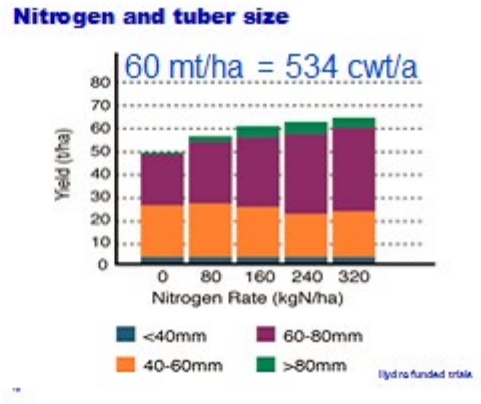
Wolkowski, Kelling and Bundy, Univ. of WI Ext. Pub. A3634

Nitrogen Rate

- For yield
  - more nitrogen
  - higher yields

"For a potato tuber yield goal of 451-600 cwt/a, one should apply 200 lbs. N/a on sandy soils with low organic matter."

Kelling et al., Univ. of WI Extension publication A2809

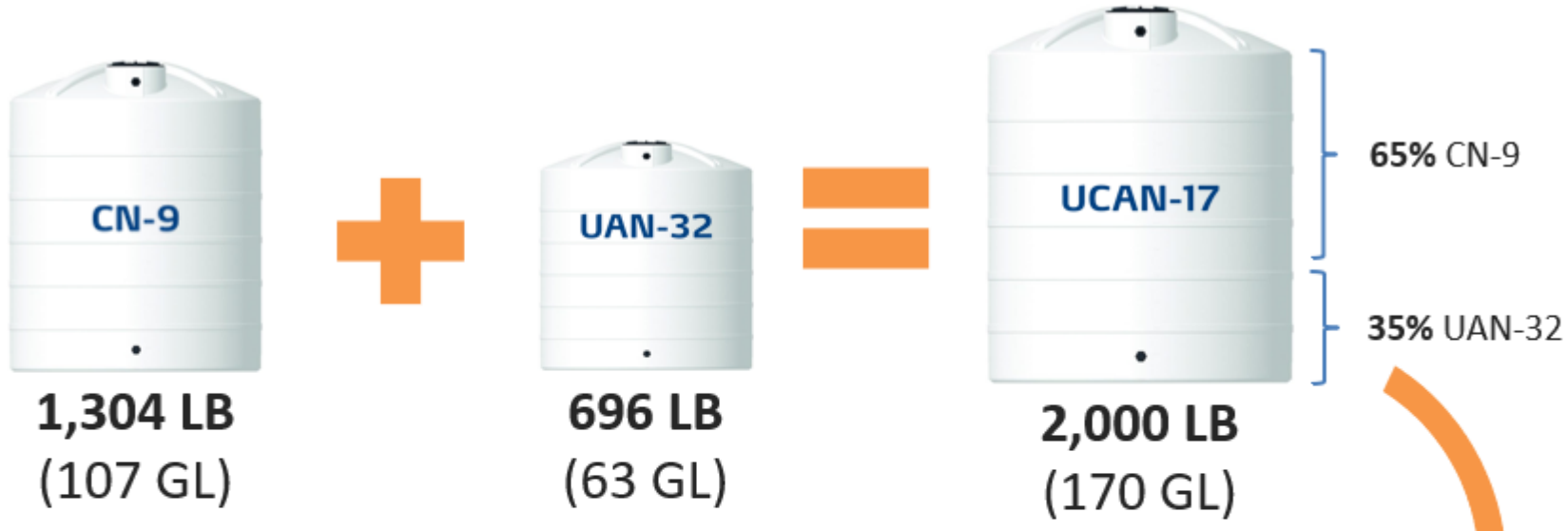


What was “Under the hood”?

- Nitrogen Source: Potatoes respond favorably to an ammonium nitrate N source applied in split applications.
- Potato Plants/Tubers require Ca to produce high yielding quality produce:
    - To reduce potato plant heat stress
    - To limit tuber imperfections such as IBS
    - To produce high yielding seed potatoes
    - To reduce bruising during harvest
    - To control tuber storage rot

UCAN-17: The perfect enhanced efficiency fluid fertilizer (fuel) for potato performance

UCAN 17 can be manufactured by simply blending two commercial fluid fertilizers



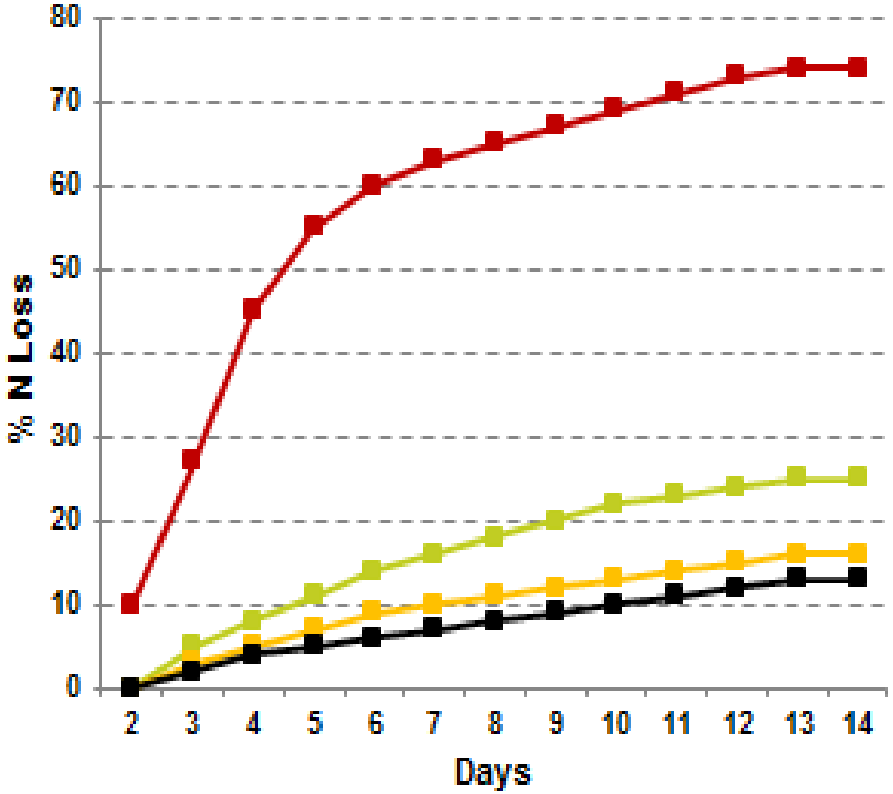
Nitrogen Forms

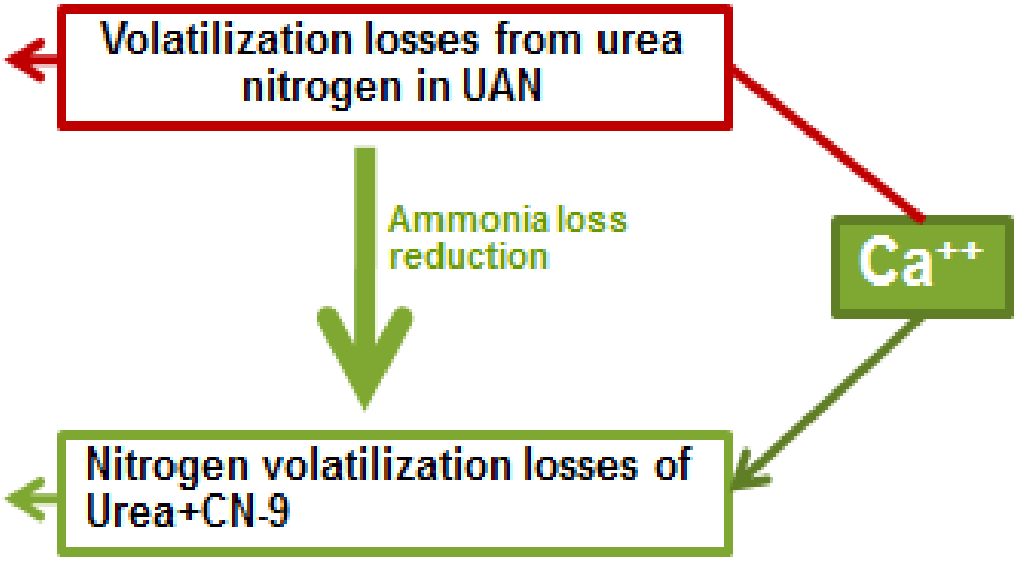
Ammoniacal	Nitrate	Urea
19%	49%	32%

Total N	Total Ca
17.0%	7.2%

17% N x 0.32 =5.44% Urea N
7.2% Ca/5.44 = 1.32 Ca/urea ratio

Enhanced efficiency is from suppression of NH_3^0 volatilization by the Ca/Urea N RATIO





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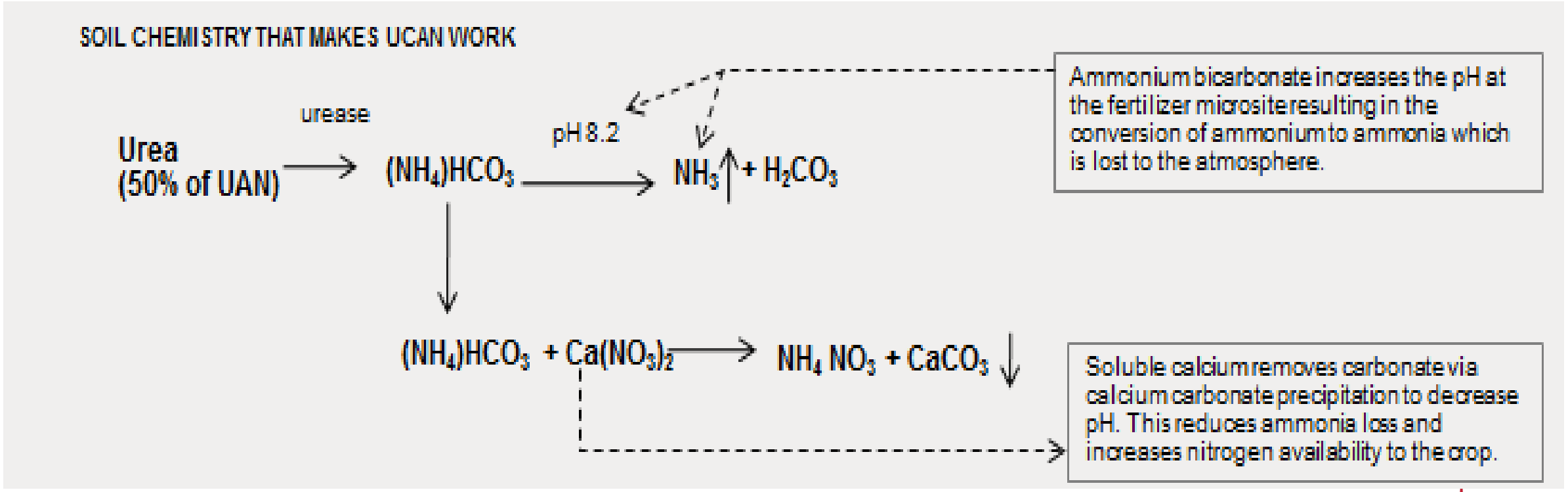

Benefits of UCAN 17 for Potato Fertilization/Fertigation

- Will perform like ammonium nitrate
- Has enhanced efficiency properties recognized by AAPFCO (State Fertilizer Control Officials/Regulators)
- Supplies both N and water-soluble Ca in optimal N:Ca ratios to plant and tuber
- Via fertigation, allows spoon-feeding of plant and tuber even after row closure.


YARA
Thank you for your attention!