



Strengthening Organic Sweetpotato Propagation Systems in the North Central Region



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Introduction: Sweetpotato (*Ipomoea batatas*)

- Growing demand for local, organic vegetables.
 - Nutritional benefits
 - Flavor
 - Versatility
 - Shelf-life
- Consumption ↑ 80% between 2000-2014
- 7.5 lbs. annual per capita
- Easily grown in variety of climates and soils types



FIBER	4 g
PROTEIN	2 g
VITAMINS	A (22,000 IU) C (22 mg) B6 (0.3 mg)
MINERALS	Potassium (542 mg) Calcium (43 mg) Magnesium (31 mg) Manganese (0.57 mg)
FAT	0 g



WHAT MINERALS ARE GOOD FOR:

- **Potassium & Magnesium:** Blood Pressure
- **Calcium & Magnesium:** Healthy bones
- **Manganese:** Wound healing & metabolism



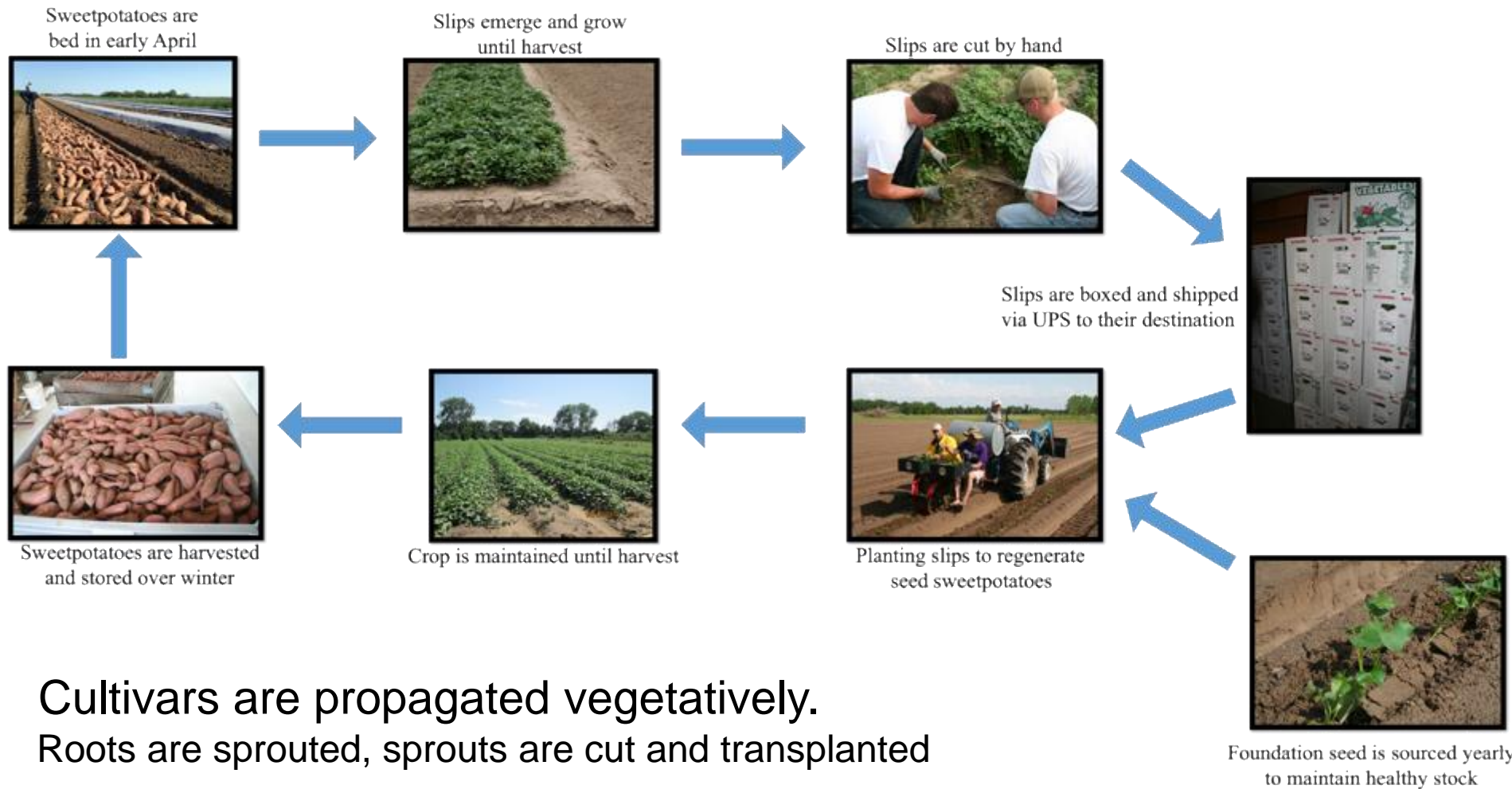
WHAT VITAMINS ARE GOOD FOR:

- **Vitamin A:** Eye health
- **Vitamin C:** Immune system
- **Vitamin B6:** Metabolism & nervous system

The antioxidants in vitamins A and C and manganese guard cells against carcinogens and toxins.

Source: Ag Marketing Resource Center

Propagation Cycle



Sweetpotato Propagation “slips”

- Tropical crop: no frost tolerance, needs warm soils
- Slip production that fits planting schedule is a challenge in North Central Region.
 - Regional growers often buy slips from Southeastern U.S.
- **Cost of buying slips** remains single biggest expense for growers
- **High-tunnel production** represents promising alternative





NCR-SARE GRANT

KSU was awarded funding in 2015 for a 3-year study of Regional Sweetpotato Propagation Systems.



Overall Objectives:

- ***Define best management practices for high tunnel production of sweetpotato slips***
- Outline economic feasibility of the high tunnel slip propagation system
- Develop recommended postharvest (e.g. MAP) technologies to extend slip storage/shipping life
- Conduct field days and extension bulletins to highlight the results of the project

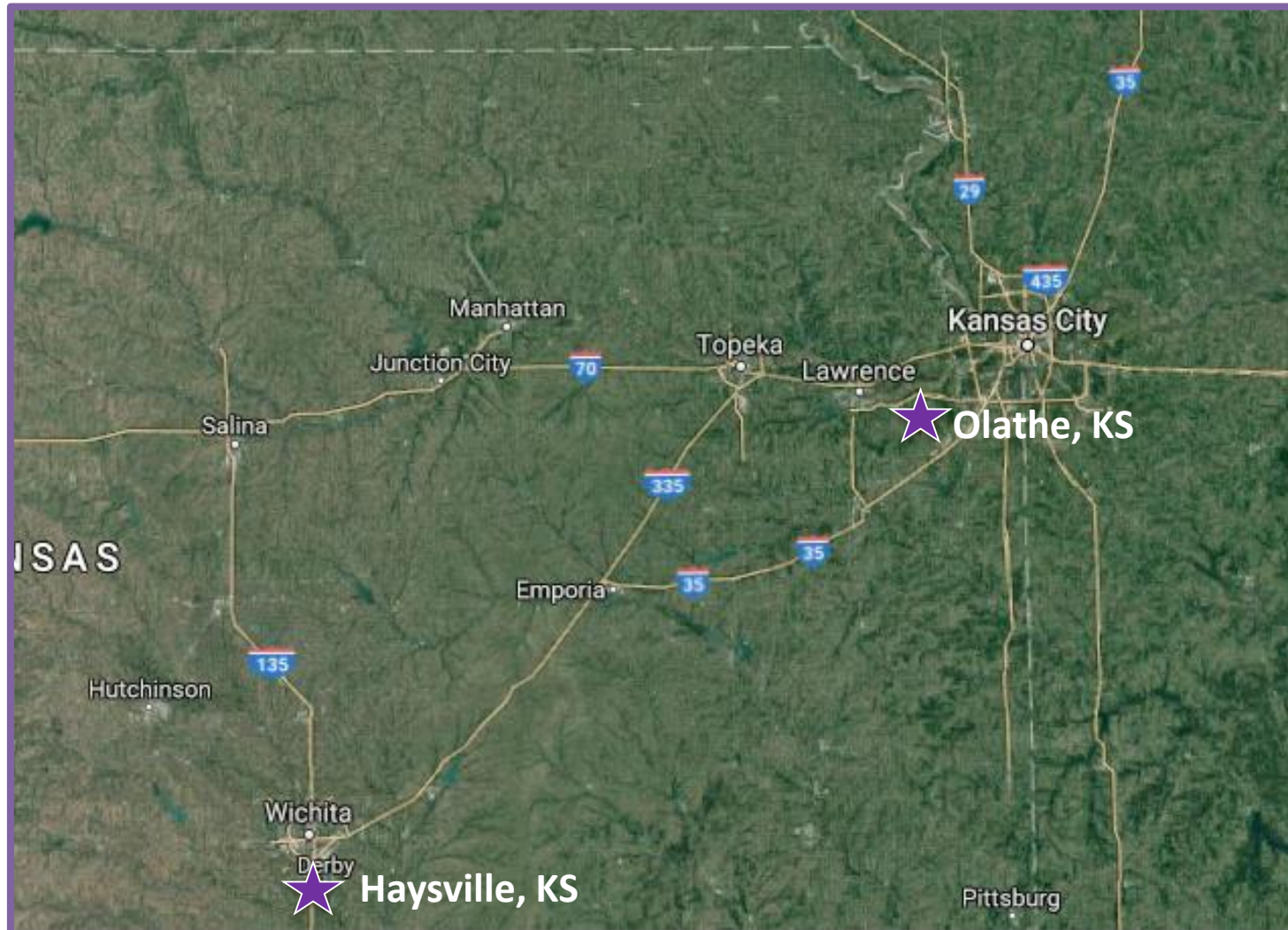
High Tunnel Crop Value Comparison

Crop Type	Rotation interval	Sale Price/unit	Gross Revenue/ft ²
OG Sweetpotato Slips	04/15-05/30	\$130/1000 slips	\$5.37
Tomato	04/01-10/01	\$2.50/lb	\$3.66
Cucumber	04/15-07/15	\$1.50/lb	\$1.62
Bell Pepper	04/15-10/01	\$1.50/lb	\$2.30
Salad Mix	02/15-05/01	\$8/lb	\$2.40

Based on enterprise budgets from KRC *Growing Under Cover* v2 Dec. 2016



Trial Locations



Experimental Design (1)

- **Randomized Complete Block Design @ John C. Pair Center**
 - Comparing yields & physical characteristics of slips grown in High Tunnels (HT) v. Open-Field (OF).
 - 4 replicated HT plots and 4 OF



Experimental Design (2)

- **Split Plot Design @ Olathe Hort. Research & Extension Center**
 - Main plots 6 HT v. 6 OF
 - 3 subplot treatments comparing seed root planting density effects on slip yield (45, 65, 85)
 - Replicated 6 times in HT and OF



Materials and Methods

Sweetpotatoes are placed in ground and covered with 2-3" soil and clear plastic. Mid to late Spring.

About 4 weeks later when we see the slips breaking the surface, we remove the plastic.

Start cutting when they reach 8" – 12"



Data collection

Slip Yield / m²

- **Total Marketable #**
- Total Marketable Weight g
- Total Cull Weight g
- Total Marketable dry weight (g)
- Total Cull dry weight (g)

Slip Characteristics

- Fresh Weight (g)
- Dry Weight (g)
- Leaf Area cm²
- Stem Diameter
- Length cm
- # of Nodes
- **Compactness (dry weight/length)**



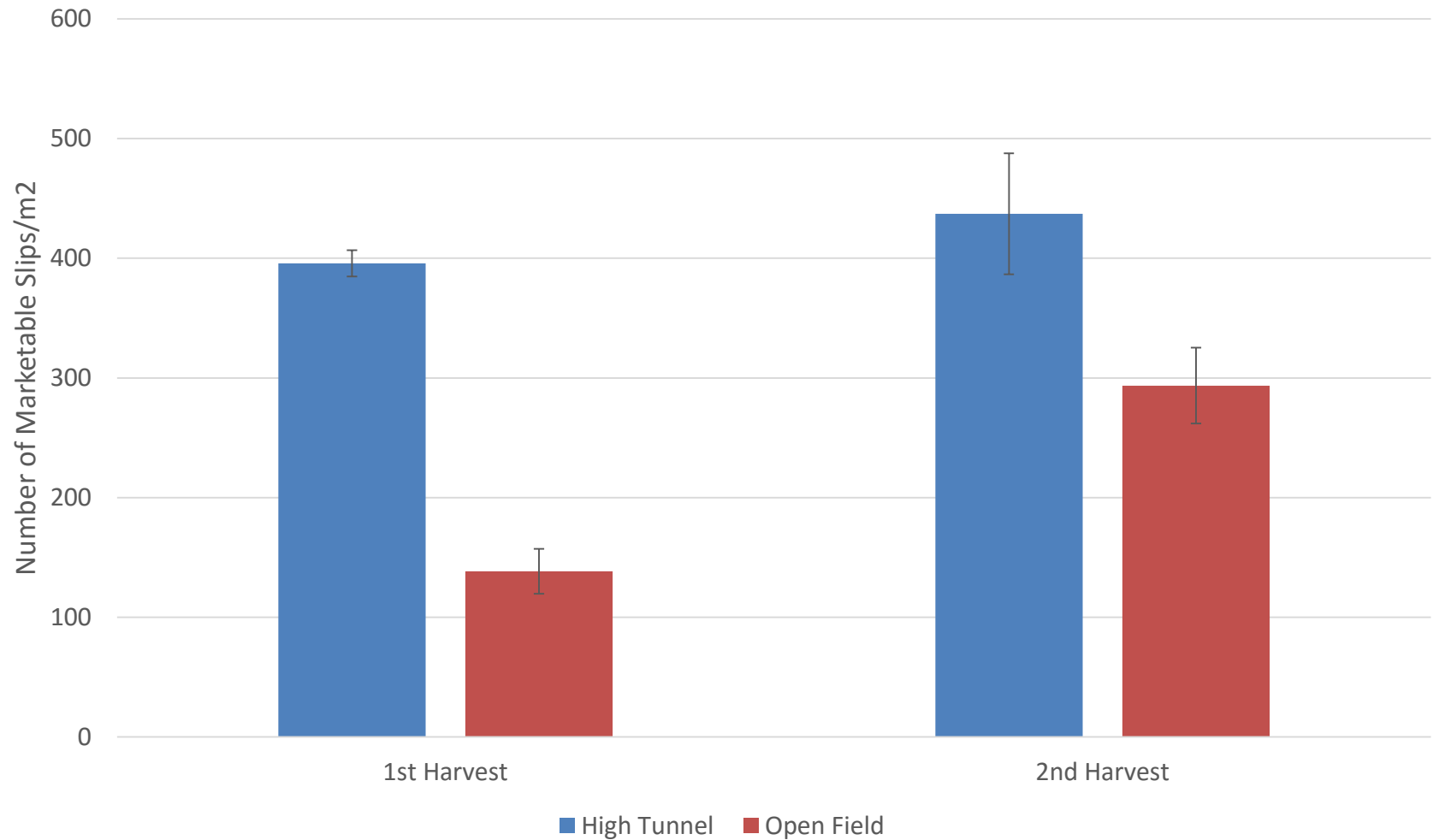
Field Study (Edible Root production)

- **RCBD @ the OHREC**
 - Comparing slip growing environment impact on root yield
 - 4 treatments JCP & OHREC HT vs. OF

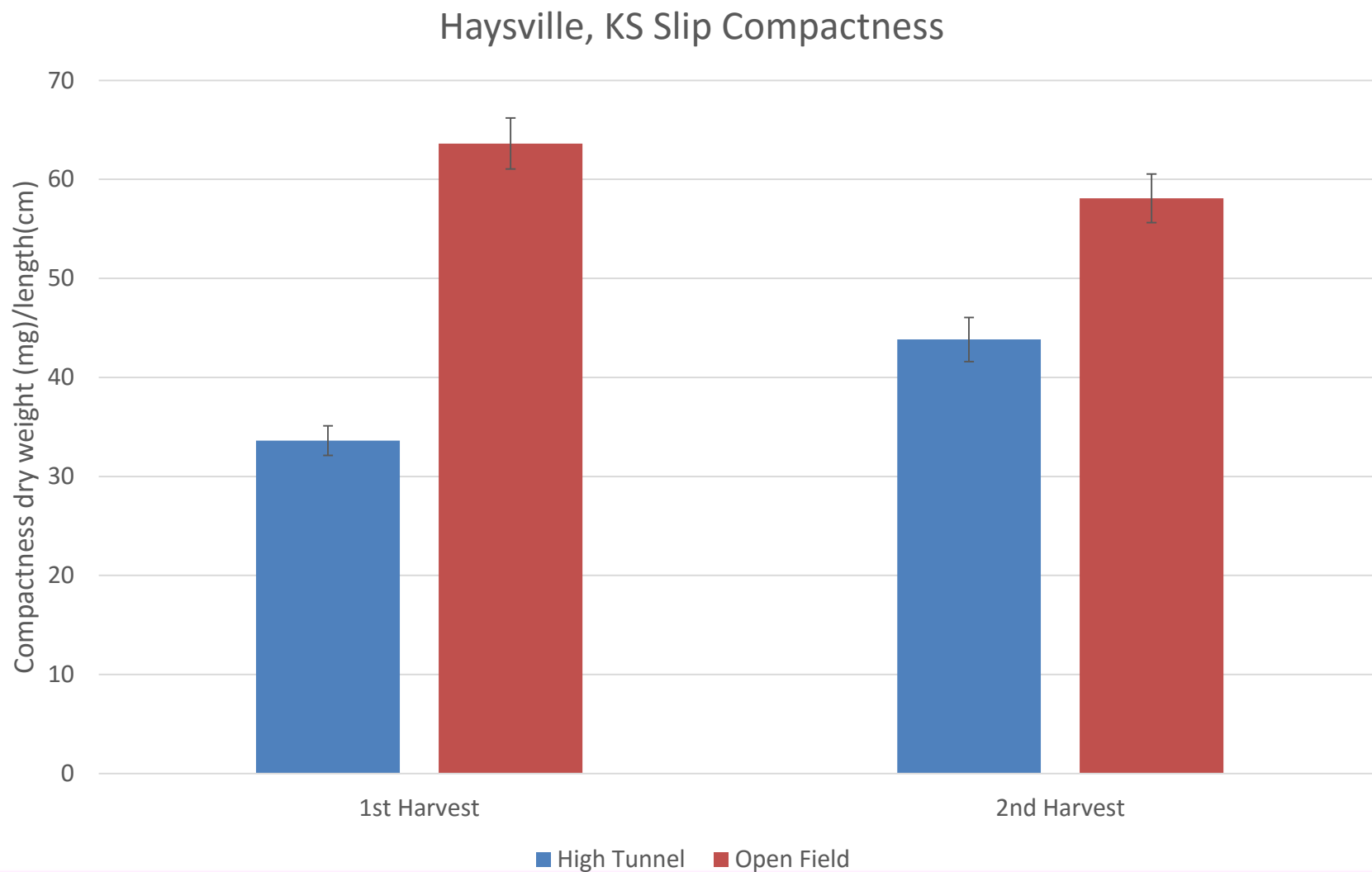


Marketable Yields

Haysville, KS Marketable Slip Yields

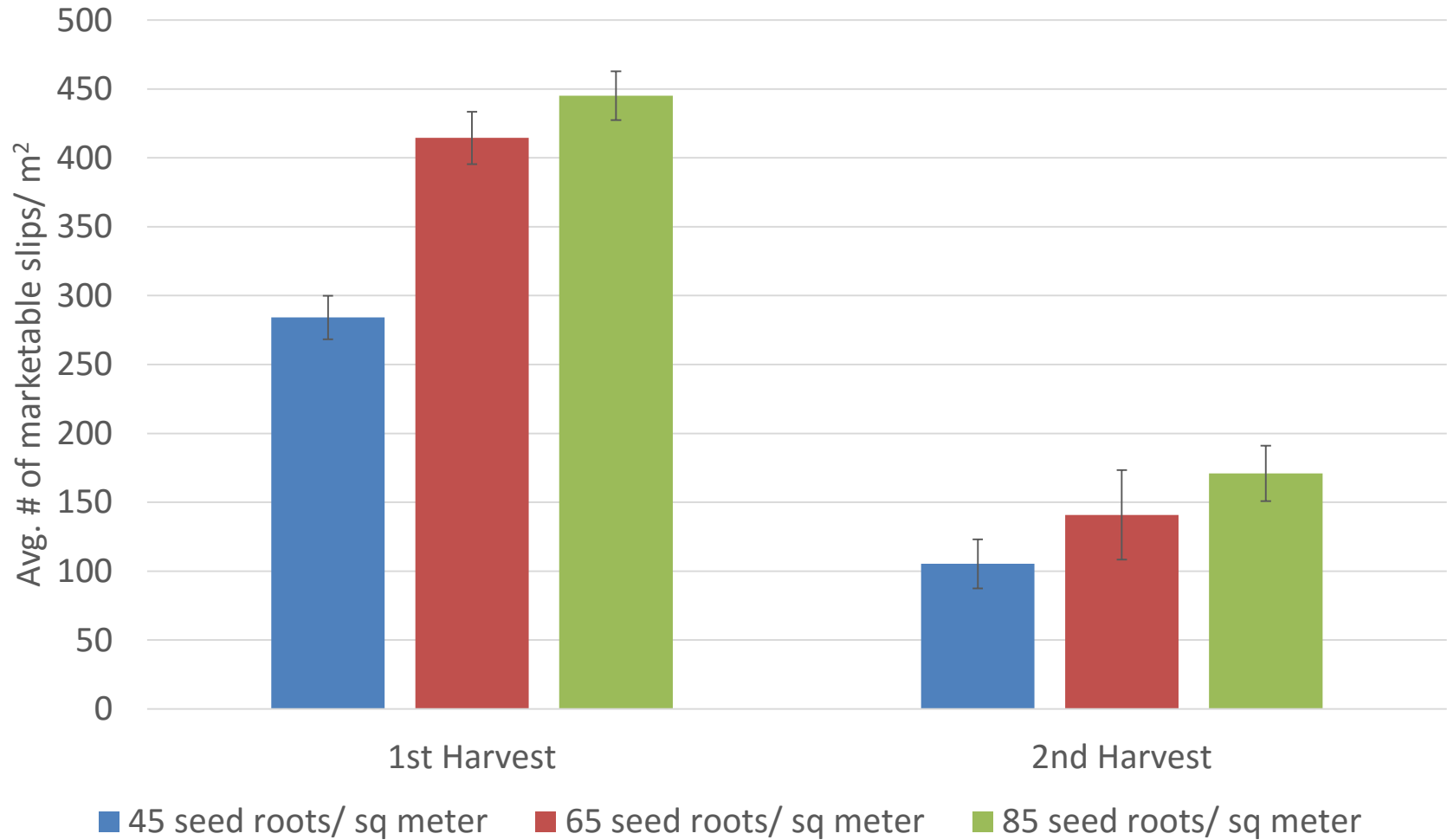


Slip Compactness



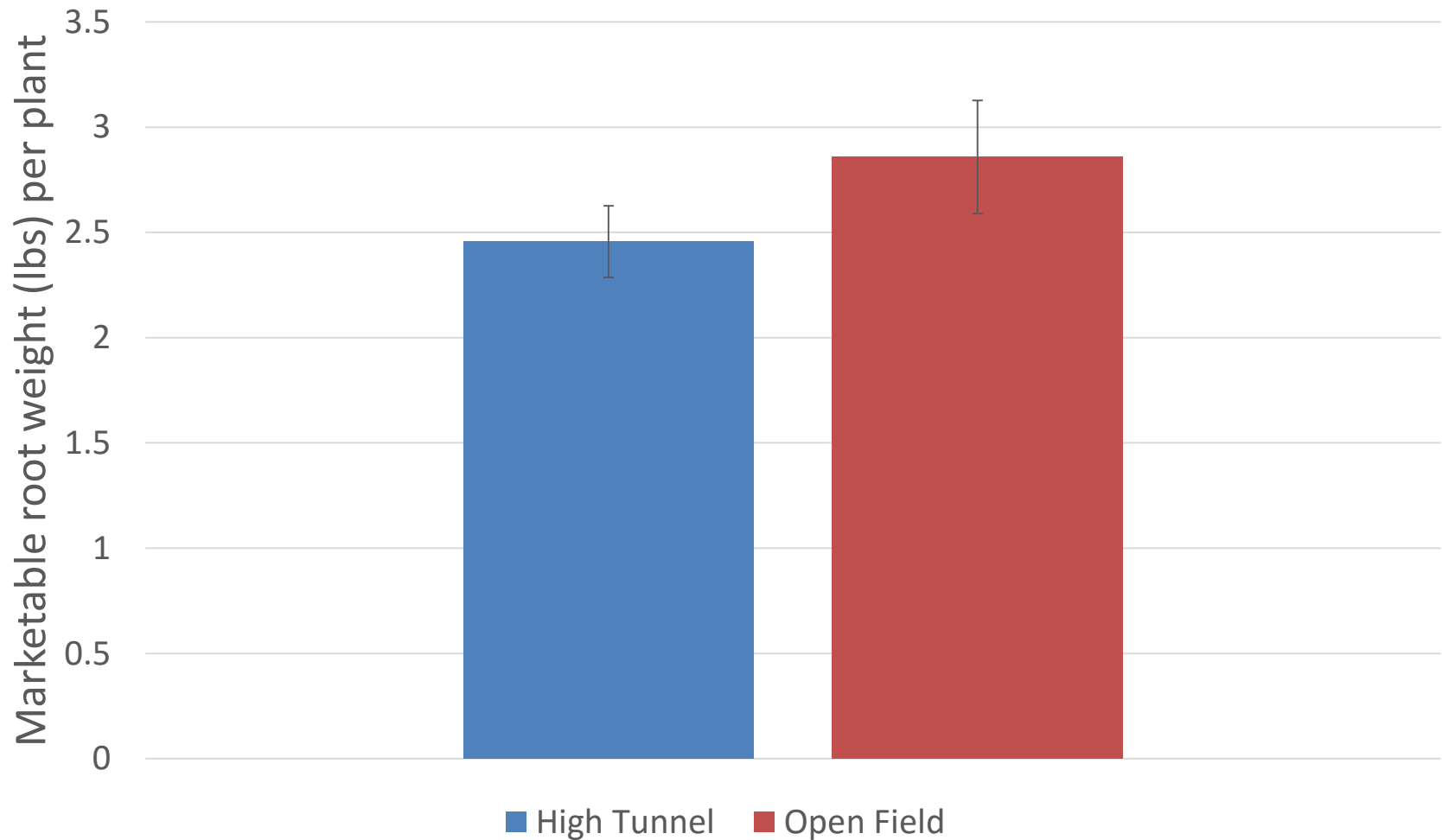
Planting Density

Marketable Slips by Seed Root planting density (high tunnel)

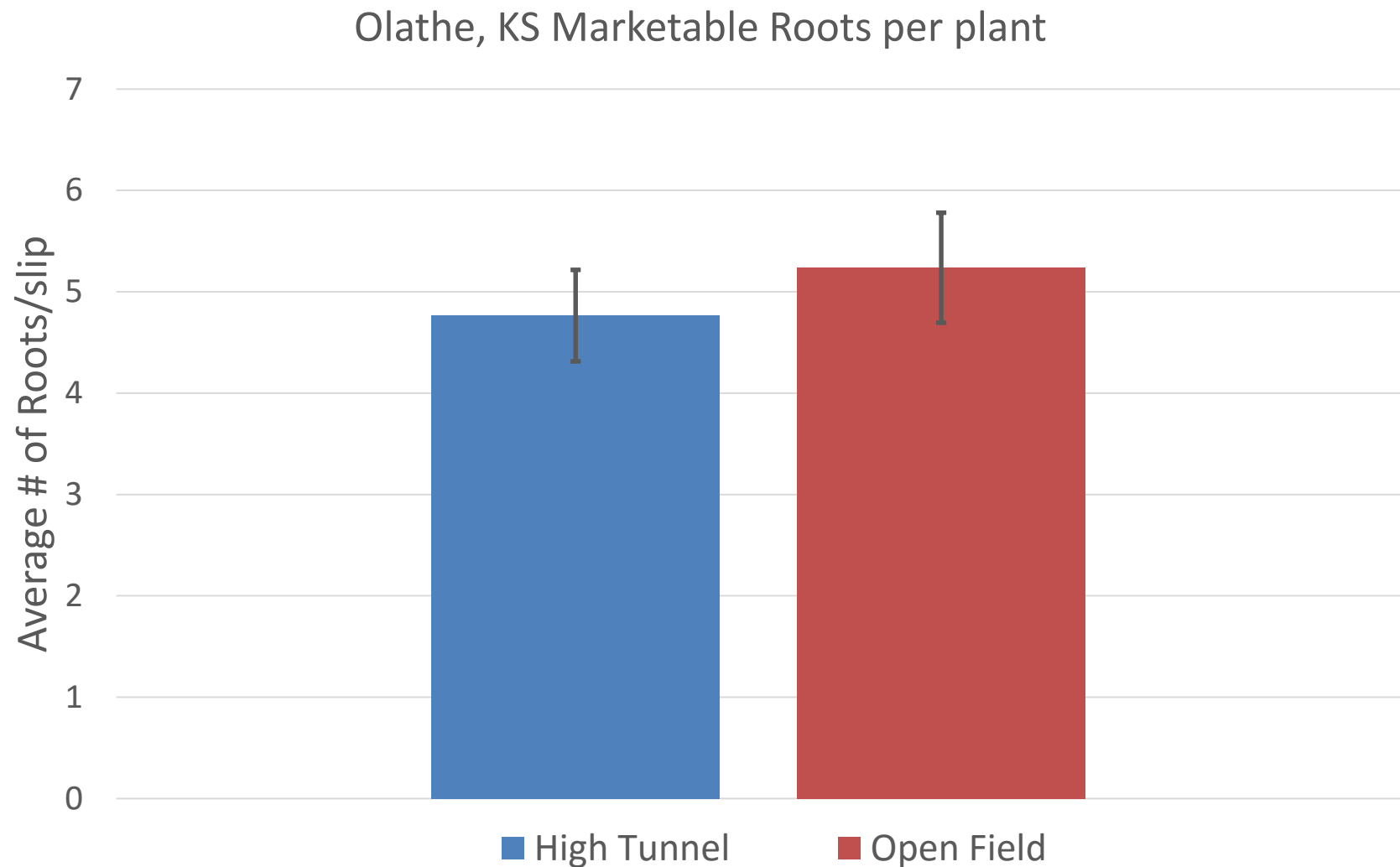


Slip Origin Impact: Weight per plant

Olathe, KS Average Marketable Weight

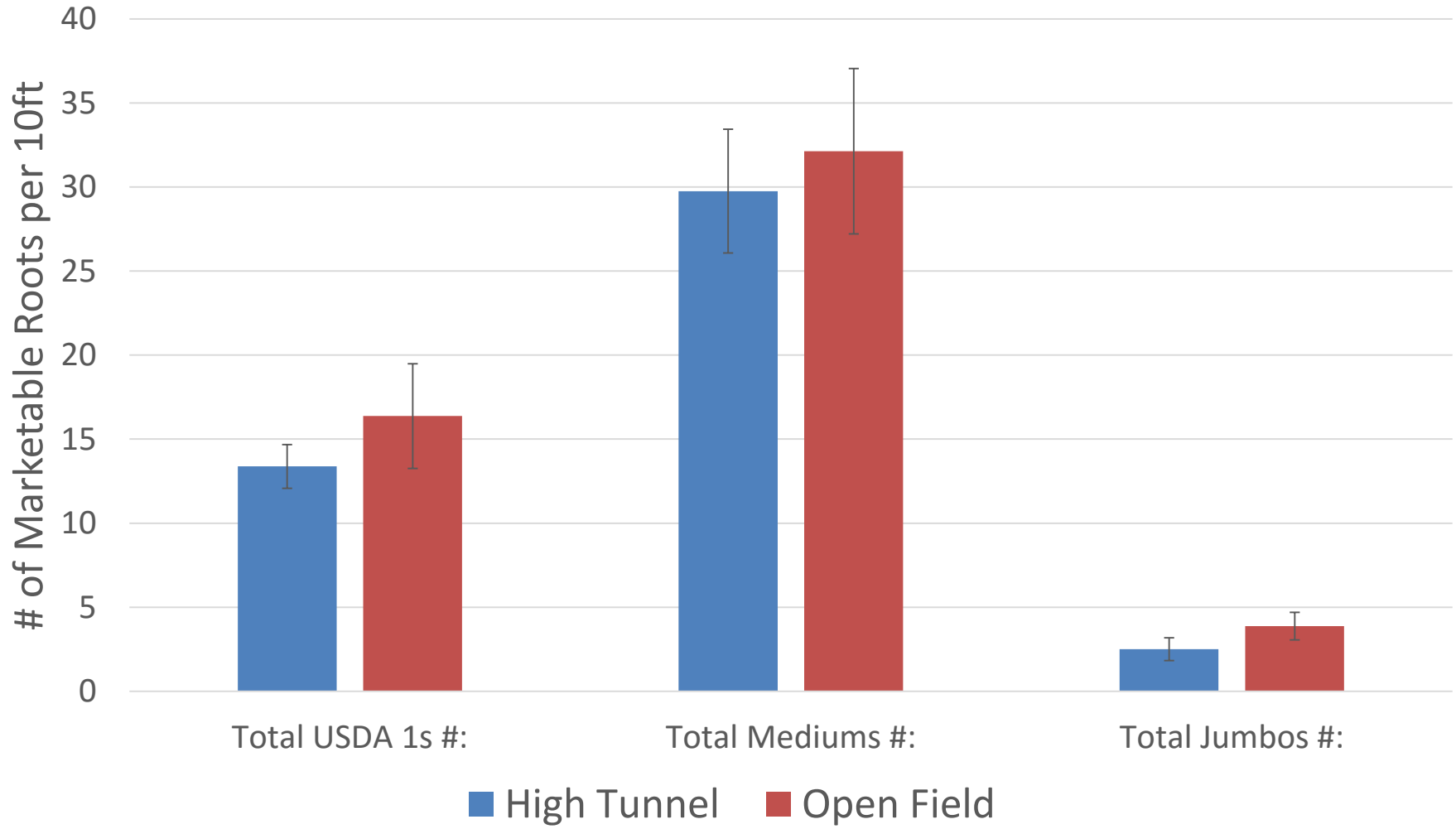


Slip Origin Impact: Roots per plant



Slip Origin Impact

Marketable Root Yields by Grade



Preliminary Conclusions

Yield: HT vs. OF

- High tunnels average greater # of marketable slips

Physical Characteristics

- Open field treatment resulted in greater slip compactness

Slip Origin Impact

- Little correlation to greater root yield

Planting Density

- Marginal difference in slip yields at 65 v. 85 roots/m²

Thank You. Questions?

- Thank you:



- Great Plains Growers Conference & Attendees



- Funders NCR-SARE & KCSAAC



- KSU and Horticulture & Natural Resources Dept. & Faculty

- KSU Hort. Research Center Staff and Interns

