

# HOW THE RIGHT PHOSPHORUS RATE INFLUENCES THE YIELD OF LETTUCE



#### Shabnam Sadeghibaniani<sup>1</sup>

Jairo Arcos Jaramillo<sup>1</sup>, Jesse Murray<sup>1</sup>, Byron Manzanero<sup>1</sup>, Lidysce Cantarero<sup>1</sup>, Amanda Carroll<sup>1</sup>, Heriberto Trevino<sup>1</sup>, Jehangir Bhadha<sup>1</sup>, Steven Sargent<sup>2</sup> and Germán Sandoya<sup>1</sup>

1 Everglades Research and Education Center, University of Florida IFAS, Belle Glade, Florida 2 Horticulture Sciences Department, University of Florida IFAS, Gainesville, Florida

## WHY PHOSPHORUS (P) IS IMPORTANT IN SOIL?

- Lettuce Learn! 🕤
- Phosphorus is essential for:
  - Plant growth and development

- Photosynthesis and respiration
  Cell division and genetic function (DNA & RNA)
  Regulating metabolism (Enzyme Activation)
- Root development and nutrient uptake
- Seeding, flowering, and fruit production THE GOLDILOCKS' PRINCIPLES
- Not Too Little (P Deficiency):
- Stunted Growth
- Dark Green or Purplish Leaves: Older leaves
- Delayed Maturity: Slow leaf expansion and delayed harvest
- Weak Root System: Less efficient in nutrient and water uptake
- Reduced Yield: Smaller heads with lower market value

## Not Too Much (Excessive P):

• Nutrient Imbalance: Reduces the availability of other nutrients like zinc, iron, and manganese which reduces lettuce quality

#### FINDING THE SWEET SPOT FOR P



#### BEST MANAGEMENT PRACTICES

## What Do Soil Scientists Do?

- Soil tests to determines P-fertilizer need for lettuce
- Field trials are conducted across multiple seasons and locations to determine the best P-fertilizer rate
- Use predictive models to correlate soil and leaf P concentrations
- The correct P recommendation will ensure the best lettuce yield under sustainable practices
- Soil scientists and Farmers work together to

#### 4 Rs + Irrigation

Right Source Right Place Right Rate Right Time Irrigation





## increase food production while protecting the environment for a sustainable future

#### Acknowledgments:

• The University of Florida, IFAS, Horticulture Science

#### Department

• UF/IFAS Everglades Research and Education Center





 Funding Source: UF/IFAS Fertilizer Rate and Nutrient Management Studies, HB 5001 and SB 1000 (FY2022-23 continuation) and SB 2500 (FY2023-24)