

### For The Soil | For The Plant | For the Future

# Potatoes

## How are Potatoes Used?

Potato Utilization (%), 2007





# **Preferred Growing Conditions for Potato**

- Deep, well drained soil
- High water holding capacity (without becoming saturated)
  - Soils with high clay content require special management to maintain water drainage and soil structure
- Peat or muck soils are good if they are adequately drained
- Sandy soils require proper irrigation and fertilization
  - Produce high yields with good quality
- Potatoes are tolerant to low pH soils
  - Reduced incidence of common scab in soils with pH<5.4
  - Scab resistant varieties perform well in higher pH soils



# Low pH Soils can Limit Nutrient Uptake



Reduced availability of N, P, K, S, Ca and Mg

Increased availability of AI (can be toxic)



## **Potato Plant Part Description**





## **Potato Growth Stages**



#### **GROWTH STAGE** Sprout development

Sprouts develop from eyes on seed tubers and grow upward to emerge from the soil

Roots begin to develop at the base of emerging sprouts

#### **GROWTH STAGE II** Vegetative growth

Leaves and branch stems develop from aboveground nodes along emerged sprouts

Roots and stolons develop at belowground nodes

Photosynthesis begins

#### **GROWTH STAGE III Tuber initiation**

Tubers form at stolon tips but are not yet appreciably enlarging

In most cultivars the end of this stage coincides with early flowering

#### **GROWTH STAGE IV** Tuber bulking

Tuber cells expand with the accumulation of water, nutrients, and carbohydrates

Tubers become the dominant site for deposition of carbohydrates and mobile inorganic nutrients

#### **GROWTH STAGE V** Maturation

Vines turn yellow and lose leaves, photosynthesis decreases, tuber growth slows, and vines eventually die

Tuber dry matter content reaches a maximum, and tuber skins set

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## **Potato Nutrient Needs**

	Tuber yield, cwt/A					
	Vines	200	300	400	500	600
Nutrient	Nutrient uptake Ib/A					
Nitrogen (N)	90	86	128	171	214	252
Phosphorus (P)	11	12	17	23	28	35
Potassium (K)	75	96	144	192	240	288
Calcium (Ca)	<mark>43</mark>	3.0	<mark>4.4</mark>	<mark>5.9</mark>	7.4	8.9
Magnesium (Mg)	25	5.9	8.9	11.8	14.7	17.6
Sulfur (S)	_	8.8	13.2	17.6	22.0	26.4
Zinc (Zn)	0.11	0.70	0.11	0. <mark>1</mark> 4	0.18	0.22
Manganese (Mn)	0.17	0.03	0.04	0.06	0.07	0.08
Iron (Fe)	2.21	0.53	0.79	1.06	1.32	1.58
Copper (Cu)	0.03	0.04	0.06	0.08	0.10	0.12
Boron (B)	0.14	0.03	0.04	0.05	0.06	0.07

Source: Univ. Minnesota



### **Potato Nutrient Need**

### Nitrogen:

- Peak demand 20 60 days after planting
- Later applications can delay maturity, poor skin quality

Phosphorus:

• Major role in tuber set

Potassium:

- Important in tuber yield, size, and quality
- Helps prevent bruising and improve storage quality

Calcium:

- Helps maintain storage quality
- Reduces hollow heart

### Total potato plant N, P, and K uptake at Aberdeen, 1991-93.



Source: Univ. Idaho



### **Pro-Germinator Performance**

## Basin Fertilizer, 2015

Pro-Germinator 7.5 gal/A vs.10-34-0 17 gal/AApplied through irrigation system

Yield (cwt/acre):

Pro-Germinator = 555

10-34-0 = 514

\$281 net increase in return (\$7/ cwt potato price)





# **AgroLiquid Performance**







### AgroLiquid: Pro-Germinator 8 gal/A (at planting)

- + Sure K 2 gal/A
- + Micro 500 0.5 gal/A
  - 32% UAN 10 gal/A (at hilling)

Conventional: 12-12-12 900 lb/A (broadcast and incorporated)



## **AgroLiquid Performance**



•In season applications of Nitrogen were pivot applied and identical for all treatments. \*Full ACLF Program = average of 2010 & 2011 data only



# **PrimAgro Products on Potatoes**



Pro-Germinator, Kalibrate, PrimAgro P, or PrimAgro K applied at 5 gal/acre at planting. C-Tech Applied at 0.5 gal/acre at side dress.



474

CWt./acre