

(Rates Based on Per Acre)

Potatoes can be grown on a wide variety of soils, although they grow best in soils with a pH between 5.5 and 6.2. As soil pH becomes more alkaline, skin quality and micronutrient deficiencies become more likely. They are especially sensitive to Chloride which can cause leaf scorch, yellowing and distortion. Boron deficiency can add to hollow heart.

There are five distinct stages in a potato plant's life, with each stage having specific nutrient and water requirements. By addressing these requirements, the potato plant can be steered toward high production of the best quality tubers. These stages are:

Stage 1, Sprout development: The sprout develops from eyes on the tuber and emerges from the soil. Roots have begun to form at the base of these sprouts. Consistent soil moisture is necessary to get the most even sprouting. Minimal added nutrition is needed in this stage, and our research has shown that avoiding high levels of nutrient availability can help control the number of viable sprouts (stems). When growing potatoes for the baking market, size is essential and a high number of tubers can be a potential negative. Population has also shown to have an impact upon the overall number of stems that initiate and/or produce marketable tubers.

Stage 2, Vegetative growth: During vegetative growth leaves and branches form. Stolons develop from below ground nodes. Nitrogen demand is relatively high at this stage in order to support vegetative growth. As with the number of stems, the number of stolons will impact future management decisions and fertility requirements. Fewer stolons will result in fewer tubers, which makes it easier to achieve a larger size tuber.

Stage 3, Tuber initiation: Tubers begin to swell at stolon tips. Generally, flowers begin to develop at this same time. The plants begin to heavily consume K, Ca, and Mg.

Stage 4, Tuber bulking: Tubers expand rapidly as does the demand for potassium, calcium, magnesium and micronutrients. It is at this stage that the potential for hollow heart is greatest. Weather and/or moisture stress followed by good growing weather will often cause hollow heart. Water and heat are the two greatest stress factors, so manage soil moisture as consistently as possible.

Stage 5, Maturation: Although defoliation is required in some areas, in other areas the vines are allowed to turn yellow and lose their leaves naturally as the tubers reach mature size. In the final stage, the vines die and tuber skins set. When defoliation is part of the management program, or when weather is not conducive to vines drying out quickly, then skin set can be a primary issue.

Dry or Bulk Fertilizer: Overall seasonal nutritional requirements for potatoes are 125 - 150 units of N, 150 units P, and 200 - 400 units K. Potatoes greatly prefer high levels of nitrate-N, rather than ammoniacal-N, as nitrate encourages the uptake of K, Ca and Mg. Apply 200 pounds $MgSO_4$ (Epsom salts preplant). In sandy soils, apply only about 30% of these nutrients preplant with the remainder applied evenly over the growing season prior to rows closing, or through fertigation. In heavier soils, apply up to 50% of these nutrients preplant with remainder applied over the growing season. With either soil type, apply another 100 units of K prior to the rows closing.

Potatoes are extremely heavy users of potassium. When trying to maximize production and quality, up to 400 units per acre (K) can be applied. Keep individual applications below 45 units K per application to avoid salt injury to developing sprouts. Higher K levels along with sufficient boron, calcium, and magnesium can help to reduce hollow heart. Higher levels will also increase specific gravity, an important measure of potato quality. Avoid KCL sources of potash.



Hollow heart is a serious disorder of potatoes that causes a hollow cavity inside the tuber. While research is ongoing, it is believed to be a stress disorder caused by some combination of insufficient B, high heat, insufficient or imbalance in K, Mg and Ca cations, and/or inconsistent soil moisture during tuber bulking. Potatoes consume nutrients so heavily during this period that it can be challenging to feed them enough.

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It should be noted that this program is presented as a guideline only based upon research and the experiences with a number of growers. With the wide variances possible from both soil types and environmental conditions present during any particular season, your actual recommendation can vary from what is presented. It is always advisable to discuss actual management practices with your local ISP specialist.

Bed Application Prior to Planting:

Prior to planting, 2 gallons PhytoGro Xtra. Research at the University of Idaho strongly indicates that humic materials (carbon) has a strong positive impact upon potential yield. PhytoGro should be broadcast or banded prior to final preparation of bed in order to concentrate the product into the bed itself.

The program in the table below is designed for most potato varieties with more or less average weather. Prolonged cool, cloudy periods will add days to this schedule, as extreme heat can shorten the schedule. Tissue testing biweekly can greatly improve overall yield and quality as potatoes are heavy feeders. Begin tissue testing 4 weeks after sprout emergence and every other week until well into flowering. Use the levels below as targets:

N: 5-6.5%	Ca: .8-2%	Zn: 20-50 ppm	Boron: 30-60ppm
P: .3-55%	Mg: .25-.5%	Mn: 50-300 ppm	Si: No suggested levels yet
K: 4-6.5%	S: .3-.5%	Cu: 5-20 ppm	Fe: 50-150 ppm

While there is no specific level of Si recommended yet, ongoing research indicates that increased Si levels reduced aphid injury and the incidence of blackleg, soft rot, and bacterial wilt. Apply SiGuard or SiMag58 with every foliar pesticide application.

Days from Planting	ISP Soluble Plant Foods Per Week Applied	Other notes, micronutrients, Ca, Mg
1 - 40	7.5 pounds 10-20-20 & 2.5 pounds 28-16-7	Apply with adequate irrigation water. Begin including nutrients once all pieces have sprouted.
41 - 80	15 pounds 10-20-20 & 8 pounds 9-14-24	Fertigate nutrients, or apply as dry prior to beds closing. Maintain even soil moisture.
81 - 130	11 pounds 9-14-24 & 15 pounds 4-18-38	Potatoes benefit from regular heavy irrigation up until vine death.

Foliar Applications: Potatoes respond well to foliar applications of potash. At the onset of tuber bulking, foliar apply 2 pounds of 4-18-38 per acre per week. This can be applied with most pesticides. If Mg is low at this time, include 8 ounces SiMag58 in this same application.

MetaCal has also shown benefits in improving skin set when applied as a foliar at 32 ounces per acre per week during the last four weeks prior to vine degradation.



Specialty potatoes are growing in popularity among the gourmet and specialty markets. In a small market, experimenting with several of these varieties could be profitable.

