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# Managing Tuber Maturity to Improve Skin Set

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Tuber maturity and skin set is often determined by simple thumb test by growers. Tuber maturity is a predominant factor influencing quality, both at harvest and throughout storage season. There are number of agronomic factors that may have an effect on the physiological age of the crop and therefore on tuber maturity at harvest. Bruising is probably the single most important factor that reduces the financial returns of the potato industry due to shrinkage and susceptibility to pathogens.

Harvesting tubers at right time favors good storability. Achieving tuber maturity is more complicated. Vine maturation is due to senescence of the plant. At this plant stage photosynthesis, carbohydrate translocation and rate of bulking decreases causing tuber maturation. Chemical maturity is a major concern for processing industry as they monitor sucrose content before and after vinekill. As tubers mature physiologically, a peak in dry matter occurs. Santerre, Cash and Chase (1986) found that increased nitrogen resulted in higher tuber dry matter at harvest, but that this affect decreased as harvest was delayed. Vine desiccation helps in promoting physiological maturity. Tuber after achieving physiological maturity sets durable skin and those tubers stores well. When tubers are physiologically mature it's time to start vine-kill and harvest. Sometimes stress due to environmental and other conditions crop may reach physiological maturity early on without proper skin set. Physical maturity is about skin set. Tubers after bulking starts skin set. Skin set generally takes about 40 days. Proper skin set provides resistance to skinning and shrinkage. Tuber shrinkage was positively correlated with percent tuber skinning in most of the cultivars. In general, over one-half of the shrinkage occurred within the first week after harvest for all harvest dates. Tuber skinning and shrinkage were markedly reduced when tubers were allowed to mature before harvest.

| | *Vine maturity* | *Physiological maturity* | *Physical maturity* |
|---|---|---|---|
| Characteristics | Leaves die | High specific gravity | Skin set |
| Benefits | Promotes tuber maturity and storability | Favors high yield and better quality | Minimizes skinning, shrinkage and disease |
| Management | Decrease availability of nutrients and water late in the season | Monitor specific gravity before harvest<br><br>Harvest when specific gravity peaks | Kill vines 2 to 3 weeks before harvest<br><br>Check skin set before harvest |

*Adapted from University of Wisconsin Cooperative Extension Bulletin A3884-02

***Vine killing***

When potatoes reach chemical maturity they stop bulking. This typically occurred prior to vine desiccation. Tubers mature, when vines senesces or dies on its own. Vine killing is a common practice for following reasons.

- Tuber maturation can be artificially induced by killing the potato vines.
- Allows to set skin thereby reduces bruising and skinning
- To control the tuber size
- Limit the spread of diseases such as late blight and other viruses
- Allows separation of vines from tubers

The three traditional methods for vine killing are mechanical, chemical, and combinations of both methods. Mechanical method of vine killing should be 14 to 21 days before harvest so that tubers able to mature and set skin. A combination of mechanical and chemical methods can increase the effectiveness of vine desiccation and, in turn, shorten the tuber maturation process.

Reports suggest that two time application of the chemical desiccant if label permits, may improve vine desiccation and tuber skin-set.

***Important considerations for harvesting and storing potatoes.***

*Rapid vine kill can cause stem-end discoloration.*

*Excess late fertilization interferes with vine and tuber maturation.*

*Too much soil moisture can increase blackspot susceptibility; too little soil moisture can hinder rapidity and degree of skin set.*

*Complete dryness of soil may lead shrinkage and susceptible to pressure bruise*

-If tubers are not mature at the time of vine kill may affect yield and specific gravity
-If there is longer interval between vine kill and harvest may affect yield and specific gravity
-Plants may continue to bulk after chemical desiccation whereas killing vines mechanically may terminate growth faster.

***Conclusion***

*Vine killing or desiccation can improve tuber maturation and skin-set which can add to the value of the crop. Potatoes with proper skin-set maintain better skin color, lose less weight in storage, and are more resistant to bruising and soft rot.*

**Sources**

Santerre CR, Cash JN and Chase RW. 1986. Influence of cultivar, harvest-date and soil nitrogen on sucrose, specific gravity and storage stability of potatoes grown in Michigan. *American Potato Journal*, **63:** 99-110.

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