

## Best Management Practices for Potatoes

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**Field Selection** – there are several important factors to consider when selecting the optimal field for growing the potato crop. Rotation history about both the frequency of potato crops, and also what other crops have been in the rotation. Remember that volunteer potatoes in adjacent crops will not have fungicides to prevent late blight spread. Soil type can provide a range of nutrient and moisture availability to the crop. Certain soil types can allow for earlier planting, require less fertilizers and need less irrigation. Avoid when possible stony soils as that increases bruising and hence reduces storage life and tuber quality. If there are low spots in the field have them tilled or consider not planting that area.

**Variety Selection** – requires that every aspect of the farm be considered, from soil type, cultural practices, to the intended market. First the grower needs to determine what are the market requirements. A round red for tablestock or a round white that chips from long-term storage in April? Then choose the variety that will work best with your farm resources and expected environmental constraints. Will the variety require additional (or unique) cultural practices? Would it be more susceptible to late blight and require more fungicide sprays, or be more drought stress prone and require more frequent irrigation? No variety contains all the desirable trait one would like, so one must choose what combinations that might work best. Be aware that there is a very large genotype (variety) by environment interaction for most traits so they might not perform the same from one year to the next.

**Seed Source and Handling** – it is important to obtain the best quality seed and handle it in an appropriate manner. Know your seed supplier well – know how they produce and handle their seed. Use certified seed – this will help minimize bringing disease problems to your farm. Store seed at appropriate and consistent temperature and relative humidity. Too warm or cycles of temperatures can age the seed prematurely – this is called physiologically aged seed – which will produce poor stands, less vigorous plants and have significantly reduced yield. Know about the tuber dormancy of the variety to help plan timing of warm-up, cutting and planting. Long tuber dormancy varieties may benefit from longer warm-up periods and possibly pre-cutting several weeks prior to planting.

**Fertility Management** – soil type, crop rotational history and variety will all impact what your fertility management practices should be. It is good to use soil tests and past crop history for the field to be used when determining what fertilizes materials and rates to use. Be careful to use appropriate application rates as too little or too much can both cause significant yield and quality problems. Excess nitrogen (N) can prolong plant maturity, make vine kill difficult, inhibit proper skin set which will make tubers more prone to soft rot, and reduce dry matter content (specific gravity). Potassium (K) levels are important for tuber quality as low K levels are associated with smaller tuber size,

hollow heart, brown center and blackspot. High levels of K can reduce after cooking darkening and reduce specific gravity.

**Disease and Pest Control** – it is always possible that a disease or pest could significantly reduce yield or even cause the complete loss of a crop. Thus it is vitally important that growers frequently scout their fields for potential problems. Utilize Cornell Cooperative Extension programming and newsletters that can provide alerts and guidelines. At this meeting Dr. Bill Fry will discuss the use of a Decision Support System (DSS) to help growers manage late blight. This web-site program helps integrate information on weather, pathogen and fungicides to help make an informed management decision. Dr. Anders Huseth will provide a talk on how to control insect pests and still maintain the effectiveness of insecticides. A principle that he discusses, reducing the development of resistance in pests to pesticides utilizing a combination of materials with different modes of action, is a good tactic to use in any control program.

**Irrigation** – is important to provide a longer and less stressful growing environment. Lost growth during the growing season can never be made up. Also note that plant nutrients can be present in adequate levels for good productivity, but if the soil is too dry the plant roots cannot absorb the nutrients in sufficient amounts and so plants will actually be deficient in nutrients. Irrigation studies in upstate New York many years ago found that while total rainfall may be at needed levels, its distribution is grouped into dry vs wet periods and not adequately spread out, hence 4 out of 5 years irrigation will provide significant improvements in yield and quality. Soil type can also help modify irrigation practices, soil types such as silty loam can hold 1.75 to 2.25 inches of water while a gravelly sandy loam will only have 0.8 to 1.3 inches available to plants.

**Overall Management Strategies** – need to take into account the factors discussed above to provide cultural practices that reduce the level of stress on the potato crop and to keep it growing in the most uniform condition possible. Crop response is additive, each cultural practice is linked and builds on the other. Note, severe stress events may not be able to be reversed with following cultural practices and may result in significant loss of yield and quality. Hence timely and accurate application of cultural practices is needed to produce a productive crop. Also, the economics of the risk to cost to profit ratios need to be considered when evaluating various practices.