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## RESPONDING TO HIGHER SEED COSTS

by  
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At the 1989 Potato Conference we discussed grower options in response to higher seed costs. As planting time again approaches, higher seed costs have prompted us to remind growers of the implications associated with adjusting seed cutting and seed spacing.

It seems that the traditional response to higher seed costs has been to reduce seed size. That response can be justified economically, but only if there is a high degree of control over seed size. Less often do we hear of growers widening spacing to offset the cost of seed. That can offer a viable alternative, too.

The following table gives an indication of the effect of changing seed size and/or spacing in response to higher seed cost. Both changes individually (smaller seed and wider spacing) reduce the effect of rising seed costs. Making both changes at once reduces the effect of higher seed costs more than either of the changes individually.

EFFECTS OF SIZE AND SPACING  
ON ESTIMATED RETURNS

<u>SPACING AND SEED PIECE SIZE</u>	<u>SEED COST</u>	
	<u>\$12</u>	<u>\$21</u>
	\$	
9" and 2 oz.	1255	1025
9" and 1½ oz.	1294	1121
12" and 2 oz.	1312	1140
12" and 1½ oz.	1328	1199

Unfortunately, the figures in the table are based on the assumption that there is perfect control over both seed piece size and spacing. That stretches the imagination quite a bit. The actual situation we know is that both seed size and spacing are quite variable. That is why we focus on the variation around the average as much as on the average itself. As average seed piece size declines, the number of undesirably small pieces that needs to be discarded increases. The cost of the discarded pieces may soon approach the savings generated by cutting smaller seed pieces.

(continued)

Similarly, as spacing is widened, the variability in spacings increases and the number of skips tends to increase. The end result is less productivity and, again, the savings in seed costs can soon be lost in lower receipts after harvest.

Given the level of technology used in seed cutting and planting, the best response to higher seed costs depends on which one the grower can best control. Whichever of the two operations a grower can do best is the one he should adjust. If spacings have the least variation (i.e., actual seed piece placement is close to the desired spacing) then adjusting spacing has the better chance of reducing the effect of higher seed costs. Conversely, if seed piece size is really close to the desired size, then that is the better adjustment.

If adjustments are made to either seed size or spacing, it will be necessary to closely check how the cutter and planter are performing. The effects of smaller seed may result in less planter accuracy and more variable spacings and lost productivity.

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#### Practices That May Reduce Seedpiece Emergence and Breakdown Problems

Use physiologically young seed.

Avoid using stressed seed potatoes.

Avoid cutting cold seed and planting immediately.

Warm seed before cutting - up to 2 weeks depending on estimated physiological age of seed.

Remove seed potatoes with decay before cutting.

Sanitize cutter regularly.

Adjust seed cutter to seed size.

Avoid practices that lead to a film of moisture on the seedpieces after cutting.

Plant well suberized seed is possible.

Avoid practices that bruise or puncture the seedpieces.

Protect cut seed from direct sun.

Irrigate dry soil 2 to 3 days before planting.

Do not plant in rain or within 4 hours of heavy rain.

DO NOT irrigate potatoes up.

These recommendations may not be effective for every grower due to differences in climatic conditions, cultivars and cultural variables.

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#### Seed Lot Reminder

The late Seed Lot planting date is April 23 so be sure to get your samples in before then. The Commercial Seed Lot Field Day is set for June 27th at the Othello Research Station.

## PRECISION PLANTING CAN MEAN BIG PROFITS \*

by  
Steve Holland, PureGro

Grower success may be defined as attention to details and precision operations. Establishing a vigorous stand of uniformly spaced plants from quality potato seed of optimum size may well be the single most important factor in achieving a top quality, high yielding crop. Any compromise or short fall in these early season requisites is almost guaranteed to reduce grower profits. Dedicated grower commitment that demands strict adherence to the highest reasonable and practical standards of performance is not without justifying rewards. These commitments must be able to resist the temptations of convenience and expedience in the "heat of the moment" out in the field.

Grower programs that conform to these kinds of guidelines are not particularly new or unique. Most of the potato producers in the Northwest that consistently rank at the top of the industry have adopted standards that require absolute degrees of precision and careful attention to even the little details.

Potato producers seeking to improve their profits may decide its time to make some changes. The big dilemma is often in deciding which activities to focus on. Results in recent seasons with growers throughout the Northwestern states indicate better seed quality, especially in the mother tuber size range, and special handling practices for single drop seed are important factors.

The reduction or elimination of the larger sizes of seed potato tubers carries with it a whole list of advantages. If one could select the optimum seed size upper limit it would be in the 8-9 ounce range. Once you exceed the ten ounce whole seed potato size, the associated problems and limitations mount rapidly. Accepting large seed potatoes makes every aspect of cutting, planting and producing a top crop a significantly greater challenge. Whole seed that is to be cut generally needs some warming at the 50-55°F temperature range in order to break dormancy. A good guide for indicating when the seed is ready to cut is that point in time when about two thirds of the eyes on the seed tubers are showing the earliest signs of sprout development. This initiation is sometimes referred to as "peeping". If your scheduling has matched the spring weather, the seed will be ready to cut and plant about the same time that field soil temperatures at seed depth (3½ to 4 inches below mean field surface level) reach the upper 40's Fahrenheit. Data has shown that wound healing and suberization processes in potato BEGIN at about 48 F. and are at their optimum in the low 50 F. temperature range. Cut seed will nearly always heal better in moist soil than in a pile. The best recommendation is to plant cut seed as soon after cutting as possible.

The smaller seed potatoes, 1½ to 3½ ounces in weight are best planted as whole tubers. They should be separated from the larger seed at the earliest opportunity and held at a temperature that will cause, on average, two to three sprouts to begin to develop at the time planting is scheduled to occur.

\* To be put in the Seed section of your Washington Potato Grower Handbook.

Soil temperature at seed depth is much less important for uncut seed. Stem number is generally well fixed at planting time so one can also maintain stem number control with uncut seed. If the single drop seed is left in the warming pile, until the larger tubers have the desired two thirds eye activity, single drop will produce excessive stem numbers and small potatoes at harvest. To leave single drop seed in the cut seed profile until cut and planted is to conscientiously limit your production potential.

One's focus should also include considerable attention to the adjustments and operation of the planter. Single drop seed may allow your planter to perform like it never has before. There are some adjustments that are necessary for this to occur. Feed gates need to be closed a bit as single drop feeds so much better you will soon have too much seed in the planter bowl. Ground speed must also be reduced due to the increased roll characteristic of round seed. Usually 0.2 MPH below the optimum for cut seed is about right. Optimum ground speeds for most planters, with the single exception of the new Lockwood, for seed spacings of 9 to 12 inches is above 2.5 MPH and below 3.0 MPH. As seed spacing decreases ground speed must also be reduced. Planters are extremely speed sensitive. Changes of only 0.1 MPH can cause LARGE changes in seed spacing precision. The optimum speed for planters is determined to a large extent by the size and shape range of the seed being planted. Ground speed gives seed a forward momentum that is maintained by inertial forces. The heavier the seed piece the more energy loss in the form of roll and tumbling action it takes to shed this forward velocity. The point is that small seed pieces come to rest much quicker than large pieces when all else is equal. But not all else is equal!

Cut potato seed comes in a variety of shapes from those rather flat to blocky to almost round. These shapes all have distinctively different roll characteristics. Add the influences of different seed weights as inertial momentum to the roll characteristic of different shapes and it is easy to see how the planter mechanisms precision seed dropping capacity is lost by the time the seed comes to rest behind the planter shoe. The only way to overcome this tendency toward randomness is to reduce the effects of each of these variables. This can be done by starting with a narrower whole seed size range which will cut into more uniform size and shape seed pieces and by reducing planter ground speed so roll plays a lesser part.

For cut seed the problems associated with seed with right angle cut surfaces (those coming from the larger tubers out of the top level of the cutter) appear to hamper planter functions at every juncture. In the hopper they are more prone to bridging over the bowl feeding mechanism. This causes inconsistent bowl levels and makes it impossible for the cup or pick device to function consistently. The roll characteristic of seed cut from the larger tubers is more erratic than any other. Whenever the count of seed from the upper level of the cutter exceeds 50% of the cut seed lot the performance of the planter quickly deteriorates and the skips and doubles frequency increases. Uneven seed spacing in the planted row becomes even more a problem.

From the production side one can make a general statement that may apply to all varieties of potatoes: "Beginning with optimally sized single drop (2 - 2½ oz) the larger the mother tuber seed potato the poorer crop expectations become." This is not to suggest 3½ to 9 ounce seed is undesirable however. It is implying that seed over 9 ounces will limit the growers yield, quality and profit significantly.

The dilemma is perhaps not how many changes to make but rather which ones can you afford not to make.

BIG POTATOES FOR SEED \*

Undesirable Aspects

More blind seed pieces

More cut surfaces per seed piece

Poor feeding (Bridging) in planter mechanism

Higher seed piece decay potential for soil pathogens

More energy needed for wound healing and suberization and less to support growth and vigor

Higher dehydration potential if planted in dry soil

Less control of stem number per hill

Delayed emergence

Reduced early vigor

Reduced yield

More harvest and handling injury

More decay infected seed pieces

More sprout numbers and stem numbers

More chance of root and plant disease from decaying seed pieces

Faster decay of planted seed would release nematodes (if present) earlier in season

More chance the tuber has nematode infection as it existed in the soil for a longer period as a seed crop

More difficult to get a cut seed size profile suitable for optimum planter performance therefore REDUCED STAND - Yield - Grade

More larger seed pieces (>3.0 oz) therefore increased cutting labor costs

More slab seed pieces

More undersize seed pieces

Carries more seed piece treatment product

Desirable Aspects

Often lower costs for seed lots with large top size limit

More likely to have been grown under balanced nutrition

Larger tubers are less likely from diseased (weak) plants

Larger tubers are less immature and fewer may sprout prematurely

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