FACTORS INFLUENCING EYE NUMBER PER SEED PIECE

by
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Summary

The number of eyes per seed piece helps determine stem number per seed piece, tuber set, and eventual yield of a potato cultivar (2, 3, 5, 6). Factors that influence eye number per seed piece are: 1) cultivar, 2) seed size, and 3) the size of the mother tuber from which a seed piece is cut. The number of eyes per seed piece assures that a plant will be produced but does not necessarily determine number of stems that may emerge.

Cultivar Differences

Russet Burbank and Nooksack cultivars were selected and the number of eyes per mother tuber were counted for five different size categories. Fig. 1 shows the average number of eyes per mother tuber in relation to mother tuber size. Russet Burbank had almost double the number of eyes as compared to Nooksack for any given tuber size and, as expected, eye number increased with increasing mother tuber size.

Visual observation of the two cultivars showed that not only does Russet Burbank have more eyes than Nooksack but the distribution of eyes on Russet Burbank is much more uniform. At the stem end of Nooksack the eyes are scarce and widely spaced while at the bud end the eyes tended to be closer together.

Effect of Seed Size

Because Russet Burbank has more eyes per mother tuber than Nooksack, it is logical that there would be more eyes per seed piece for Russet Burbank than Nooksack for any given seed size. Fig. 2 shows the effect of cut seed size on the average number of eyes per seed piece for the two cultivars.

Before selecting a cultivar to grow, the eye number and distribution should be taken into account. However, if for some reason a grower decides to grow a cultivar with a low number of eyes, then there are certain practices which would help increase the eye number per seed piece. As shown by Fig. 2, increasing the seed size is one way to increase the eye number per seed piece.

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Seed size and cultivar differences are also important for influencing the amount of blind seed pieces produced in a seed cutting operation (5). Fig. 3 shows the effect of cut seed size and cultivar on the percent of blind seed pieces produced. Nooksack, with fewer eyes, had significantly more blind seed pieces than did Russet Burbank for each cut seed size. Also, the percentage of blind seed decreased significantly with increasing cut seed size.

Effect of Mother Tuber Size

It has been reported that generally, the larger the mother tuber from which seed is cut, the less productive the resulting seed would be (2). Fig. 4 shows the effect of mother tuber size and cut seed size on the percent of blind seed pieces for Russet Burbank. As the mother tuber size increased, the percent of blind also increased. Thus, coupled with the fact that eye number per seed piece decreased with increasing mother tuber size, may explain why larger mother tubers are reported to be less productive. Fig. 4 also shows that the percentage of blind seed decreased as seed size increased. A Russet Burbank grower can keep the percent of blind seed plants to 0% if he plants at least 2 oz. seed and keeps his mother tuber size below 9 oz.

With Nooksack, using mother tubers larger than 9 oz. produced an unacceptable amount of blind seed pieces for all cut seed sizes and a staggering 40% of all 1.0 oz. seed from this mother tuber size was blind (Fig. 5). Currently, a commercial seed cutting operation for Nooksack produces around 7% blind seed pieces (4). This means that a grower planting this mix of seed is already reducing his potential stand to 93%. If a Nooksack grower were to: 1) discard all seed pieces 1.25 oz. or less, and 2) sort out all mother tubers greater than 9 oz., then he would increase his potential stand to 98% (4).

All the data shown thus far obtained was in the laboratory by cutting seed potatoes and counting their eyes, or the lack of, as the case may be. The next step was to plant the cut Nooksack seed in the field to see if laboratory data correlated to field stand counts. The correlation between laboratory and field data resulted in an r-value of 0.997 which was very high (Fig. 6). The unsprouted in the field (blind and otherwise) was around 2% greater than the lab data for each seed size category. This may have been due to skips or decayed seed pieces.

Conclusion

Eye number is important not only for determining stem number per seed piece but also for determining the percent of blind seed produced during seed cutting. Eye number per seed piece can be increased by: 1) selecting a cultivar with a high number of eyes, 2) increasing seed size, and 3) decreasing the mother tuber size from which seed is cut. These studies would indicate a minimum seed size of 2 oz. with mother tubers less than 8 oz. to assure good productive seed for maximum yields.

References

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Fig. 1. The effect of variety on the number of eyes per mother tuber. (1 year data). Avg. of 10 tubers x 6 reps. = 60 tubers per point.

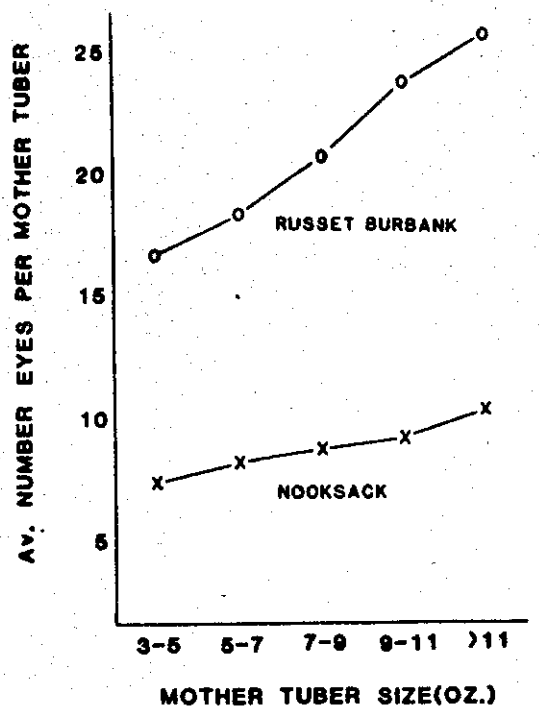

Fig. 2. The effect of variety on the number of eyes per seed piece. (1 year data). Avg. of 10 tubers x 20 reps. = 200 tubers per point.

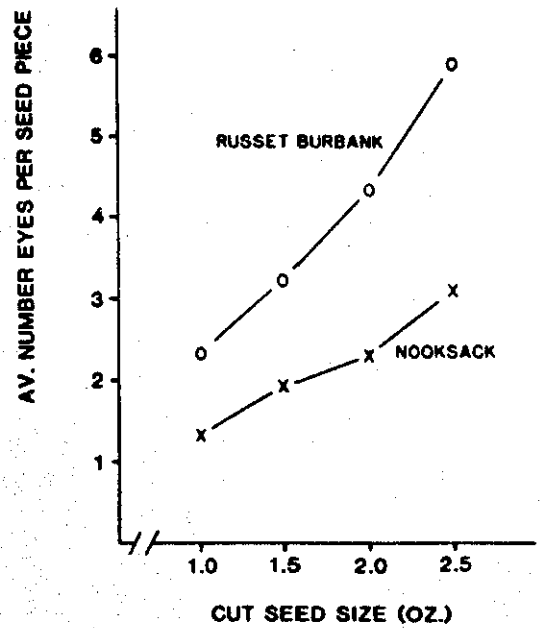

Fig. 3. The effect of variety on percent blind seed. (1 year data). Avg. of 10 tubers x 20 reps. = 200 tubers per point.

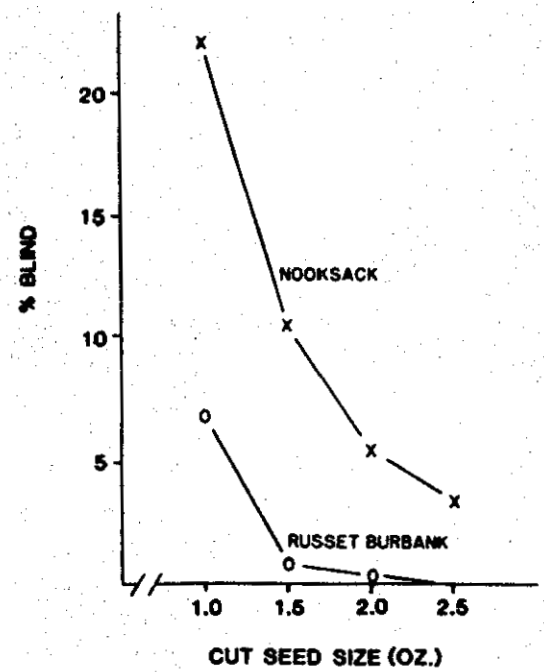

Fig. 4. The effect of mother tuber size on percent blind seed for Russet Burbank. (1 year data). Avg. of 10 tubers x 20 reps. = 200 tubers per point.

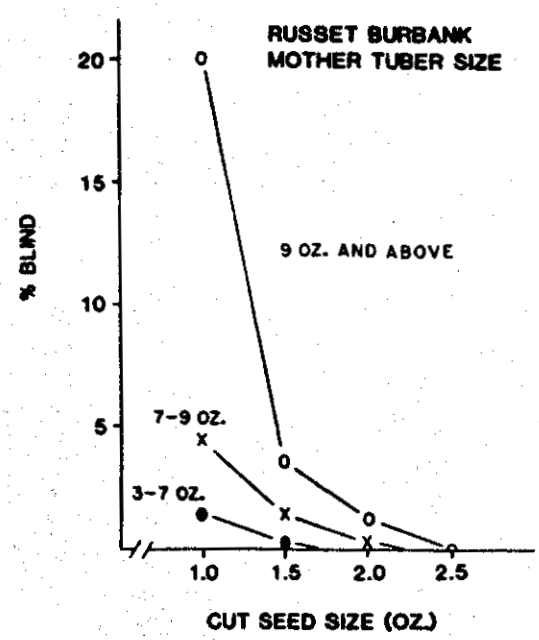

Fig. 5. The effect of mother tuber size on percent blind seed for Nooksack. (1 year data). Avg. of 10 tubers x 20 reps. = 200 tubers per point.

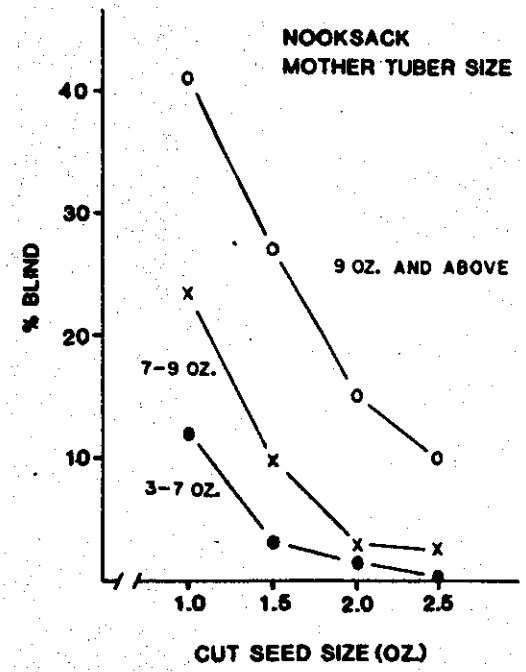

Fig. 6. Percentage of seed pieces which remained unsprouted in the field correlated with percent of blind seed planted. (1 year data). Avg. of 90 tubers per point.