IMPACT OF SEED HANDLING ON SEED PERFORMANCE

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Bruising of seed potatoes can affect the productivity and quality of the subsequent crop by providing an entrance for disease pathogens and by increasing physiological age. Bruising can occur at all phases of harvesting and handling operations and is something that a grower must be aware of from seed-bed preparation through the storage season. While the "Bruise-Free" concept has been directed at the commercial potato producer, who often receives an economic incentive for providing a high quality crop, this has not been the case for the seed producer.

This rationale led to two independent studies:

A Seed Handling Survey was conducted by Michael Thornton and James Torrell with the objective of determining the effect of bruising and dry rot infection of seedlots at the point of receipt by a commercial grower.

A Harvest Handling Survey conducted by Michael Thornton, Phillip Nolte, and myself had the objective of determing the location and extent of bruising occurring during handling at harvest in seedlots.

Seedlots in the Seed Handling Survey were evaluated for the amount of damage present. Of the eighteen lots evaluated, eleven had less than 10% of the seed tubers free of bruises, and the best lots had less than 50% bruise free tubers (Figure 1). Individual tubers were examined for number and severity of bruises. Nine lots had tubers with at least 3 bruises per tuber (Figure 2). Ten lots had two or more severe bruises per tuber (Figure 3). Finally, the same lots were evaluated for dry rot infection. Ten of the eighteen lots examined had more than 15% dry rot infection, with four of these over 40% infected (Figure 4). Thus, seedlots differ in the amount of bruise present and the amount of dry rot infection and as bruising increases, normally dry rot infection does also.

In the Harvest Handling Survey, twelve seedlots on different farms were evaluated for severity of bruise while the seedlot was on the truck and then after it had been piled in the cellar. Lots had an average of 56% bruise on the truck, which increased to 71% in the cellar (Figure 5). The bruise level ranged from 28-80% on the truck (Figure 6) and range in the cellar was from 44-84% (Figure 7).

This Presentation is part of the Proceedings of the 1994 Washington State Potato Conference & Trade Fair.

A comparison of two different farm operations shows cases where bruise did and did not increase drastically enroute from the truck to the cellar (Figure 8). Farmer B was not using let downs and had extensive drops in his piling operation. Problems noted in many operations included: conveyors not running full and often too fast, excessive drops with no let downs, missing padding and use of unpadded picking tables, no hugger belts, and piler mismanagement (not piling in a step fashion and running too high above the pile.) Thus, we can conclude that treatment and conditions affect bruising and that we need to increase grower awareness.

A third study conducted by William Bohl, Stephen Love and myself, demonstrates the impact of seed bruising on performance. Seed was bruised prior to cutting or prior to and post-cutting. While stand and vine maturity were not significantly different, stems per plant and vine size decreased with the amount of bruising (Table 1). In terms of yield effects, total yield was not significantly different, but the U.S. No. 1 yield significantly decreased as bruising increased (Table 2). This decline in performance is not due to physiological aging of the seed, but is instead related simply to the physical damage occurring to the seed.

Two key items of importance to remember during seed production and seed purchasing are 1) that seed lots differ in their growing environment, generation, storage and handling treatments and 2) that bruise prevention is a year round program encompassing pre-harvest, harvest, piling and storage operations.

References:

Bohl, W., S. Love and A. Thompson-Johns. 1992. Impact of seed bruising on potato production. Unpublished.

Thornton, M. and J. Torell. 1992. Incidence of seed tuber damage on selected seed samples. Unpublished.

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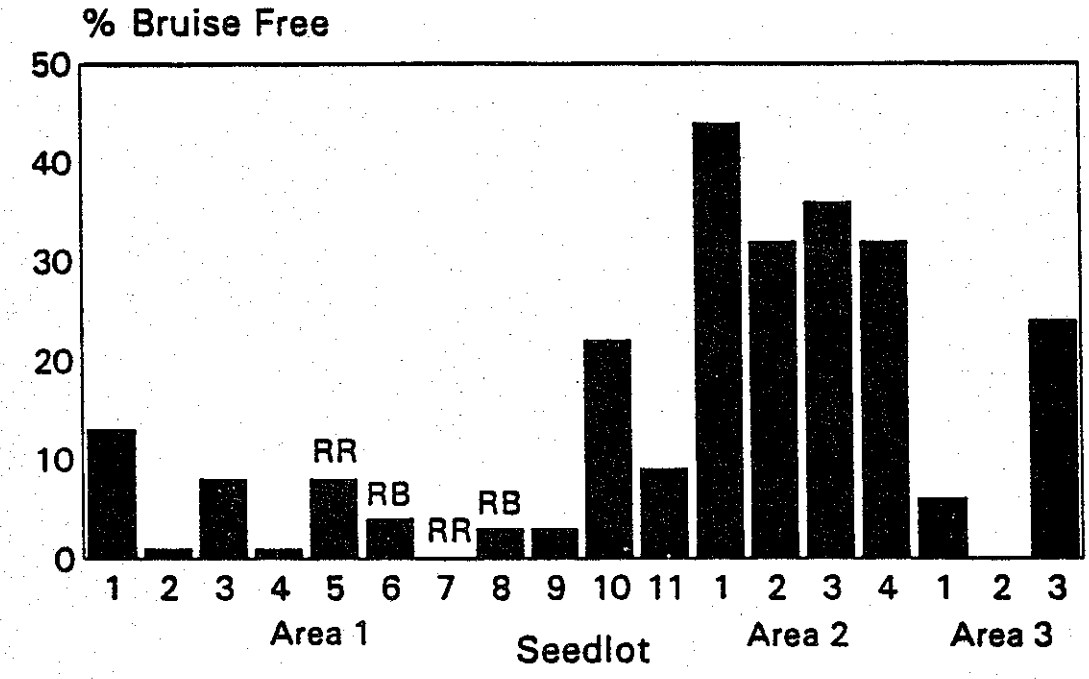
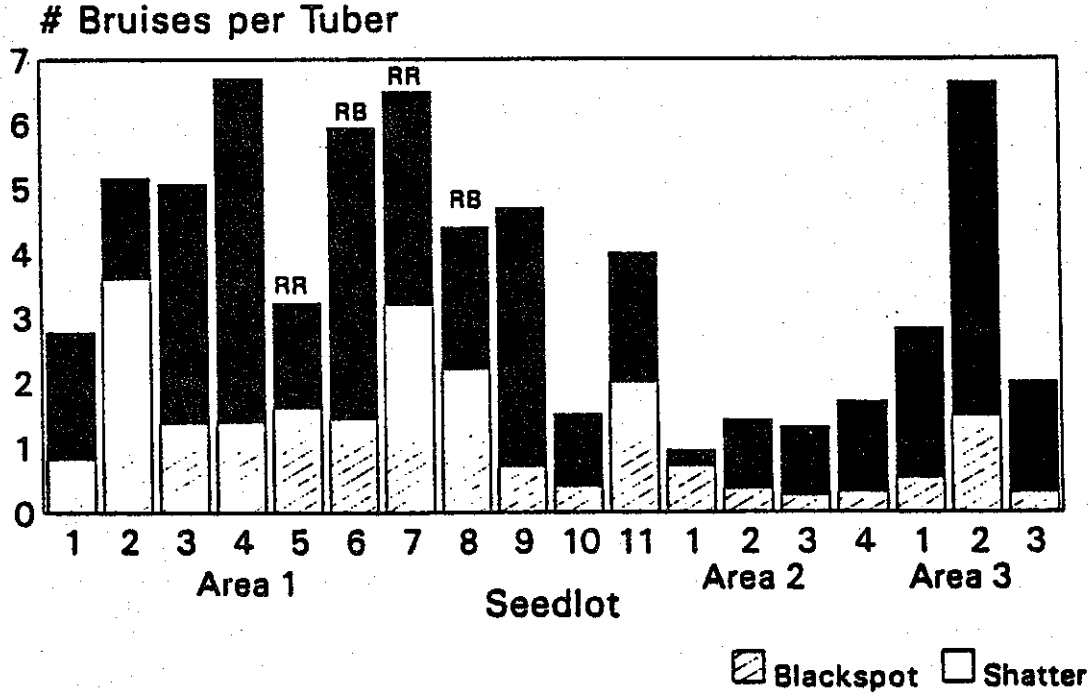
Figure 1.



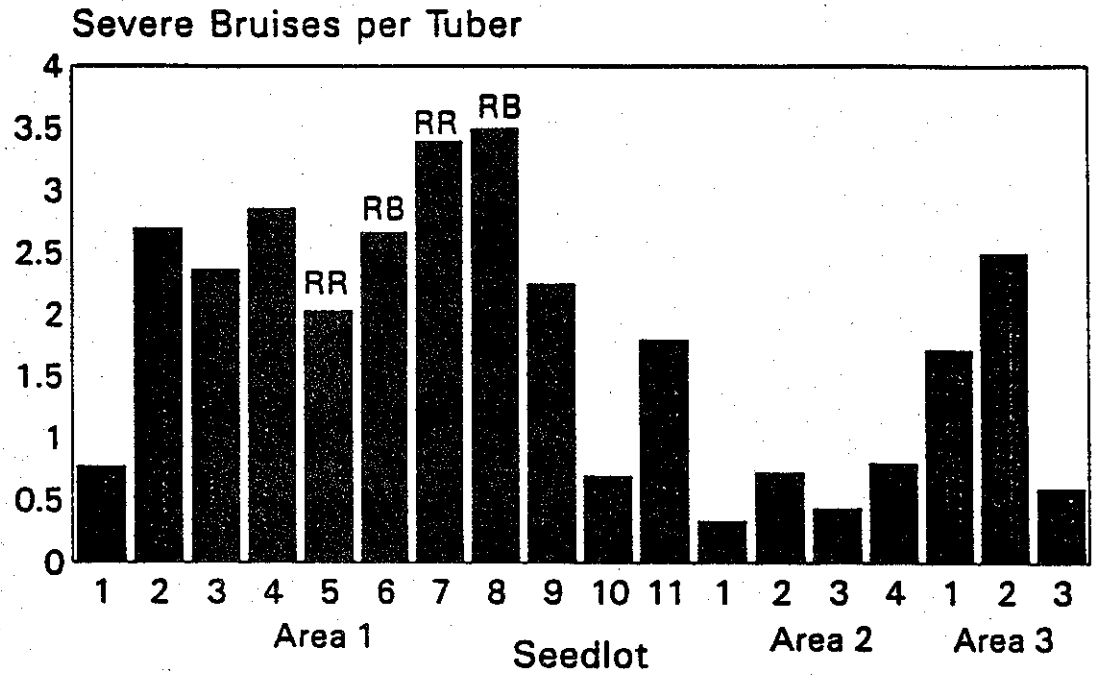
Source--M. Thornton and Torell, University of Idaho

Figure 2.



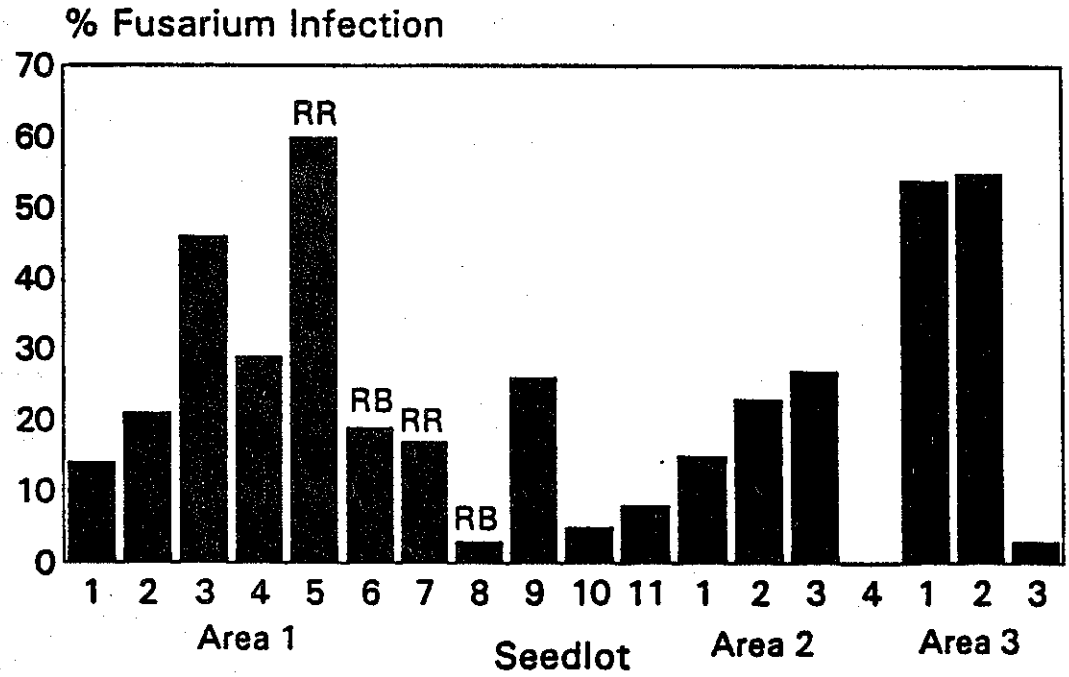
Source--M. Thornton and Torell, University of Idaho

Figure 3.



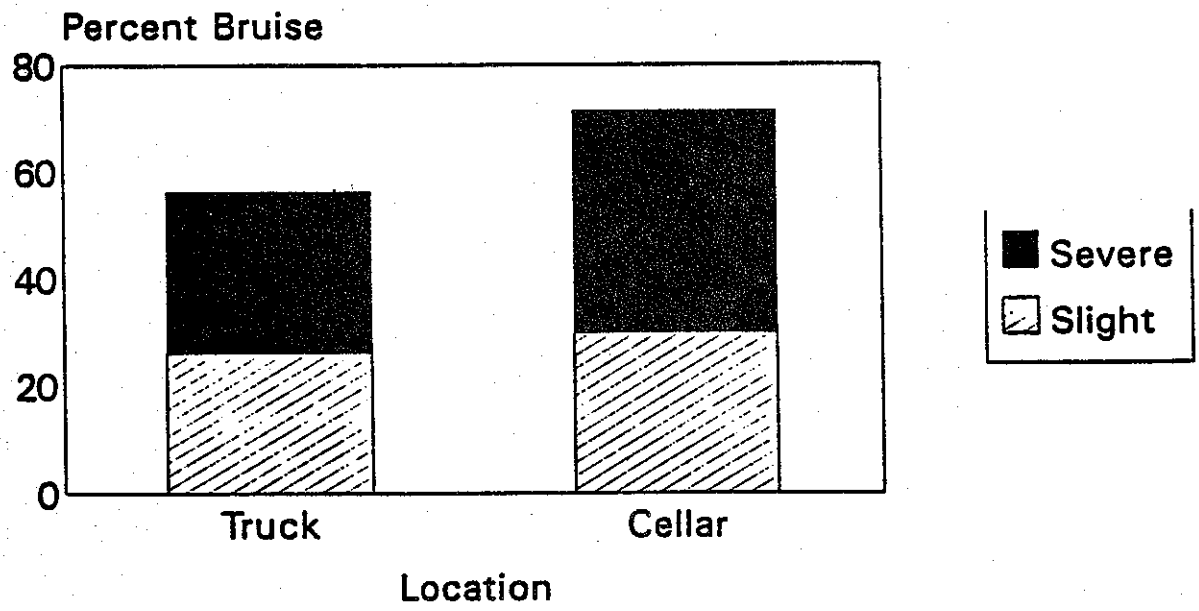
Source--M. Thornton and Torell, University of Idaho

Figure 4.



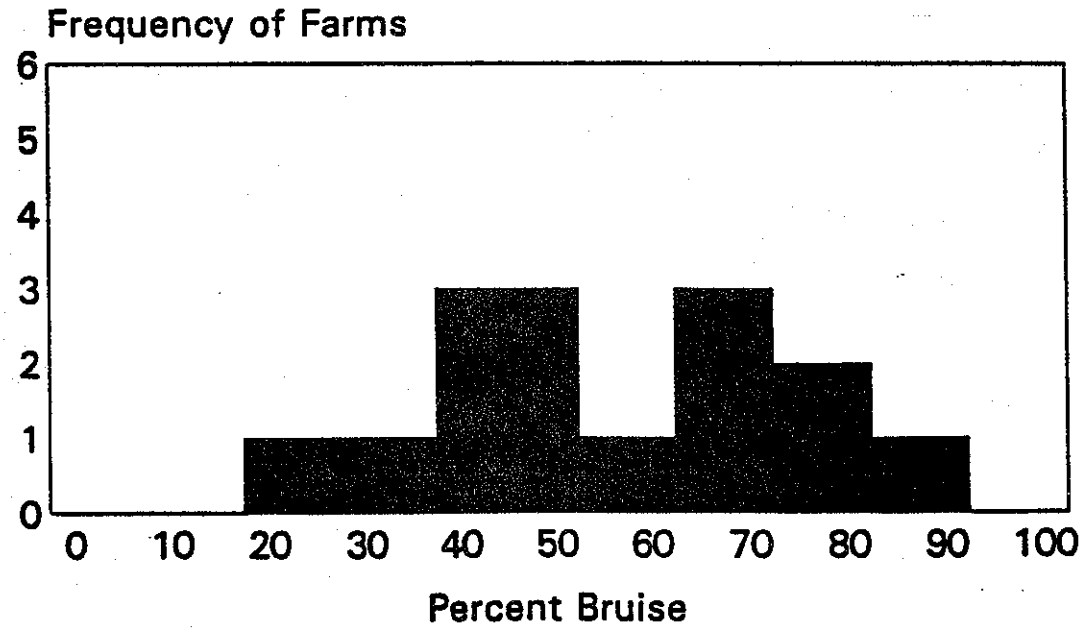
Source--M. Thornton and Torell, University of Idaho

Figure 5.



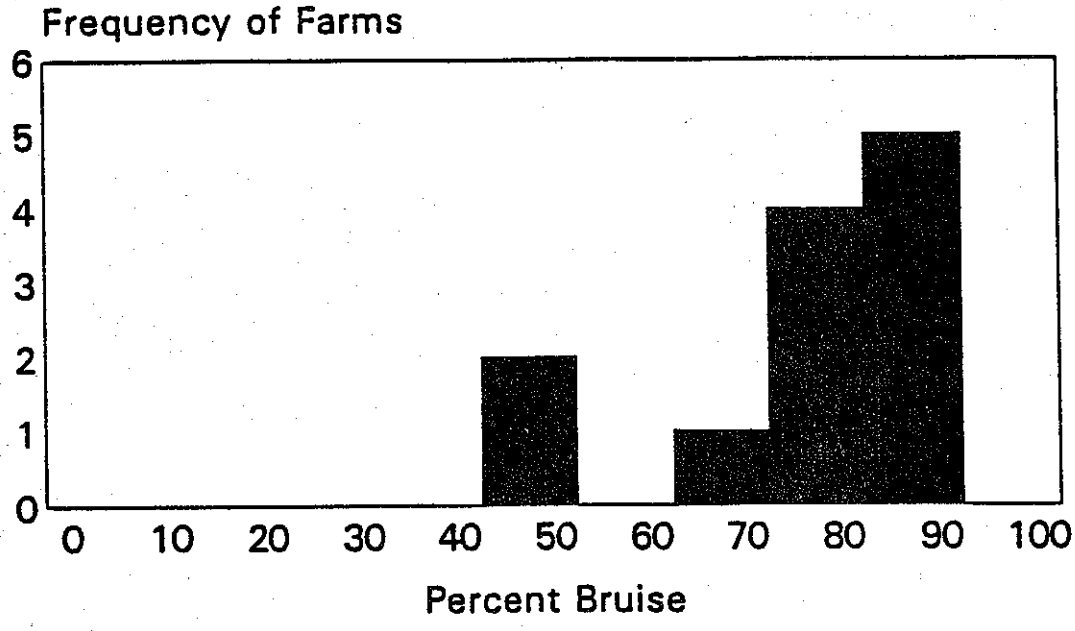
Source--Thompson-Johns, Thornton, and Nolte, University of Idaho

Figure 6.



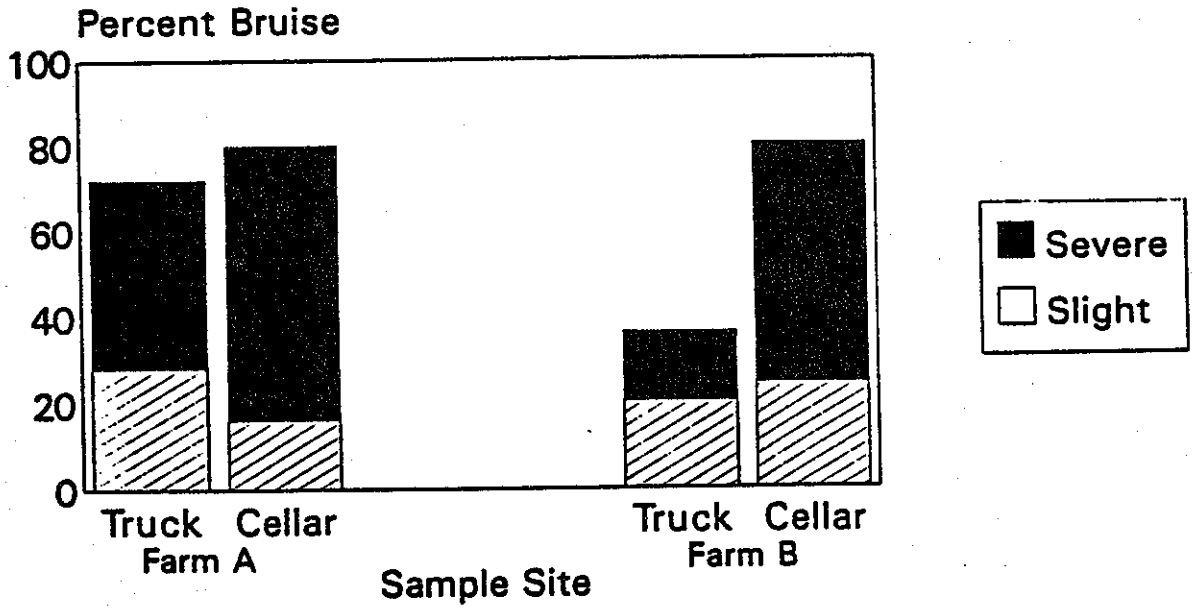
Source--Thompson-Johns, Thornton, and Nolte, University of Idaho

Figure 7.



Source--Thompson-Johns, Thornton, and Nolte, University of Idaho

Figure 8.



Source--Thompson-Johns, Thornton, and Nolte, University of Idaho

Table 1.

Treatment	Stand	Stems/ Plant	Vine Size	Vine Maturity
	-%-			
Check	94.4	3.1	2.9	2.8
Pre	92.7	2.7	2.6	2.6
Pre & Post	87.5	2.4	2.6	2.5
LSD (.05)	NS	0.3	0.3	NS

Source--W. Bohl, Love, Thompson-Johns, University of Idaho

Table 2.

Treatment	Total Yield	Yield US No. 1's	Tubers/ Plant
Check	258	221	8.0
Pre	248	208	7.3
Pre & Post	210	170	6.8
LSD (.05)	NS	41.1	0.7

Source--W. Bohl, Love, Thompson-Johns, University of Idaho