

GIANT HILL: WHAT DOES IT COST YOU?

by

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Giant Hill has been around for many years and has not been considered a major problem by the potato grower. Some of the disease problems associated with seed have been analyzed and discussed at length, but nobody has really looked at the economics of the Giant Hill problem.

For several years here in the Columbia Basin we have observed an alarming increase in the number of plants showing symptoms of Giant Hill. Some growers and others seem to feel that this is not a problem of great concern. There have been some who feel that these plants may be beneficial to the grower because of their apparent vine vigor and longevity. The 1983 crop year showed us that these plants do in fact lower our crop quality and thereby reduce our per acre return.

Giant Hill is defined in the literature as a genetic abnormality having greater vine height, stronger more vigorous stems, with smaller, coarser leaflets, thicker than on normal plants. Tubers are later sprouting and plants are later maturing. The plant usually flowers profusely and has large matted roots and numerous long, coarse stolons. They produce larger, coarser tubers than do normal plants. The Giant Hill problem is accentuated by the longer day length here in the higher latitude. Giant Hill is later maturing and is rarely mature by our normal harvest time and under some climatic conditions could result in lower yields.

Late in the season here in the Columbia Basin the Giant Hill plants remain green and vigorous while the plants surrounding are matured out and ready for harvest. The majority of fields we see have only isolated Giant Hill plants scattered across the field. Under these plants, we find a variety of interesting tubers, some with new tubers growing from the eyes of the mother tuber, some that are fully sprouted and many knobby and malformed tubers. Rare in the 1983 season did we dig a Giant Hill with normal type and quality. These potatoes greatly reduce the market value of the potatoes harvested.

The past several years we have seen too many fields that show an alarmingly high percentage of Giant Hill plants. Knowing what kind of quality resulted from these plants, we decided to make a survey to determine the actual effect Giant Hill had on the grower return. By making vine counts we determined that the fields surveyed had from 3% up to 18% Giant Hill. Admittedly, these were fields selected because they showed an abnormal amount of Giant Hill. Fortunately these figures do not represent the entire crop in the Columbia Basin, but it would be safe to say that all fields of Russet Burbank had at least a trace of Giant Hill present.

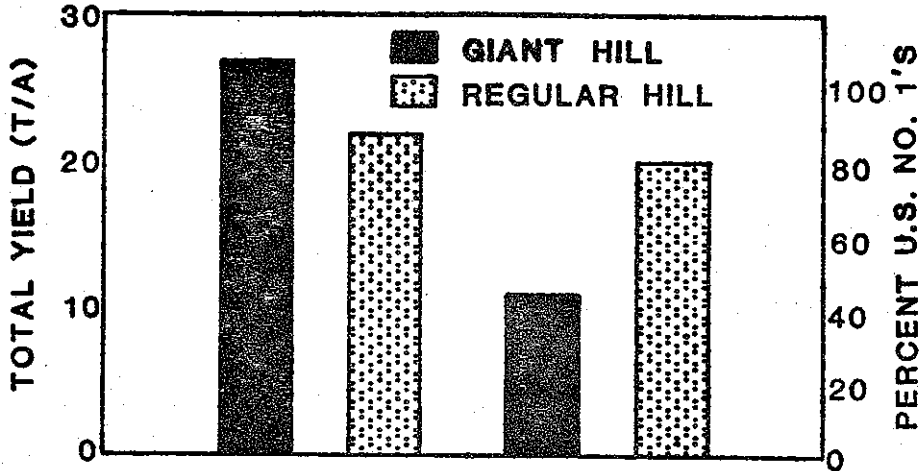
In September, just prior to harvest, we chose three different fields with varying amounts of Giant Hill present and sampled them by choosing at random ten Giant Hill plants. We then took the plant immediately adjacent to this plant for comparison. The tubers were then washed and graded using the USDA standards to determine the percent of No. 1's and No. 2's. The total tuber weights were converted to yield per acre, assuming a perfect stand on a 10" spacing and a 34" row width.

Figure 1 shows the yield and quality comparisons. The average yield for the Giant Hill was 27 tons per acre compared to only 22 tons per acre for the regular hills. This 5 ton yield advantage may not be valid because in all cases we dug the plant immediately adjacent to

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the Giant Hill plant. Some of these plants were obviously affected by other problems and were most likely lesser yielding because of the competition with the more vigorous Giant Hill plant.

Figure 1.



The quality comparison in Figure 1 gives a clear picture of the type potatoes harvested. The Giant Hill produced only 44% No. 1's compared to 81% No. 1's on the regular hills. A crop with the quality and appearance of the Giant Hill potatoes would not be useable as a fresh pack and the misshapen tubers would not be efficient to use for processing.

Figure 2.

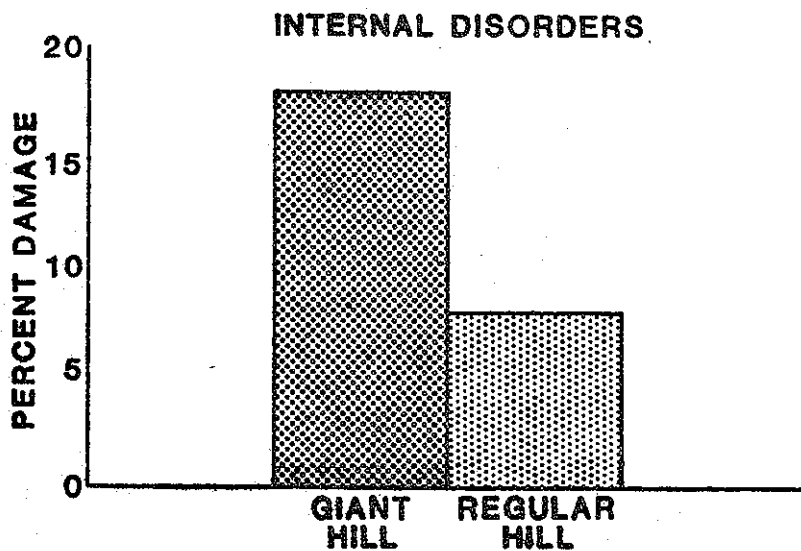


Figure 2 demonstrates the difference in the internal quality of the potatoes. All of the internal damage scored was either Hollow Heart or Brown Center, the Giant Hill having 18% damage compared to 8% damage in the regular tubers. This difference of 10% would be a very significant factor in the grower dollar return. Some contracts in the Columbia Basin treat all internal damaged potatoes as cull material, thereby reducing the useables or pay weight to bring a lower dollar return to the grower.

Using the assumption that we had a field consisting of 100% Giant Hill and another field with 0% Giant Hill, we applied the above figures to a grower contract used in the Columbia Basin in 1983. These figures show us that the Giant Hill quality would only return \$50.00 per ton compared to a value of \$80.00 for the regular hills. Using the yield and dollar figures we show the following:

Figure 3.

GIANT HILL RETURN-

***\$50.00/TON x 27.0T-**

***\$1,360.00/ACRE**

REGULAR HILL RETURN-

***\$80.00/TONx22.0T-**

***\$1,750.00/ACRE**

Figure 3 shows that the grower return for the Giant Hill would be approximately \$400.00 less per acre. These figures clearly demonstrate the loss the grower incurs due to the presence of Giant Hill. This can be interpreted to show that for each 1% of Giant Hill present in the grower's field, his dollar return would be reduced by \$4.00 per acre. If we have fields such as the ones we selected and counted, the 3% Giant Hill would reduce the return to the grower by \$12.00 per acre. 10% would reduce the return by \$40.00 per acre, and if you had the 18% field, your return would be \$72.00 per acre less than a field with no Giant Hill.

We are seeing far too many fields like this one. We know that the problem stems from a genetic malfunction and perhaps cannot be entirely eliminated. We also know that the source of the problem is in the seed planted. The seed grower needs to make a concerted effort to rogue and remove as many of these plants as possible late in the season. The commercial grower needs to evaluate his seed on the basis of Giant Hill as well as the other quality factor. The seed grower who is removing and cleaning up the Giant Hill is probably also doing a better job on his entire seed operation.