



# Potato Progress

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## Toxic Seed Piece Syndrome or a.k.a. IWW (I Wonder What!)

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### What is Toxic Seed Piece Syndrome or I Wonder What (IWW)?

Toxic seed piece syndrome (TSPS) has been identified in many fields in the Columbia Basin this season. This problem has been seen periodically over the last 15 years. Extensive testing in the past, to look for plant pathogenic fungi, bacteria, and viruses, failed to identify a particular agent responsible. Over the years this problem also has been called IWW (or I Wonder What) due to the failure to find its cause.

### Symptoms

This poorly understood disorder allegedly results when breakdown products from the seed piece are transported up the vascular tissue to the leaves. The seed piece does not rot in a typical fashion. Initially the seed piece is firm, though areas of the tuber can have a watery rot. Upon cutting, the internal "color" has a more translucent, gelatinous appearance (Photo 1). With time the seed piece breaks down, but remnants of the translucent seed piece may still be found attached (Photo 2). Rarely are above ground symptoms seen when the seed tuber is hard and has the normal white internal appearance. Generally there is no "rotten" smell associated with these deteriorating seed pieces.

Above ground symptoms can be remarkable and easily distinguished from most other problems. An early symptom is interveinal bronzing of the leaves (Photos 3 & 4). This is followed by wilting of stems. Not all stems arising from a seed piece may be affected (Photo 5). The wilted stems tend to remain erect rather than flopping over when they die. The progression of symptoms is very rapid and can be mistaken for any number of wilt diseases. The vascular tissue is usually discolored brown near the attachment to the seed piece, though this discolored region can extend high in the stem (Photo 6). Plants usually do not survive.

### What Else is Known

Not all seed lots are the same. In fields where more than one seed lot has been planted, the amount of damage in each seed lot is often different. More symptomatic plants are seen in stress areas, such as ridge tops, in contrast to lower areas. Lastly, even though rates of symptomatic plants have been reported as high in some fields, the actual percentage of plants impacted is low, generally around 1%. There has not been any indication that state of origin of the potato seed has any relationship to the level of damage.

This problem is difficult to gather additional information about due to the sporadic nature of its appearance. However, a team of researchers in the PNW is trying to piece together the environmental factors and other conditions that may lead to TSPS. If you have seen these symptoms in any potato fields this year, or in the past, would you please fill out the accompanying questionnaire and return to any of the following:

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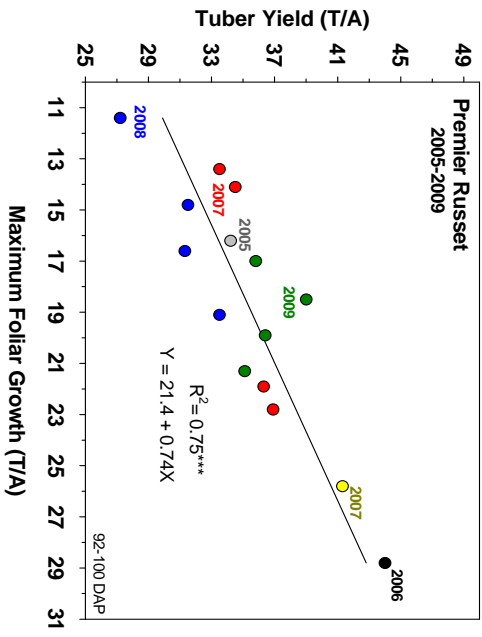
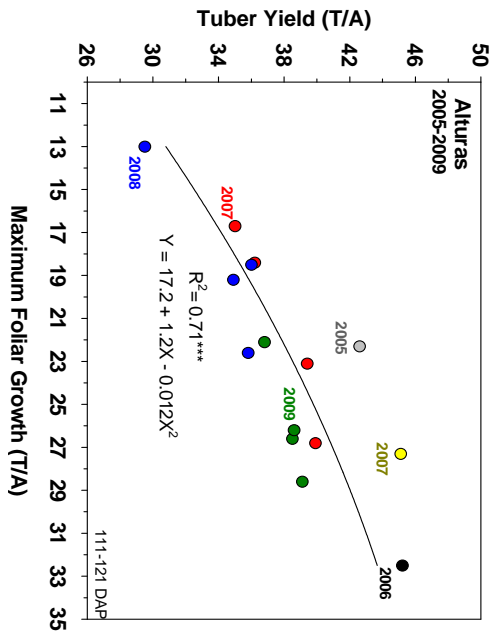
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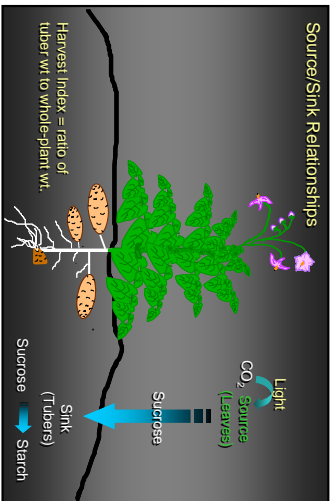




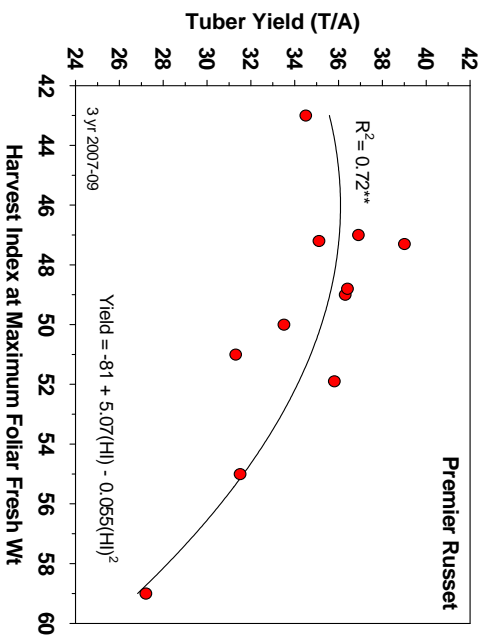
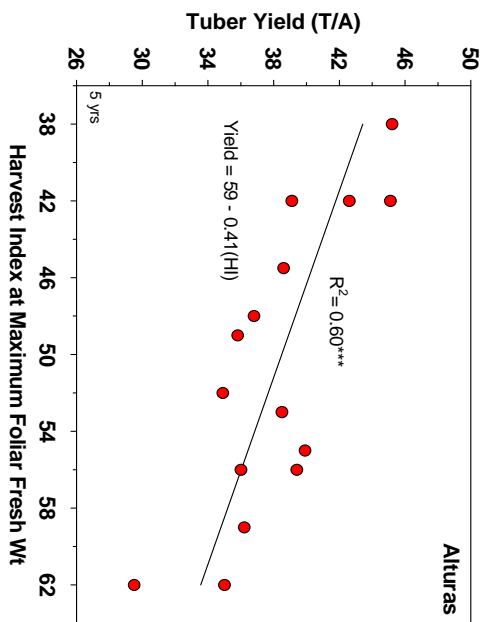




**Dependency of tuber yield on foliar growth in Alturas (top) and Premier Russet (bottom).** The yield (T/A) of above ground foliage at maximum foliar growth was estimated from regressions of foliar fresh weight vs. days after planting. Data from 5 years of trials (color coded) are shown (\*\*\*P<0.001).



$$HI = \frac{\text{Tuber Yld}}{\text{Foliar} + \text{Tuber Yld}}$$



Tuber yield declines with increasing harvest index (HI) in Alturas (top) and Premier Russet (bottom). HI was calculated at the point of maximum foliar growth (~109-128 DAP). HI is tuber fresh weight as % of total plant (tubers + tops) fresh weight. Maximum yields were obtained when tubers accounted for 38 to 47% of total plant fresh weight at maximum foliar growth. A source/sink imbalance occurs if tuber growth dominates plant growth (e.g. HI = 58-62%) at maximum foliar development, resulting in lower yield.