have struggled with the challenge of improving the rate of adoption of their new releases.

The Agriculture and Agri-Food Canada potato breeding program at the Potato Research Centre, Fredericton, established a new release procedure in 1998 designed to improve the effectiveness of the cultivar introduction. The two stage "accelerated release" procedure involves companies at an early stage of selection evaluation, provides the opportunity for them to obtain a return on their investment, and is equitable and open. In stage one, companies are offered new selections for two years of non-exclusive field and post-harvest testing. Companies interested in further testing are invited to submit cash bids with the highest bidder advancing to stage two and the opportunity to continue testing a selection on an exclusive basis for a further three years. At the end of the three years, or sooner at the request of the company, stage two also allows the company the right to negotiate with AAFC a six-year renewable license to commercialize the selection. Since 1998 69 French fry, chip and fresh market selections have been offered to industry. Industry involvement in the evaluation of these selections and the number of commercialization licenses completed will be reported.

Response of potatoes to soil-applied insecticides, fungicides and herbicides. Thornton, Michael K, D Atkinson, PJS Hutchinson and JS Miller. University of Idaho, Parma R&E Center, 29603 U of I Lane, Parma, ID 83660; Aberdeen R&E Center, P.O. Box 870, Aberdeen, ID 83210.

Many new pesticides have been registered for use in potatoes over the past several years. These newer pesticides are generally used at relatively low rates and rely on systemic activity to move throughout the plant. Despite the fact that interactions among systemic pesticides are well documented in crops such as soybeans and corn, little effort has been made to evaluate these interactions in potatoes. A field trial was conducted at the Parma Research and Extension Center during 2004 to evaluate the potential for interaction among several classes of pesticides commonly used in potatoes. Cut seed of cultivar Shepody was planted in replicated plots with in-furrow treatment as the main plot. The main plots included three insecticide treatments (aldicarb, oxamyl, non-treated) in a factorial combination with three fungicide treatments (azoxystrobin, flutolanil, non-treated). Sulfentrazone herbicide was applied just prior to planting as a split plot to evaluate the potential for the in-furrow treatments to increase plant injury. The combination of oxamyl with either fungicide significantly increased seed decay compared to the non-treated control. Aldicarb and aldicarb with flutolanil also increased seed decay. In-furrow fungicides reduced the incidence of rhizoctonia stem canker, while the insecticides tended to increase rhizoctonia. The combination of aldicarb with either fungicide significantly reduced marketable yield and tuber size. Sulfentrazone caused visible plant injury and also reduced marketable yield. However, there was not a significant interaction between the in-furrow and herbicide treatments.

Root zone calcium can modulate GA induced tuberization signal. Vega, Sandra E[1], Jiwan P Palta[1] and John B Bamberg[2]. [1]University of Wisconsin-Madison, Dept. of Horticulture, 1575 Linden Drive, Madison, WI 53706; [2]USDA/ARS, Vegetable Crops Research Unit, US Potato Genebank, 4312 Hwy 42, Sturgeon Bay, WI 54235.

High GA level inhibits tuberization, and tuberization is promoted by reducing GA level. Calcium is known to be a second messenger regulating many developmental processes in plants. Signals such as light, hormones, gravity, touch, wind, cold, drought, oxidative stress and fungal elicitors have been linked to perturbation of cytoplasmic Ca^{2+} concentration. Several studies have implicated that GA is transduced by an increase in Ca^{2+} concentration and calmodulin levels. Using in vitro propagated potato plantlets and continuously maintaining root zone calcium, we have recently demonstrated that tuber number and tuber size are controlled by root zone calcium. It appears that a strong tuberization signal can be induced by lowering calcium around the developing stolon. The present study was conducted to investigate the possible relationship between root zone calcium and GA concentration in tuberization signal. For this purpose, we developed a system utilizing pure silica sand that allows precise control of root zone chemical composition and monitoring of tuberization. Root zone calcium concentration was controlled by continuously supplying a known solution as a drip. We were able to override the inhibition of tuberization by GA, by lowering extracellular calcium. As stated above, high GA inhibits tuberization. By lowering calcium we were able to overcome the inhibitory effect of GA on tuberization. Our preliminary studies provide first evidence for the modulation of GA control of tuberization by extracellular calcium. These studies have a strong possibility of opening new avenues for understanding the role of GA in the tuberization process.