



# Innovative treatments appeal to consumer tastes for table potatoes

When buying red potatoes for the table, consumers look for a uniform, dark skin colour.

However, growers' most popular red potato is the Norland variety, the colour of which is highly variable and tends to fade during storage. A recent study by the University of Saskatchewan's Department of Plant Sciences and supported by the Saskatchewan Ministry of Agriculture's Development Fund looked for ways to enhance the colour of red-skinned potatoes like Norland to make them as popular with consumers as they are with producers.

Good genetics is the most important factor in ensuring a consistent, long-lasting dark red colour. A new variety (Peregrine Red) was released in 2002, which has a more consistent and longer-lasting colour than the Norland, but is slightly smaller, later-maturing and susceptible to common scab. For now, the Norland potato remains the industry standard.

Researchers have developed an agronomic approach to produce a good red colour in potatoes by applying a plant growth regulator (PGR)—such as a non-lethal dose of 2,4-D or the naturally occurring hormone abscisic acid (ABA)—to the foliage at the onset of flowering. A research team led by Dr. Doug Waterer looked at the effectiveness of these two treatments in enhancing skin colour.

While 2,4-D is not registered for use on potatoes as an herbicide, it has been registered in the United States since the 1950s for use in enhancing skin colour in potatoes. In May of this year, Canada's PMRA approved a similar registration for colour enhancement on red potatoes.

Dr. Waterer's new research supported the findings of previous studies, which showed that an application of 2.5 fluid ounces per acre of the low-volatility ester formulation of 2,4-D at the stage when the flower buds are just beginning to form—and another application two weeks

later—enhanced skin colour, both at the time of harvest and after extended storage. While the 2,4-D altered the appearance of the foliage, it had no consistent impact on yields. It did, however, slightly reduce the average size of the tubers. The 2,4-D also reduced the level of common scab infection, but occasionally increased the level of powdery scab.

The other option is the naturally occurring ABA. Plant growers have known for years that exposure to cold will enhance the colour of red-pigmented crops by triggering the production of ABA. It was California grape growers who found that applying ABA mimicked the effect of exposure to cold. The National Research Council (Saskatoon) has developed a range of synthetic ABA analogs which have been shown to be more powerful and longer-lasting than natural ABA.

However, neither the natural nor the synthetic versions of ABA were found to have a consistent impact of the colour of red potatoes even though both had produced obvious, long-lasting changes in other test crops. The ABA treatments were also ineffective in providing scab control.

Dr. Waterer's research project and the recent approval of using 2,4-D for potato skin colour enhancement will give potato growers an opportunity to appeal to the market preferences for red potatoes.

The Agriculture Development Fund provides funding to institutions, companies and industry organizations to help them carry out research, development and value-added activities in the agriculture and agri-food sector. The results produce new knowledge, information and choices in technologies, techniques and varieties for farmers, ranchers, processors and input suppliers, to improve the competitiveness of Saskatchewan's agriculture sector.

In 2012, the Saskatchewan Ministry of Agriculture committed nearly \$11.8 million in new funding for 60 ADF research projects.



Three of the treatments are represented in this picture. The potatoes treated with 2,4-D are labeled T1, those treated with ABA are labeled T2 and untreated potatoes are T3.

Potatoes in T1 are clearly a darker red than the other potatoes. While the difference between treatments in the picture is relatively subtle, the difference is readily apparent in person. The colour enhancement from the 2,4-D is effective after extended storage as well.

