BADGER BEAT

Seeds of Change

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Potato Growers are accustomed to change. Adopting improved methods, acquiring new equipment, acting on opportunities and adapting to changes in the marketplace are part of running a successful business.

Change is easy to see when looking backwards, even if it occurred gradually. Consider how the incremental incorporation of computers and information technology into nearly every business has changed how potato growers manage their crops and interact with customers and suppliers.

Anticipating change is much more difficult than recognizing it after the fact. Will the latest buzz lead to a long-term trend or will it be a fad? Will potential market opportunities lead to increased sales? Will the latest trendy research topic lead to improvements in commercial practice?

No one knows, but these are questions that many of us are thinking about as we consider how diploid, hybrid potatoes may impact the global potato industry.

Companies and public breeding programs working on diploid, hybrid potatoes envision new varieties coming to market that have improvements to agronomic performance or consumer acceptance that will encourage adoption by industry.

For that to happen, however, a lot of pieces must be put in place. For example, what will be done with true potato seeds? How do they slot into the production system?

Several possibilities are being discussed. Some have proposed that true potato seed will be used to produce seedlings that will be transplanted to production fields.

This is the approach used to plant 230,000 acres of processing tomatoes every year in California. Tomato seedlings are grown in commercial greenhouses and planted by growers using mechanical transplanters.

Our research group decided to see how well mechanical transplanting of potatoes works in the sandy soil found in Central Wisconsin. As a first step, we needed to find a suitable transplanter.

What you need to know about diploid, hybrid potatoes

Diploid, hybrid potatoes are varieties that are propagated in the first generation from true seed instead of tuber seed. They are hybrids because they are the offspring of two complimentary parents. They are diploid because they have two copies of each chromosome rather than the four copies found in our current potato varieties. Potato breeding is more effective when working with two rather than four sets of chromosomes.

OLD FINGER PLANTER

Paul Sytsma at the Hancock Agricultural Research Station (HARS) discovered a finger planter in the shed, but it hadn't been used in a long time. My first impression—not a high-priced item at a barn sale.

However, with input from Andy Hamernik, the crew at HARS did a great job refurbishing the unit.

Andy and Paul conducted test runs to determine appropriate seedling size and soil plug size.

Then, on a sunny morning at the end of May, we planted our first rows. We

The finger transplanter is shown before (A) and after (B) refurbishment. Mechanically transplanted seedlings are pictured on the day of transplanting (C) and one month later (D).

also transplanted seedlings into the adjacent rows by hand.

The plants grew well with both transplant methods.

Bottom line, mechanical transplanting of potato seedlings works just fine.

There are caveats related to mechanical transplanting that are worth noting, even at this early stage.

First, seedling production in the greenhouse needs to target a specific planting date, since seedlings that are too small or too large are likely to produce suboptimal results.

Second, the time required to plant an acre may be a concern. We moved down the row at a leisurely pace to give the operators enough time to load seedlings into the fingers of the transplanter.

Clearly there is a need to critically evaluate tradeoffs between acreage planted, planting date window and speed of transplanting.

Finally, the labor needed for mechanical transplanting is a significant consideration. We had one equipment operator and two people riding the planter. Multi-row planters reduce the number of people involved per row planted, and automated transplanters exist.

Very quickly the questions we need to address shift from "How well will it work?" to "What can we afford to do?"

OPERATIONAL CHALLENGES

We concluded that there are few technical limitations to mechanical transplanting, but many operational challenges.

What about direct seeding with true potato seeds? This approach is seen by some as a long-term goal for diploid, hybrid potatoes.

With the generous assistance of Jeff Hanson (Hanson & Associates), we explored options for directly sowing potato seeds at the Hancock Agricultural Research Station.

For this preliminary trial, some seeds were planted by hand at various spacings, others were planted along with rye to function as an early season windbreak, more were pelleted and still others were mechanically planted with a vacuum seeder using a custom seed plate that Jeff fabricated.

Much to my surprise, the seedlings in several of the trial plots survived the hot weather we had early in the season and became established.

Not surprisingly, growth of plants sown from true seed is well behind

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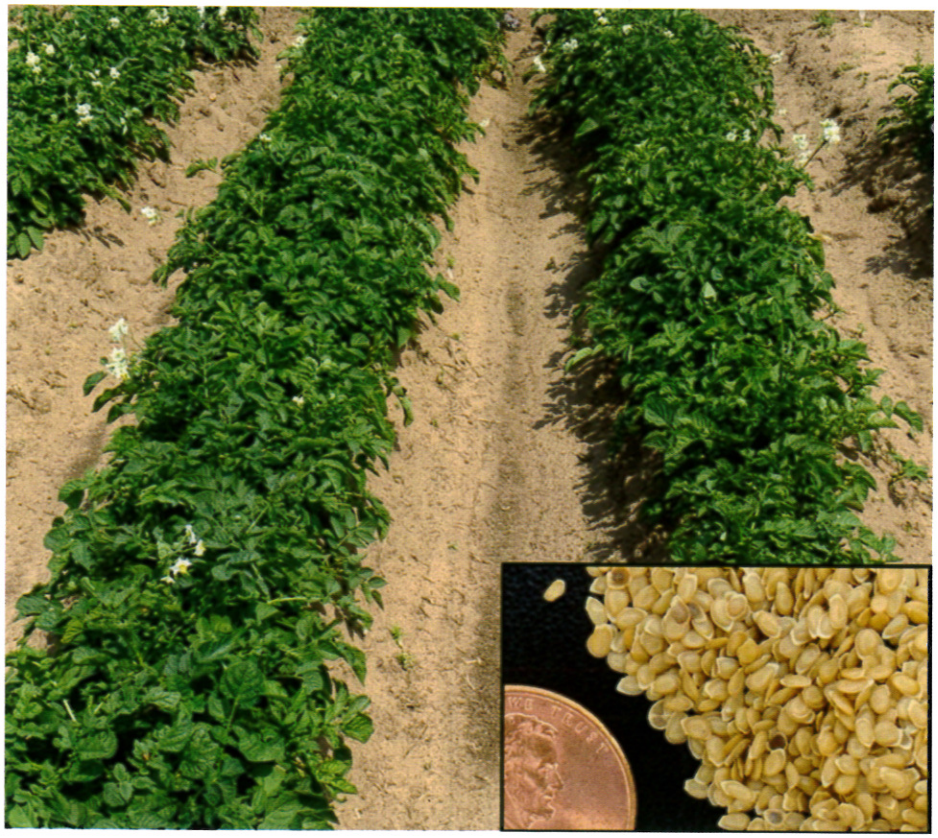
that of plants transplanted as seedlings, and even further behind what we would expect for hills grown from tuber seed.

It is worth noting that young potato seedlings are small and initial growth is less vigorous than that of many weeds. Our direct seeding trials were weeded by hand until the plants were large enough to tolerate an herbicide application.

Hand weeding seems impractical for large commercial applications and alternative methods of weed control would need to be implemented.

We will let these plants grow as long as temperatures remain above freezing. Then we'll see how many tubers they produced and how many tubers are present. BCT



RIght: True potato seed (insert) is shown with directly seeded potato plants.