Putting outcomes of pest and disease research into practice: A potato consultants view

Stuart Wale

Potato Dynamics Ltd

POTATO DYNAMICS LTD

Overview

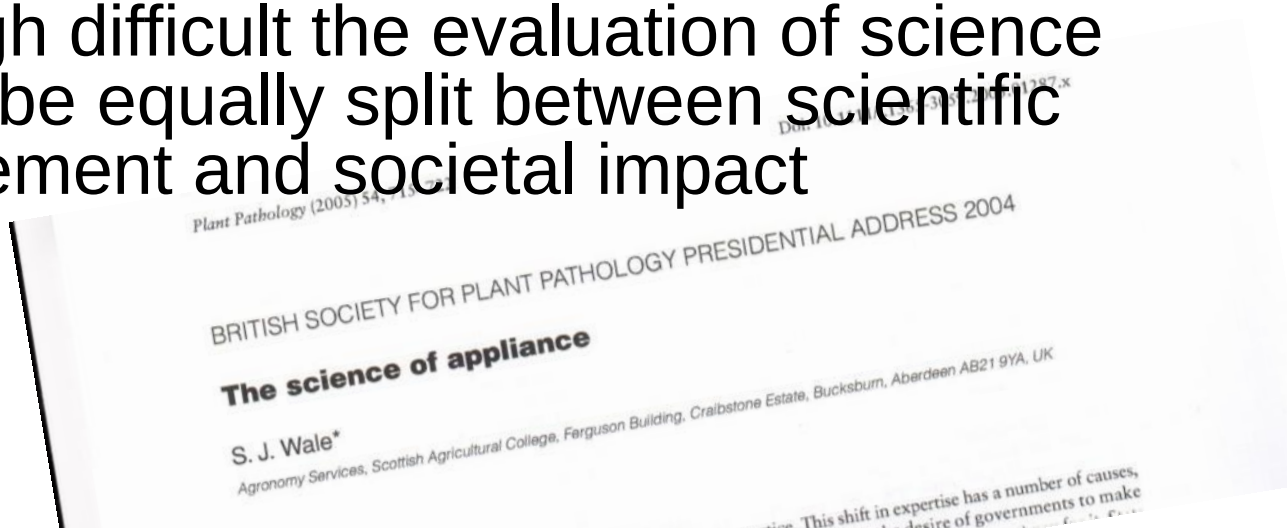
- The serious bit
  - Getting research into practice: the goal of research?
  - A criticism of some funders
  - Releasing information too early
- The difficult bit
  - Conveying the outcomes of research to the farmer/grower

What is the goal of research?

- To make a difference?
- To see your discoveries put into practice?
- Is publishing a refereed paper a sufficient goal in itself?
- Too much research never finds its way to the end user ☹
- Too much research is carried out in isolation from the end user ☹

A criticism of (some) research funders

- Research funding is often short-term perhaps 3 or sometimes 5 years
- There should be provisional funding to carry potentially valuable research through to the end user beyond the end of the project
- Researchers are judged on their publications and to a much lesser extend on impact on society.
- Although difficult the evaluation of science should be equally split between scientific achievement and societal impact



Releasing information on research too early can be disadvantageous

- Some funders require research outcomes to be presented before the project is complete
- Some end users appreciate this
- But health warnings and caveats about early adoption should be strongly expressed

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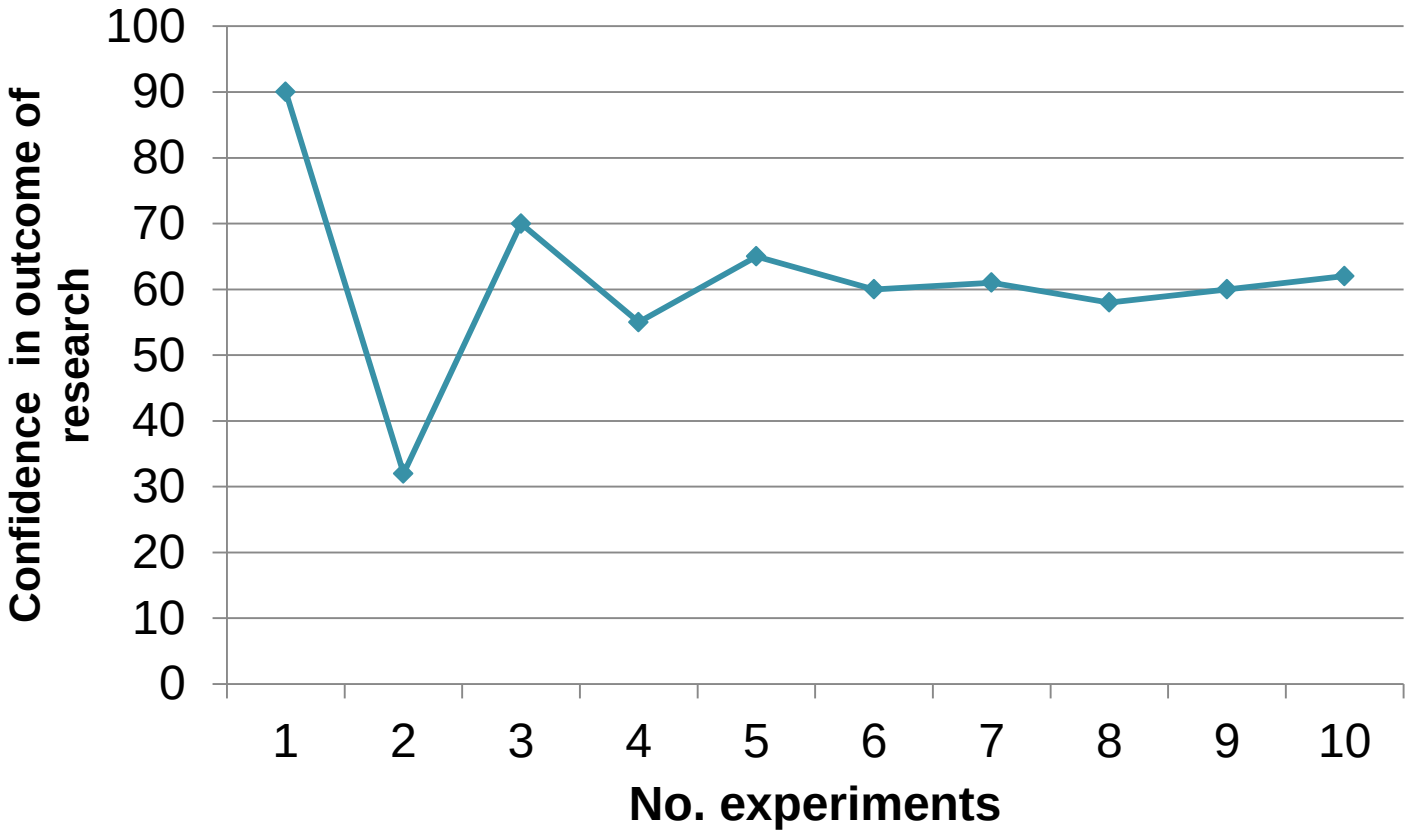
Expectations of a positive result from uptake of research outcomes



Getting the message across to farmers and growers

- Farmers and growers are a mixed bunch
  - Some don’t want the detail just the message
  - Some want every last detail before they are convinced
  - Some wait until another grower has tried it
  - Some will only listen if a change in practice leads to more profit
  - Some remain eternally sceptical
- A key feature of delivering research into practice messages is understanding the psychology of the farmer/grower and their attitude to risk

Simplifying outcomes of research

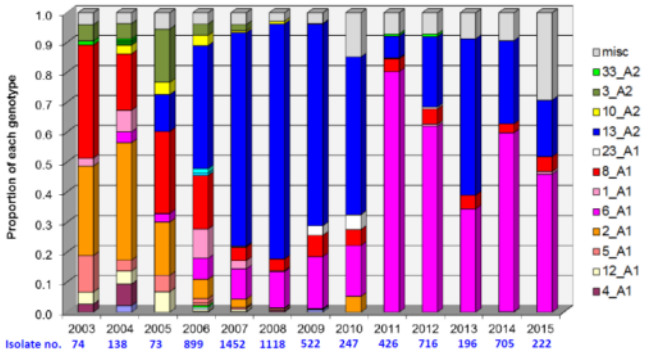
- Outcomes of research can be complicated
- As a scientist, you may want to insert lots of caveats around an outcome of research
- But farmers and growers generally just want the one-liner
- If asked, could you summarise your research outcome in a sentence?
- Putting the message across is best achieved where the messenger has some credibility and understands the farmer/growers situation
- Get out and meet end users!

Understanding the growers situation

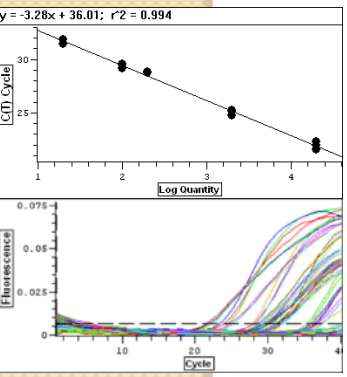
- This is critical. The research outcome may be great on paper but it has to fit in with the production system of a grower
- For example, if a new technique means that planting is slower, a grower with 80-90 ha of potatoes to plant in a short window just wont be interested
- The farmer/grower must see a clear benefit in implementation of a research outcome is not sensible if it creates other problems in doing so

The impact of new blight strains

- Traditionally growers sprayed for late blight on 10-14 day intervals
  - “I never start my programme until after the Highland Show in late June”
- The discovery of new pathotypes with increased virulence has resulted in 7 days intervals becoming standard
  - “My blight spray programme is too expensive, I’m always on the sprayer!”
- Convincing growers to change was difficult initially but when old practices led to increased blight in their crops they quickly revised their opinions
- Now the trick to reduce costs is to use the cheapest products in low risk periods



Powdery scab soil testing



- A powdery scab soil test was developed some years ago and SRUC set up a commercial soil testing service
- The test has always been expensive, around £150 + VAT per sample (4ha)
- A grower might relate the cost of a test to the price of a tonne of potatoes or the cost of soil nutrient testing
- The perception is that because the cost of the soil test is so high, they might sample from a larger area of field
- Unknown to the farmer this makes the results less useful
- Honesty is important. Where risks in implementation exist they must be clearly spelled out – there is always a risk of a false negative where sampling is incorrectly carried out
- The cost:benefit ratio is important to establish

Cost:benefit ratio

- If a seed grower produces 30 t/ha the total production over a 4 ha block is 120 tonnes. The cost of the test is £1.25/tonne
- The grower only has to sell 0.5 tonne (0.4%) more seed to pay back the cost of the test. In fact, the reduction in grading staff alone when grading a healthy crop will more than pay back the cost of a test that results in less powdery scab

Manage the KT of research outcomes carefully

- No matter, how many caveats are made about a research outcome when it is being put into practice, if it gets a bad reputation from a single negative result it can be difficult to retrieve the situation
- Releasing research outcomes need to be carefully managed
- A case in point was hot water dipping of potatoes to control blackleg

Hot water dipping

Hot water dipping of potatoes to reduce inoculum on seed tubers

- Idea showed promise for control of blackleg when investigated by a PhD student
- A scientist grabbed the idea and developed a continuous flow hot water dipping machine and persuaded many growers to use it ‘to cure their blackleg’
- However, the biological detail was ignored that dipping before dormancy break was crucial otherwise eyes were damaged
- A series of law-suits later, the concept was dead in the water – although it still has potential

Agrochemical companies are expert at managing risk

- Amistar soil treatment can substantially delay emergence if the fungicide hits the seed tuber during application
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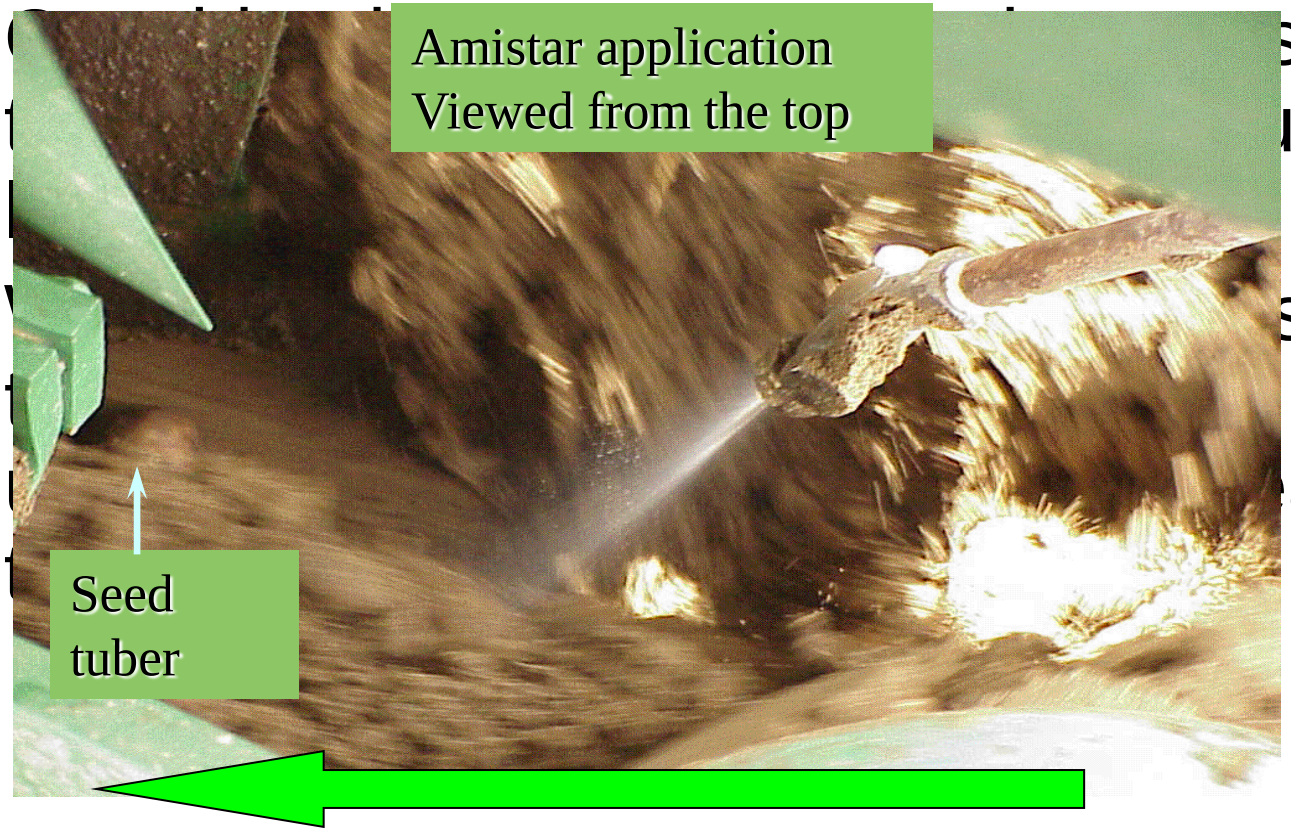
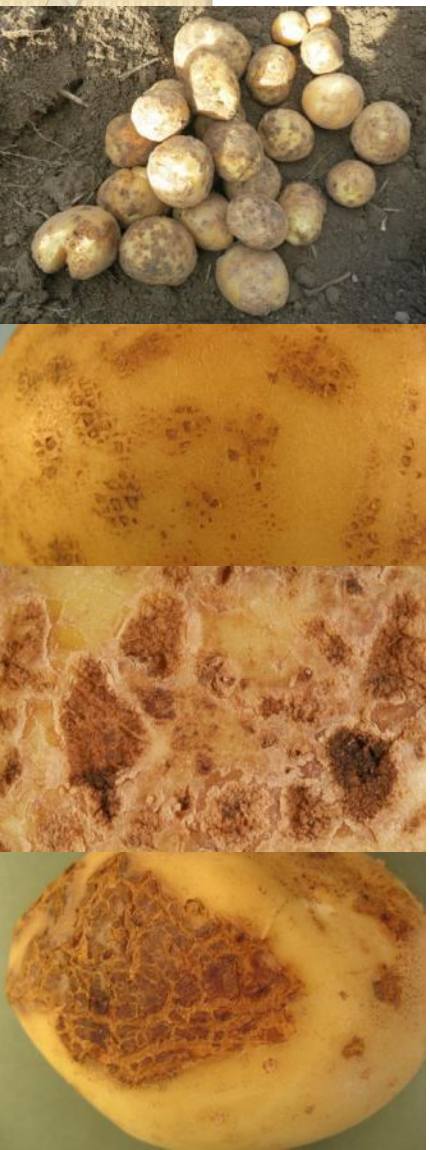


Photo courtesy of Syngenta

Use of fludioxinil for control of common scab



- During testing of fludioxinil as a seed tuber treatment since 2005, it was noted that reductions in common scab sometimes occurred
- The manufacturer did not include control of common scab on the label as the effect was not consistent
- But the tolerance for common scab in stocks destined for export is so high that any reduction would make a difference
- Fludioxinil was not approved for seed potatoes destined for seed production
- An Off-label Approval (EAMU) was secured specifically for seed export and the uptake has been substantial
- But growers are still convinced that the seed dressing will be a miracle cure!

Breeding for pest and disease resistance

- Hundreds of new varieties come out of breeding houses annually
- Some will be bred specifically with specific pest or disease resistance
- But most will fall by the wayside as end users are primarily interested in traits such as processing quality or consumer appeal
- “If only we could insert a resistance gene into a commercially accepted susceptible variety”
- Should scientists have a bigger profile to change consumer perceptions?

Conclusions

- Understand the target end-user
- Involve industry, consultants or even growers in your research so that it is focussed and you build up credibility
- They can guide you to place the research outcomes in a practical context
- Manage introduction and delivery of research outcomes carefully
  - Avoid raising premature expectations
  - Don’t over-sell the outcome
  - Simplify your outcomes into end user language
  - Establish the financial implications of the outcome

Thank you for your attention