1. **Common Scab**: control with minimum water use. Varietal susceptibility of both packing and processing varieties to Common Scab and soil moisture deficit tolerance.

2. **Herbicides**: Assessing the efficacy and weed spectrum control from a range of residual herbicide/residual herbicide combinations applied at standard crop timings.

3. **Irrigation efficiency**:

4. **Nitrogen**: movement & plant requirements under different irrigation regimes

5. **PCN (G. pallida) Resistance & Tolerance**: of new and established commercial potato varieties

6. **Sulphur**: nutritional importance in potatoes.
Common Scab demonstration will demonstrate minimum water use for control.

- Varietal susceptibility to common scab of both packing and processing varieties.
- Varietal soil moisture deficit tolerance.
- How irrigation regimes can be adapted to variety tolerance of common scab, saving water and costs.

**Background**
Common scab is caused by Streptomyces scabiei and other Streptomyces species that are widely distributed in most soils. Infection with common scab leads to rejection causing significant reduction in value, particularly in crops where skin appearance is important. Different varieties vary in their susceptibility to scab.

**SITE ONE:** Field ‘Summernpit Heath’
**Soil type:** Sand
**Varieties:** using small plots of different packing varieties: Estima, Jelly, Juliette, Lanorma, Leontine, Maris Peer, Maris Piper, Melody, Nectar, Red Fantasy, Rooster, Saxon, Soraya, Vales Sovereign.
**Timing:** Boom irrigation at two soil moisture deficits (SMD’s) 10 mm and 20 mm, using two adjacent boom runs, with a boom width of 72 m. One treatment half frequency of standard commercial practice but twice amount, other treatment standard commercial practice. Timing: from tuber Initiation (TI) for 4 weeks versus TI + one week; to three weeks.

**SITE TWO:** Field ‘Elveden Straceys’
**Soil type:** Sand
**Varieties:** Straceys: Small plots of different processing varieties: Shepody, Russet Burbank, Daisy, Royal, Brooke.
Trial located at beginning of irrigator run. Standard vs delayed-start irrigation for processing varieties

**Timing:** Irrigation comparison to target the most critical period for pathogen population development.
  a. Standard regime (for scab control regime) is for 28 days from Tuber Initiation (TI).
  b. Demonstration delays start of the regime from 7 days after TI to 21 days after TI.

**NOTES**
Herbicide Demonstration will demonstrate the efficacy and weed spectrum control from a range of residual herbicide/ residual herbicide combinations applied at standard crop timings.

**Background:** Residual herbicides, form a major part of a programmed approach towards weed control within potato production in the UK, but growers’ product choice is becoming increasingly limited. Residual herbicides containing Active Ingredient (A.I.) Linuron is widely used on potatoes grown on sandy/sandy loams to control weed species such as fat hen, mayweeds, nettle, orache and charlock. In addition Linuron provides some residual activity against bindweed, groundsel, redshank, knotgrass and annual meadow grass.

Many of these weed species not only compete with potato crops but also cause problems in vegetable rotations. The approvals for this A.I. usage lapse by 2018 and are considered unlikely to be renewed. Alternative actives are available e.g. metribuzin (significant varietal variation), clomazone, prosulfocarb and pendimethalin but many have restricted use on sands because of possible crop damage following application and have greater restrictions with regard to following crops which affect vegetable production.

Metobromuron is a herbicide newly available to GB growers and this trial looks at what role it can play in the development of integrated control programmes.

**Field:** Lodge Warren  
**Soil type:** Sand  
**Variety:** Maris Piper  
**Planting Dates:** First planting 21st April, second planting 27th May

**Demonstration:**
1. Demonstrating and monitoring the efficacy of 12 residual herbicide/ residual herbicide combinations options on all weeds present on site. Expected weed spectrum to include mayweed, groundsel, fat hen, nettle, annual meadow grass, bindweed, knotgrass and cleavers.
2. Herbicides used: linuron (Afonal), pendimethalin (Stomp Aqua); metribuzin (Shotput), diaquat (Retro), metobromuron (Praxim), clomazone (Gamit 36CS), prosulfocarb (Defy) and flufenacet / metribuzin (Artist).
3. Application rates: All treatments to be applied to two blocks – block A Standard timing and Block B delayed planting timing.

**This demonstration is part funded by Belchim crop protection.**

**NOTES**
Irrigation efficiency, application rates and scheduling demonstration: Assessment of a number of variables contributing to the efficient application of water (irrigation).

“Water is an increasingly expensive resource and we must all ensure we make best use of what is available. Understanding specific variety requirements to optimise marketable yield and quality is essential which firstly requires accurate and effective irrigation scheduling.”

Tony Bambridge, Managing Director, B & C Farming Ltd.

Background
Climate change, pressure for sustainable production and changes to the water abstraction licensing system makes efficient water management increasingly important. Potatoes currently account for 54% of the irrigation volume applied in England and Wales¹. Maintaining correct and consistent available soil moisture throughout the growing season is a key to producing high-yielding, quality potato crops.

Water-stressed plants are more susceptible to diseases such as common scab and pest problems than plants that have a consistent supply. Excess or poorly-timed irrigation may reduce yields and quality, can cause disease problems, leach nutrients from the root zone and waste the natural resource. Fluctuations in water availability may increase secondary growth and internal necrosis, whilst too little water reduces nutrient uptake, yield and increases the risk of bruising.

Field: Straceys & Summerpit Heath
Soil type: Sand

Demonstrations: Irrigation efficiency:
Application rates: Pre- and post-irrigation measurements with Theta Probe combined with Elveden probes to track soil wetting pre- and post-irrigation resulting from: Ridge/bed shape: Flat and ridged profiles
Scheduling: Smart methods, weather prediction confidence, probes types, plant and 'smart' sensors.


NOTES
Nitrogen demonstration: Will assess nitrogen movement and plant requirements under different irrigation regimes.

**Background**
Correct use of nitrogen makes the difference between an average and top-performing potato crop but nitrogen is notorious for leaching, denitrification and volatization.

A potato crop consumes 60-80% of its total nitrogen needs during the tuber initiation and bulking stage of growth. Over or under-application of nitrogen will have serious consequences. Too much delays the maturity of the crop, reduces yield and dry matter, delays skinset, makes defoliation more difficult and wastes resources. Too little can stunt growth, cause premature death of the plant, lower yields and increase susceptibility to disease such as *Alternaria* and *Verticillium* wilt.

**Field:** Straceys
**Soil type:** Sand
**Variety:** Russet Burbank

**Demonstration:** Measuring soil nitrogen at emergence and post-season at 0-30 and 30-60 and 60-90 cm depths.

**Six treatments.** Irrigation frequency/rate (8 mm, 15 mm, 25 mm) at each irrigation using boom and split-N comparison:
1. Standard irrigation, standard split N
2. Standard irrigation, all N in seedbed
3. Half-dose frequent irrigation, standard split N
4. Half-dose frequent irrigation, all N in seedbed
5. Over-watered irrigation, standard split N
6. Over-watered irrigation, all N in seedbed

**NOTES**
PCN (G. pallida) Resistance and Tolerance Trial:
Comparing tolerance and resistance of new and established commercial potato varieties to Globodera pallida (the white potato cyst nematode).

**Background:** The potato cyst nematode - Globodera pallida is an increasing issue within many potato rotations in the UK following the widespread growth of varieties susceptible to this pest in rotations over the last 30 years. It is estimated that 64% of the potato producing land base has detectable levels of PCN. A combination of methods including extended rotations, biofumigation, granular nematicide pesticides and cropping with resistant varieties are currently used to reduce the effect of PCN on yields and its multiplication within the UK land base.

**Field:** Elveden Warren
**Soil type:** Loamy Sand
**Varieties susceptible to G. pallida:** Shepody, Cara, M.Peer, M.Piper
**Varieties partially or fully resistant to G. pallida:** Forza, Royal, Performer, Arsenal, Eurostar, Innovator, Panther and Lanorma.

**Demonstration:** This replicated trial (4 replicates) will compare the performance of 12 varieties (including 8 partially or fully resistant varieties) within a sand soil type with a known G.pallida infection, with regard to PCN multiplication (resistance) and yield performance (tolerance). All varieties are grown with and without a nematicide treatment – fosthiazate.

**Planting Date:** 21st April 2016
**Assessments:** PCN Population eggs/g pre and post the crop. Initial G. Pallida population: between 2 to 40 eggs/g on this site
**Yield assessment:** t/ha (to compare tolerance to PCN)

**NOTES**
**Sulphur nutrition demonstration:** a replicated trial to determine the importance of sulphur nutrition in potatoes.

**Background**
Significantly reduced atmospheric sulphur depositions and continued use of fertiliser with low sulphur content has led to sulphur deficiency in crops in many regions.

Sulphur is essential for protein and amino acid synthesis which aids effective utilisation of applied nutrients such as nitrogen, the production of chlorophyll and the plants resilience to disease.

The trial is sponsored by CUPGRA and is part of a series of three trials conducted in 2016 to gather data for the review of RB209 Fertilizer Recommendations.

**Field:** Straceys
**Soil type:** Sand
**Variety:** Russet Burbank

**Demonstration:** Replicated trial with three treatments (nitrogen application adjusted based on N content of sulphur fertilizer):
1. No sulphur
2. Sulphur applied as S liquid at 125kg/ha SO₃
3. Sulphur applied as ammonium sulphate at 125kg/ha SO₃

**NOTES**
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5 July, Open Day  
4 August, Farm Walk  
1 September, Farm Walk

**SPot West** - WB Daw & Sons, Staffordshire
19 July, Open Day  
19 August, Farm Walk  
8 September, Farm Walk

**SPot Scotland** - Bruce Farms, Perthshire
12 July, Open Day

**More events**

**Potatoes in Practice 2016**
11 August, Dundee

**Potato Europe 2016**
14-15 September, France

**Seed Industry Event**
3 November, Fife, Scotland

**Fruit Logistica 2017**
8-10 February, Berlin

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