Stripping the light fandango – OSR style!

A NARROW-SPACED crop on the left produced wispy stems which bent easily under the combine, while the sturdy plants from wider spacing are pictured on the right

VARIOUS methods of seeding oilseed rape crops have been used over the years, but there's a growing fan base for strip-till seeding.

Aimed at maximising yield by reducing weed burdens and increasing light interception, this method is becoming increasingly popular in England.

Now, a case study by strip-till specialist machinery manufacturer, Mzuri, has shed some light on what works and what doesn't.

Springfield Farms

A 170ha arable farm based at the heart of Worcestershire.

Run as a commercial operation, it also has a number of field-sized trials, including experiments aimed at reducing weed burden and improving profitability through maximising light interception and better soil health.

Previously using a plough and press system, the farm has now been on a Mzuri strip-till system for seven years and has seen the yields and organic matter double.

Trials to determine the optimum method of establishing rape:

1. Rape drilled with Pro-Til 3T in full striptill mode.

In autumn 2016, the farm ran three different drilling experiments within their commercial oilseed rape crop to drill down to the formula of perfect rape establishment.

The first two fields (16ha) were inter-row drilled straight into standing wheat stubble on August 17. The area was drilled with the Pro-Til 3T in full strip-till mode.

The establishment proved to be very even, which the farmer put down to the drill's breaker leg, producing a strip of friable soil, its ability to go straight into moisture with a large amount of surface residue and the dual reconsolidation feature awarding great seed-to-soil contact.

The front coulter leg also placed a band of fertiliser below the seed which helped with rapid root establishment.This produced strong, healthy crops which averaged 5.2t/ha, maintaining the farm's long-term average on strip tillage.

2. Rape seeded into wheat stubble in direct drill mode.

This trial involved a full 8ha field drilled with the Pro-Til 3T with the front legs lifted out of operation to replicate zero tillage as closely as possible. This means the machine hadn't generated the mini tilth zone the breaker leg would normally produce – but still applied the same rate of banded fertiliser on the surface.

Despite it being one of the best fields in terms of organic matter, the crop struggled throughout the year but the farm took the decision to treat it the same as any other field to ensure a fair comparison. Springfield Farms reported risks associated with no soil disturbance cultivation, leaving the crop vulnerable to slug attack. Subsequently, rape had pigeon damage and high rates of weed infestation due to uneven establishment.

The trial yielded 3.4t/ha which is still more than the farm achieved when ploughing – this was attributed to good soil structure supporting the crop.

The farm believed that zero tillage has its place in the right environment, but it didn't find it sustainable for its heavy Evesham Lias Clay.

The lack of a nursery seedbed stunted the growth and introduced a risk factor which they believe had cost them over 1t/ha in yield, compared to the first trial in identical conditions but full strip-till mode.

3. Rape into bean haulm in full strip-till mode.

The last 10ha field was seeded in full strip-till mode straight into bean haulm – a rather unconventional rotation which was used to run two new experiments.

Firstly, experimenting with different row spacings and their impact on yield and secondly, trialling the feasibility of profitable two-year break cropping.

Springfield Farms believed that rape after beans made the best use of available chemistry for controlling blackgrass, with the added advantage of surpassing the wheat return.

The Pro-Til 3T coped well with the thick bean haulm and produced a consistent, friable seedbed. Residual fixed nitrogen and band fertiliser under the seed boosted the crops, resulting in fast germination and strong root development.

The rape was seeded relatively late (mid-September) which presented issues of its own. For instance, a warm, humid spell brought the onset of flea beetles, stressing the crop.

Despite this, the crop recovered well and went on to become one of the best fields – which supported the theory of increased light interception contributing towards stronger and healthier plants.

The 10ha field was divided into three trials plots with different coulter set ups – the Mzuri standard spacing of 330mm, double row spacing of 660mm and a narrow 165mm spacing achieved with a dual coulter kit.

The narrow spacing showed most promise throughout the winter but as spring came along, the extra wide 660mm spacing took the lead thanks to better light interception. By harvest time, it was apparent that the wider spacing had produced much stronger plants that stayed upright.

In comparison, patches of the narrower spaced plots were buckling under the weight of the promising yield that the thinner stalks could no longer hold.

Across the field, Springfield Farms broke their record and harvested an impressive 5.7t/ha by trailer weight.

INTER ROW strip-tilled crops produce plenty of vigour

The farm identified seven contributing factors:

- Well-structured soil. Seven years into strip tillage, the farm's organic matter levels doubled and reduced traffic has eradicated compaction.

What was previously heavy Evesham Lias Clay is now a well-aerated, friable soil which presents the perfect medium to drill into.

- Moisture retention is a key feature and the surface residue is great for that – Springfield encouraged farmers to retain as much surface straw as possible.

The high beam clearance of the Mzuri Pro-Til allowed it to drill into huge amounts of straw, which not only save money due to one pass drilling, but it sealed in moisture to help the crop get away quickly and evenly.

- Light interception is another plus for Springfield, which is a huge advocate of wider row spacings. The resultant good light interception produces a healthier, stronger and higher-yielding plant.
- Springfield also advised to look out for a drill that can place the fertiliser below the seed to give the roots a boost. The Mzuri Pro-Til 3T's dual hopper has this facility and the fact that it places the product in bands also results in a substantial saving.
- A front leg with wing produces a light tilth around the seed and make sure that the seed is always placed centrally to the tilled strip.

The Pro-Til has a side-to-side pivot on the seeding arm which results in even germination from edge to edge of the field, including headlands.

- Seeding depth accuracy is important for even germination. A drill that can exert pressure hydraulically onto individual coulter arms will always do it best as the seeding depth remain the same, even in undulating ground.
- Good seed-to-soil contact is recognised by all as being paramount to strong and even crop establishment. Air pockets or contaminant contact are detrimental to the seed – so a drill with front leading discs to clear the residue and good reconsolidation is key to achieve good, residue-free seed-to-soil contact.