



# Better yields through till-seeding

*A keener agronomic focus is helping one Yorks farmer achieve better OSR yields — leading to renewed enthusiasm for growing the crop.*

*By Warren Landles and Angus McKirdy*

**'There's more satisfaction in getting extra yield from the crop than there is from simply lowering the level of expenditure.'**

**A**chieving improved returns from OSR — starting with better establishment — has helped reinvigorate Mike Wilkin's interest in the crop as a profitable break within the cereal rotation.

"By being prepared to adopt a different establishment method for rape, we've been able to push crops forward and lower our

input costs at the same time — with the upturn in prices being an added incentive."

The process of evaluating the alternatives began four years ago following a significant change in the structure of the business. Farming 195ha of land at Steadfield House, Dalton on Tees, near Darlington, Mike Wilkin joined forces with his neighbour, Stuart Gibbon, to share knowledge, and pool labour and machinery — with each partner maintaining ownership and control of their own farms.

Working as a team, including his son, Robert, Mike Wilkin says it has given both farms a much needed boost.

"It's more interesting now and we can drive each other on — which has been especially valuable during the past two difficult seasons.

### **Working together**

"By working together, we've managed to successfully establish crops on all but 10 acres (4ha) of our combined arable land."

The link-up led to a halving of the overall tractor and machinery fleet in favour of fewer, larger machines. A total of just under 390ha Grade 2-4 clay and clay loam soils are farmed.

Cropping includes winter wheat and barley, naked oats and spring beans, with cereal straw being removed for animal bedding. The land benefits from pig and cattle FYM — helping to boost the soil organic matter and reduce fertiliser costs overall.

Both growers regularly test their land to establish the precise phosphate and potash indices on each field, and a total of five OSR varieties are grown — mainly hybrids — extending to around 100ha across the two farms.

Mike Wilkin says his land is capable of producing cereal yields of up to 12t/ha, with OSR hitting 5t/ha on the best fields.

"I've grown rape since 1979 and have always believed it needs room to grow, rather than creating a thick 'carpet' of plants. I've never been afraid to cut back on the seed rate, and have used min-till for a number of years now.

"In particular, the use of the till-seeding technique has shown what's possible on our challenging ground."

### **Now single pass system**

Working with one of his agronomists, Philip Marr of Masstock, OSR establishment has moved from being a plough, press and combi-drill operation — requiring three passes — to a single pass system, using an OPICO Variocast seeder to broadcast the seed in bands behind the legs of a HE-VA five-leg subsoiler (an operation known as till-seeding).

The subsoiler legs were set to work at a 20cm depth last year because of the atrocious soil conditions to remove surface compaction, whilst maintaining a constant 8kph forward speed behind the farm's 190hp Case tractor.

"We generally use a seed rate of around 50 seeds/m<sup>2</sup> but this was increased on the very heavy ground last backend."

The leg depth is set once it's known how far down the compaction layer has penetrated the soil. "There's little point in ▶

► working too deep as wheel slip would only add to the problem — with fuel use increasing as a result.”

Due to the exceptionally wet weather last year, some of the rape was established conventionally on ploughed ground which had been destined for naked oats, admits Mike Wilkin.

Comparing the different establishment techniques used, he reckons till-seeding has almost halved his OSR establishment costs — down to about £60/ha — whilst

improving the soil structure at the same time.

“We had major doubts about establishing OSR on some fields last year because of the state of the land after combining and straw carting. But we decided to use the subsoil-and-Variocast approach — going on as early as possible.

“The cold, wet soils slowed down the degree of nitrogen mineralisation in the following period, and early crop growth was hindered as a result. Some areas

looked very sparse with less than 20 plants/m<sup>2</sup> recorded, and because of the lack of plant competition, we needed two herbicide applications to eliminate broadleaf weeds which had reached something of a historic high.”

Pigeons and crows then took advantage of the gaps between the rows, leading to some plant losses, he admits.

“But our faith in the system was rewarded when the soils began warming up in April — and by the end of May, we were ►

## Band-sowing benefit



*Philip Marr has done extensive trials comparing different establishment techniques. He reckons till-seeding is both quick and effective.*

Research over the past eight seasons has shown the yield benefit of establishing OSR using the band-sowing technique, together with a subsoiler.

Seed broadcast at 50cm row widths, using a Variocast seeder, led to a yield boost of 1.24t/ha last season, compared with a single pass using a set of discs followed by a power harrow/drill combination, according to Philip Marr, northern technical development manager for Masstock.

The Variocast unit places the seed just behind each subsoiler leg — operating at a depth of 25cm — before consolidation with a packer roller.

“Trials on our agronomy site at Brotherton near Pontefract on a clay loam soil type show that plants are given room to develop thick, multi-branching lateral stems at this row spacing. Fast-developing hybrids are particularly well-suited to the till-seeding system, with the plants growing well and quickly filling the spaces in-between the rows.

“Some growers get nervy when they see thin crops in the autumn, but provided the soil structure is right, most are pleasantly surprised by the yields coming off the combine.”

But he recommends that the row width should be limited to no more than 50cm otherwise plants struggle to compete with pigeons and weeds.

Successful rape establishment relies on two important criteria, believes Philip Marr. “Creating a first-rate, open soil structure lets water get down into the soil profile and ensures good seed-to-soil contact — both of which are essential in the creation of strong tap roots.”

The working action of the subsoiler leg tends to ‘trap’ the seed in the soil at around 5-8mm depth, and using a set of Cambridge rolls straight after sowing helps improve the seed-to-soil contact even further, he adds.

“OSR roots are essentially ‘lazy’ in that they take the least path of resistance. The slightest bit of soil compaction creates horizontal rooting — which in the case of some min-till techniques can occur just 10cm below the soil surface.

“These roots are then left high and dry, and unable to reach soil moisture during dry spells, or to draw up soil nutrients.” This year’s dry March and April highlighted the problem within some of Masstock’s min-till plots, he says.

“The importance of opening up the soil profile so strong tap roots are allowed to develop can’t be overemphasised.”

Philip Marr highlights one trial last season comparing different establishment techniques. The roots were weighed during the crucial growth periods — November, March and July — and the subsoiled and Variocast plots consistently gave the greatest root weight at each timing (see figure).

During July, the roots weighed 130g — around 50g more than plants established by discs and a drill combination, he notes.

“Research has also shown that in dry years, the action of a subsoiler leg has helped pull moisture up the profile to aid germination. Where seed had been

broadcast across the width of the machine — rather than dropping it in line with each leg — germination didn’t occur until it rained.

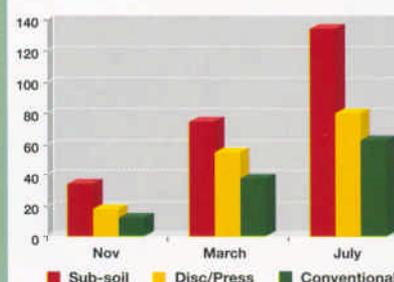
“Another benefit of using a subsoiler is that it minimises the level of soil disturbance to only around each leg — helping to limit weed germination.

“Furthermore, straw mulch from the previous crop is left untouched, which suppresses inter-row weed growth.”



*The subsoiled and Variocast plots consistently gave the greatest root weight.*

### Impact of establishment technique on root weight (g/plant)



cv. Excalibur

Source: Masstock Smart Farms (Brotherton, Yorks 2007/08)



"OSR is capable of hitting 5t/ha on our best fields," says Mike Wilkin.

## Efficient nutrient placement

Incorporating granular nitrogen into the seedbed while till-seeding, as part of a single pass operation, is currently under investigation in Masstock trials.

"The system is helping to boost nutrient efficiency by adding nitrogen to the precise point where it's needed by the seed and emerging plants," says Philip Marr.

"Growers know the benefits of an autumn applied nitrogen application — particularly when the soil nitrogen supply index is between 0 and 2. Making nitrogen available throughout the first four

weeks of the life of a crop significantly aids plant growth and the final yield.

"Additionally, better precision will help farmers tackle the 30kg/ha autumn-applied N max limit of inorganic fertiliser within Nitrate Vulnerable Zones. By treating just one-third of every m<sup>2</sup> within a field in a narrow band, the application rate can be increased if the yield expectation is high."

- The trials will be extended next season to include OPICO's new Nitro-jet fertiliser system, which applies liquid fertiliser in bands.

### Farm Facts

*Current*

#### Mike Wilkin's equipment

##### Tractors

- **Main tractor:** Case IH CVX1190 (190hp, 4yrs old)  
Case Maxxum 5130 (100 hp, 16yrs old)  
MF 390 and loader (80hp, 14yrs old)

- **Combine:** Case Axial Flow 2388 (300hp, 6yrs old)  
HE-VA five-leg subsoiler  
Opico variocast seeder  
Simba Culti-press (4.6m)  
Väderstad drill (4m)  
Cambridge rolls (6m)

#### Stuart Gibbon's equipment

##### Tractors

- Claas Axion 830 (200hp)
- Valtra T140 (140hp)
- Vicon round baler
- 6f Lemken plough and furrow press

#### Jointly-owned equipment

- **Sprayer:** self-propelled Sands sprayer (24m)
- **Fertiliser spreader:** Kuhn Axis 30.1 with 24-36m capability

#### Equipment sold when two farms came together

##### Mike Wilkin

- Kuhn power harrow and drill combination (3m)
- 4f Lemken plough with furrow press
- Tractor: John Deere 7810 (175hp)

##### Stuart Gibbon

- Lemken combination drill (3m)
- 5f Lemken plough

► congratulating ourselves on the quality of the crops. They looked tremendous.”

After viewing his rape through the sprayer window during a fungicide application in late May, his thoughts soon turned to harvestable yield. “My gut feeling is that we could reach 4t/ha this harvest.”

Further evidence of the rooting ability of till-seeded crops was borne out in the plant tissue testing. “When compared with our conventionally established crops, the till-seeded plants contained higher levels

of nutrients, which scientists put down to their strong root system.

“The subsoiler combination has extended the options for us, while keeping the system simple. With Philip Marr’s support, we’ve got confidence to push our yields even further, and we’re learning to time our other crop inputs more precisely.

“There’s definitely more satisfaction in getting extra yield from the crop than there is from simply lowering the level of expenditure.” ■



*The speed of establishment is enhanced by the nitrogen applied at sowing time.*