

UK TRIAL RESULTS AND YIELD TRENDS FOR OILSEED RAPE

Simon Kightley
NIAB

The 2004 growing season

UK oilseed rape growers have just endured one of their most difficult years, with an estimated 11% drop in yield, despite of a small (3%) increase in cropping area. The main problem was a very dry period, in August/September, which affected a large area of the country between the River Thames in the south to the Humber in the north, and from the East coast, across to Wales. The direct consequence was a high proportion of crops emerging very late and unevenly. Some of these were written off at an early stage and re-drilled with winter wheat, where herbicides had not yet been applied. In other cases the fields were re-drilled in spring, predominantly with barley or spring rape. The overall effect was to almost cancel out the 20% increase in winter rape planting that some estimates had given.

The second effect of the poor establishment was observed in spring. In the area described, crops tended to flower late and unevenly and there were numerous reports of severe pod abortion. This was at first attributed to frost damage and nutrient stress in the rather arid conditions at the start of flowering. Now there is a general consensus that the real problem was infestation by pollen beetles, (*Melegethes spp*) which proved exceptionally difficult to control, particularly in fields showing a wide range of crop development. Normally, the rather cool temperatures at the start of flowering, in late March – early April, suppress beetle activity, which is more commonly a serious threat to spring rape. In 2004, many crops were 3 – 4 weeks late coming into flower and the beetle numbers built up unobserved by farmers who would normally rely on a single spray and then forget about the problem. As always, in the UK, pigeon grazing contributed to the problem, continuing their activity on the more backward crop areas, effectively holding back the start of flowering. With good rainfall at the beginning of May, most crops appeared to recover well but travellers flying into Eastern England would have struggled to spot any perfect fields of dense yellow. Most crops retained areas of poor growth, or complete failure, through to harvest.

Although crops across the whole of the south of England were shorter than normal, there was considerable lodging during periods of wet and windy weather in June/July. This provided more of a test for variety lodging resistance than we have seen for several years.

The north of England experienced particularly good establishment and flowering conditions and the yield potential as harvest approached looked excellent. However, here and further north into Scotland, the arrival of wet weather at the beginning of harvest ruined many crops, causing sprouting of the grain or shedding.

Variety trials

The UK system currently involves a 2-year test period for varieties entered into the National List system. At the end of this time the best are selected for a further year of trials before being considered for addition to the HGCA Recommended List, the primary influence for commercial variety choice. The Recommended List itself uses a 4-year data matrix, smaller than many arable crops, but reflecting the very fast turnover of varieties.

Table 1 lists the performance of varieties during the 2004 season and within the 4-year matrix. The varieties are ranked in order of gross output. This is a relatively new term, used to describe the value of the seed yield, adjusted for the value of the oil content. (Growers normally receive an additional 1.5% of the contract price for every 1% oil content over 40%.)

Table 1 – Winter oilseed rape trial results – Gross Output

Variety	Type	Status	4-year mean 2001-04	2004 mean	Lodging resistance (1 – poor, 9 – good)	Breeder	Country
Lioness		Candidate <u>ended</u> ^{NEW}	108	110	8	DSV	Germany
NK Bravour		Recommended ^{NEW}	107	107	8	Syngenta	Germany
Castille		Recommended ^{NEW}	105	107	8	Monsanto	France
Winner		Recommended	104	103	7	Raps	Germany
NK Victory.		Recommended ^{NEW}	104	101	8	Syngenta	Germany
ES Astrid		Recommended ^{NEW}	104	107	8	Euralis	France
Toccata	Hybrid	Recommended	104	107	7	Syngenta	Germany
SW Gospel		Candidate ^{NR}	103	102	8	Svalof Weibull	Sweden
Labrador		Candidate ^{NR}	103	103	6	Momont	France
Exact	Hybrid	Year 4	103	103	6	Monsanto	UK
Expert		Recommended	102	105	8	Momont	France
Verona		Recommended	101	99	7	Danisco	Denmark
Caracas		Year 4	101	103	7	Monsanto	UK
Royal	Hybrid	Recommended	101	102	7	Syngenta	Germany
Recital		Recommended	100	100	7	Syngenta	Germany
Fortis		Recommended	100	102	7	Syngenta	Germany
Aragon		Candidate ^{NR}	100	94	7	NPZ	Germany
Disco	Hybrid	Recommended	100	96	7	Raps	Germany
Elan	Hybrid	Recommended	100	100	8	NPZ	Germany
Grizzly		Candidate ^{NR}	99	100	8	R2N	France
Canberra		Recommended	98	103	8	Monsanto	France
Courage		Recommended	97	96	7	Advanta	Netherlands
Tequila		Recommended	97	97	8	Danisco	Denmark
Mendel	Hybrid	Recommended	97	94	8	NPZ	Germany
Escort		Recommended	96	98	6	Force Limagrain	France
Control mean (t/ha)			4.7	4.2			

NEW = Newly Recommended variety (1/12/2004); NR = Candidate not recommended

Data source: HGCA. Full data can be seen at www.hgca.com

The current market leader is Winner, a conventional, open-pollinated variety from Germany, which has consistently matched the best hybrids in trials. It made up about 30% of the certified seed sales for 2003/04 and was followed by Canberra and Recital on 13 and 11%, (seed trade estimates). Hybrids comprised about 13% of sales and of these Royal was the most popular. Just over 30% of the national crop was grown from farm saved seed, for which farmers are required to pay a royalty payment to the breeders. In fact the seed market has become increasingly fragmented in recent years. Traditionally the top yielder on the Recommended List was guaranteed a very large market share but the very low crop prices in 1999/2000 led to an increased up-take of non-recommended varieties, sold at attractively low prices. This included several Common Catalogue varieties with no independent data from the UK!

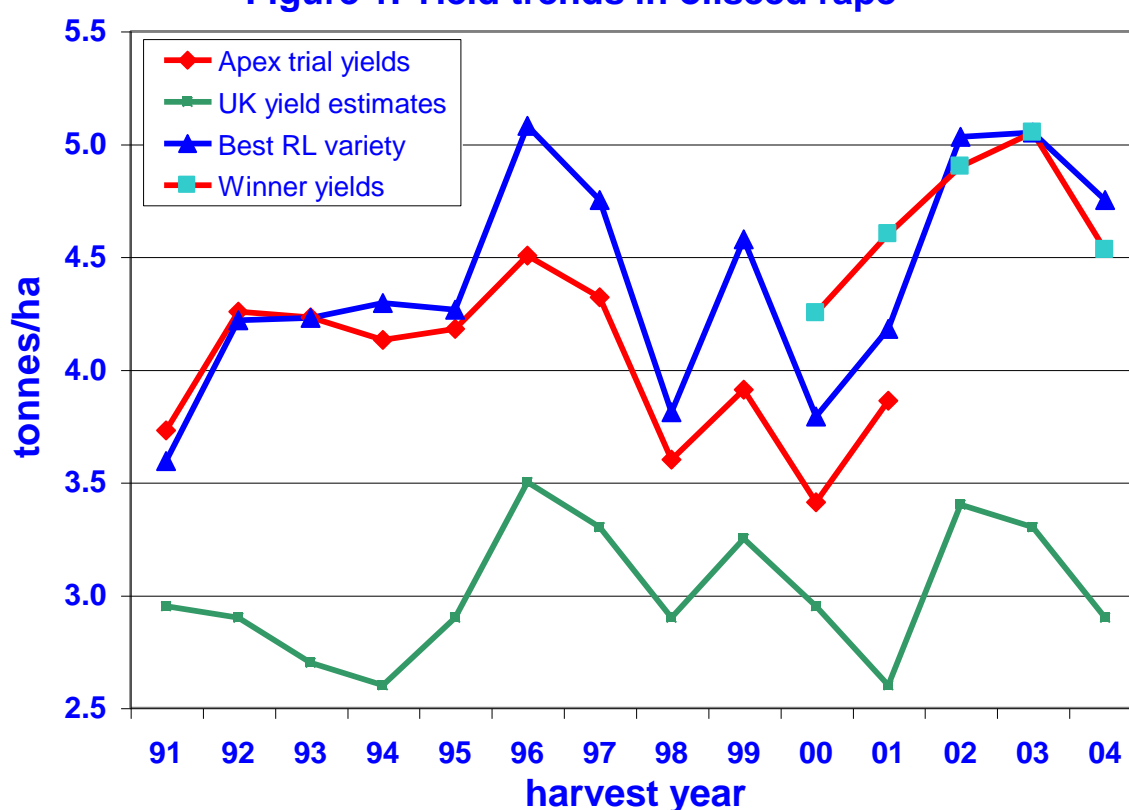
The new Recommended List has just been announced (1 December) and, clearly, we will expect to see Winner's market share eroded by several of the more promising newcomers listed in table 1. Other than high yield, good lodging resistance is the most highly valued variety characteristic for British farmers, with relatively little emphasis being placed on disease resistance. This has resulted in the very rapid uptake of the lodging resistant variety, Expert, which was added to the Recommended List last year and is estimated to have reached a 14% market share of the crop for 2005. Most of the candidates for recommendation have very good lodging resistance. This includes the variety with the highest gross output, Lioness, which is particularly noted for its very high oil content of 46.5%, compared with average figures of 43-44%.

Cost saving at harvest is increasingly a topic for discussion and there has been a move away from swathing crops, in order to accelerate maturity, towards a greater proportion of crops that are desiccated or even left to reach natural maturity. For this reason and for general ease of harvesting there is considerable interest in short, so-called low biomass varieties, typified by Canberra, and including Castille, Caracas and ES Astrid in the list above.

Yield trends

As the table of trial results shows, the control mean for 2004 was about 11% down on the 4-year mean. Rape yields in Britain do tend to be highly variable and this is illustrated well by Figure 1. The base line represents the national yield estimates for the period 1991-2004 supplied by the Department of the Environment, Food and Rural Affairs (Defra). This has been taken by some as an indication that varieties have not been delivering a yield improvement but this is an over-simplification. The other lines are the trial mean yields for the widely grown variety Apex, since it entered trials, the yield of the best recommended or candidate variety, and the first four years of Winner. They show a fairly steady improvement over Apex, with Winner achieving a yield advantage of about 12%.

Figure 1. Yield trends in oilseed rape



Data sources: Defra, HGCA, NIAB

The close relationship between trial and farm yield trends is very encouraging. Clearly, all four lines are subject to major seasonal influences, most of which are easy to recall:

- Spring droughts delaying or limiting fertiliser uptake (1994, 2003)
- Periods of prolonged frosty weather at flowering (1993)
- Wet winters with poor root development leaving crops susceptible to early senescence in response to sudden onset of hot dry weather in summer 1997/1998)
- Periodic disease surges, most notably light leaf spot in the mid '90s
- Combination of tall, lush crops and low light intensity during pod fill (2000)
- Poor establishment and pollen beetle damage (2004)

Progressive diminution of sulphur levels in the soil has also been blamed for generally poor crops in some areas.

Growers should be encouraged that they are indeed receiving a steady supply of improved varieties. At the same time breeders must appreciate that their varieties are being evaluated under very unstable conditions in the UK and should always invest in the most comprehensive screening possible, to be sure of identifying their best material for UK conditions.

Conclusions

The 2003/04 growing year proved particularly difficult because of late and patchy establishment, which led to high levels of pest damage in spring. This should be viewed as one of a succession of adverse seasons, which have tended to disguise variety improvement in recent years. The new HGCA Recommended List, should soon be strengthened with the addition of a number of very promising candidate varieties, combining high gross output with very good field characters.