Increased Use and Better Timing of Fungicides Improve UK Oilseed Rape Yield

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Humans have used oil pressed from the seeds of plants known as rape for thousands of years. Rapeseed oil is usually blended with other vegetable oils for the production of various cooking oils, margarines, mayonnaise and salad dressings. After the rapeseed oil has been pressed out, the solid remains of the rapeseed are used as an animal feed. The UK is the 7th largest producer of rapeseed in the world with production in 2012 of 2.5 million tonnes valued at £1.0 billion.

Phoma stem canker and light leaf spot are the two most serious diseases of winter oilseed rape in the UK. The Phoma fungus survives for several years on oilseed rape stubble. Epidemics are initiated in autumn by spores released from infected stubble. The spores infect leaves and cause Phoma leaf spots, the pathogen then spreads systemically down the stem and causes stem cankers destroying the stem’s vascular system which restricts water uptake. Light leaf spot is a polycyclic disease with repeat infections occurring throughout the year. Autumn infections of light leaf spot are the most damaging, causing leaf loss, crop stunting and plant death.

Prior to 1994, the proportion of crops treated with fungicides was low (40-75%). Since then, the proportion has generally increased. After 1995 over 80% of crops have been sprayed (corresponding to the beginning of a two-year increase in yields in commercial crops) with over 90% being treated since 1998. The mean number of sprays has gradually increased from <1 with approximately 2 sprays being applied to each crop by 1998 [1]. In 2011, the number of fungicide applications reached 2.91 [3]. The timing of fungicide sprays has changed. Prior to 1995, crops were mostly sprayed in the spring and summer. However, since 1995 the proportion of crops receiving a spray in the autumn increased to 80% from 2-3% in the earlier years. Research has shown that fungicide treatment in the autumn is important for control of both light leaf spot and Phoma canker and this message has been taken up by the industry [1]. Fungicide application must be timed to that of spore release. This timing is difficult for growers to determine, and, as a result, a system was developed where growers are warned when a threshold of 10% leaf spot incidence occurs in their area and fungicides are applied at this time [1]. Autumn sprays are needed to control the early epidemics usually with a follow-up treatment in the spring.

From 2004 to 2011, oilseed rape yields have been on a steady upward trend from 3.0t/ha with the highest ever national oilseed rape yield in 2011 (3.9t/ha). Fungicides contribute substantially to the yield of oilseed rape. Average responses to treatment usually range between .5t/ha and 1.5t/ha where disease pressure is particularly high [2]. A recent assessment by UK researchers estimated that without the use of fungicides, oilseed rape production in the UK would decline by 19% [2].

References