

Response of Oilseed Rape to Interference from *Stellaria media*

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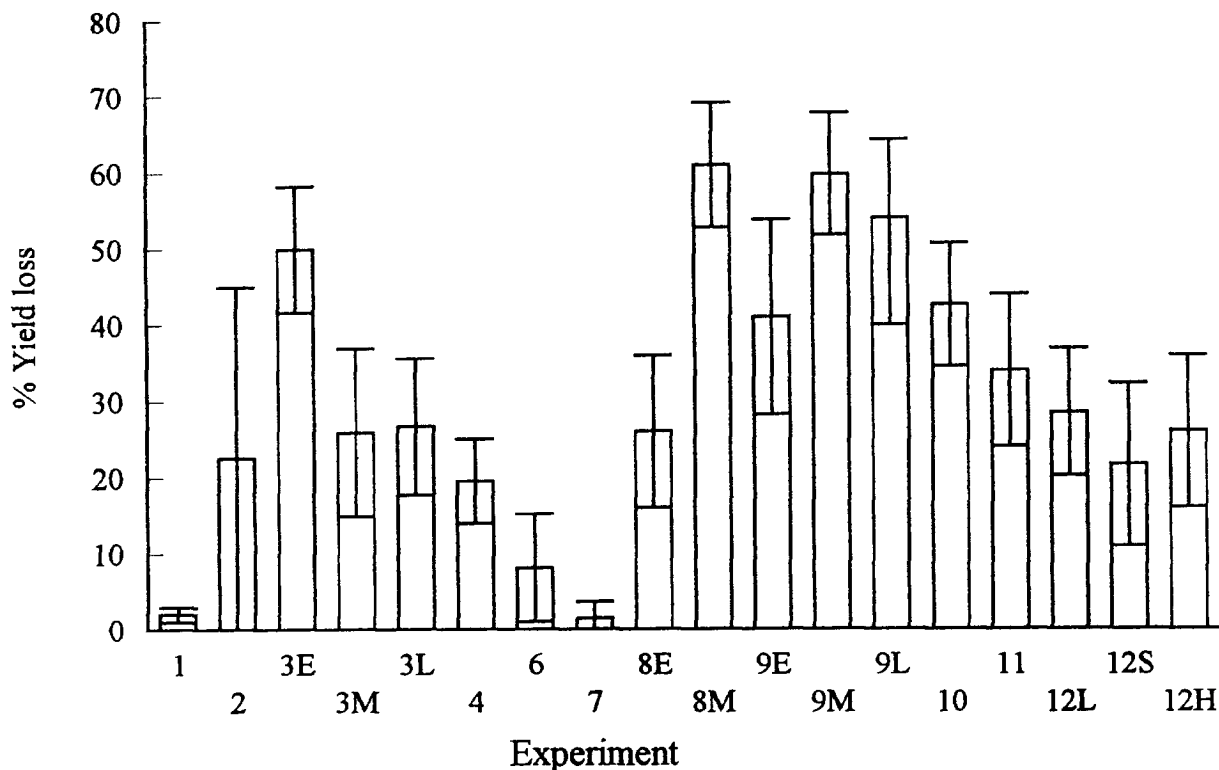
Over the last five years a number of experiments have been carried out by the participants in this project, to investigate the effects of broad-leaved weeds on the growth and yield of winter oilseed rape. The object of the work was to identify the competitive effects of weeds, so that more informed decisions could be made on the need for their control, with the overall aim of optimising herbicide use.

This summary reports on twelve experiments which have investigated various aspects of interference between rape and *Stellaria media* L. (common chickweed). The experiments examined the effects of a range of densities of *S.media* on the rape and studied interactions between weed competition and crop agronomy.

Yield losses caused by this weed were often large but differed greatly between experiments, 100 *S.media* plants/m² causing between 1% and 61% loss in yield (mean = 31%) (Fig.1). The reasons for the variations in yield loss were related to the vigour of the rape crop in December, the greater the crop dry weight at this time the smaller the final yield loss (Fig.2). Rape weight in December was closely correlated to heat units (base temp 5°C) between sowing and December. Intraspecific interference in *S.media* played an important role in determining its competitive effect, as high densities were often no more competitive than lower ones, due to interference between individual weed plants.

Effects of crop agronomy on weed interference Delaying sowing of the rape until late September slightly increased the competitive effects of the weed compared to late August / early September sowings, as it reduced crop weights in the winter. The advantages of early drilling were not as clear as they had been in earlier work studying the competitive effects of volunteer barley. Climatic differences between years often had greater effects on crop vigour, and thus competitive ability, than drilling date. Weed interference tended to be greater at low crop densities but only when densities were below 25-50 plants/m². Autumn nitrogen (50 kg/ha) increased both crop and weed growth but failed to affect the interaction between them.

According to our data, rape weight in winter is the critical factor in determining the likely effects of *S.media* on yield. The actual infestation level of the weed is of secondary importance, as a vigorous rape crop will compete successfully even with a vigorous weed infestation and a poor rape crop will be sensitive to very low weed densities. It would be preferable for decisions on weed control to be delayed until late autumn or early winter, as by this time the vigour of the rape crop will be clear. Although such a strategy would be acceptable for winter cereals, it is less acceptable for winter oilseed rape. There are only a restricted number of herbicides available for the control of broad-leaved weeds in this crop



E,M,L = early, mid and late sown:
 L,S,H = low, standard and high crop density
 Error bars = +/- 2 x s.e. of mean

Fig 1 Percentage yield loss caused by 100 *S. media* plants/m² on the 12 experiments

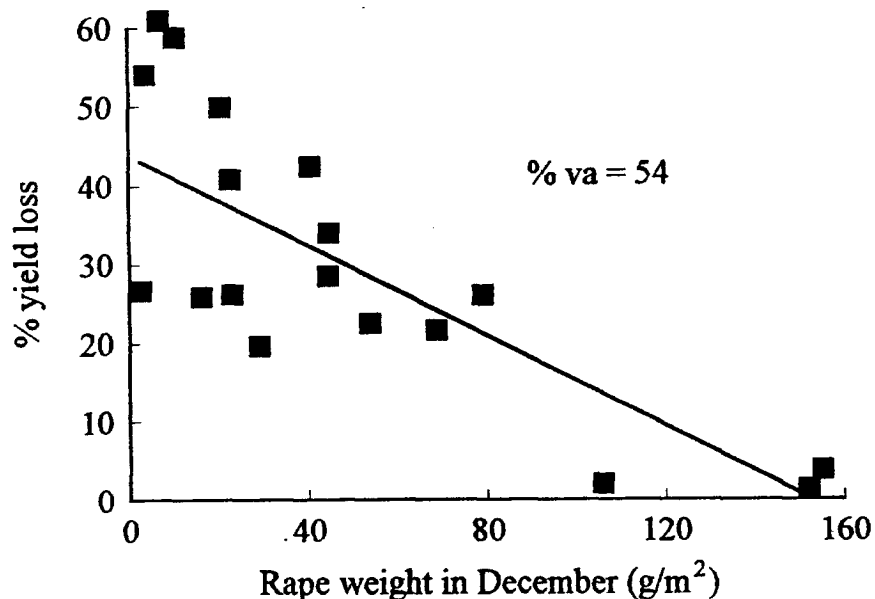


Fig 2 Relationship between rape weight in December and % yield loss caused by 100 *S. media* plants/m².

in the UK. Most must be applied before the end of December, and some key products before the end of October. Until such time as herbicides with more flexible timing are developed for rape, the most practical guidance that can be given, is to attempt to establish a crop that is as vigorous as possible, so that it maximises its competitive ability during the winter. If the weed flora present is susceptible to products that can be applied successfully during the winter, delaying treatment until the end of the year will provide the opportunity to assess the beneficial competitive effects of the crop on future weed damage. However, some form of prophylactic treatment for the control of these weeds may be the only practical approach to their management in many situations.

This programme has been supported by HGCA, MAFF and SOAEFD.

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