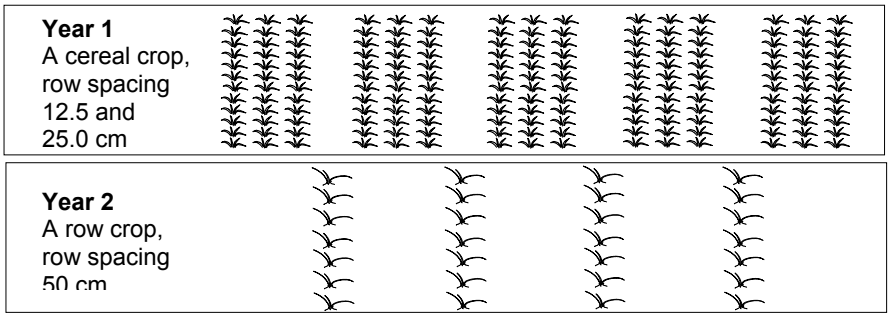
Archived at http://orgprints.org/00001613

11th EWRS (European Weed Research Society) Symposium 1999, Basel

A 2-year cropping system for intra-row weed control in row crops

Bo Melander
Danish Institute of Agricultural Sciences, Department of Crop Protection, Research Centre Flakkebjerg, DK-4200 Slagelse, Denmark

A 2-year cropping system combining non-inversion tillage with a cultivation strategy aiming at reducing the number of annual weeds emerging in a succeeding crop is presented. The system has been developed for controlling annual intra-row weeds in organic row crops and in row crops where no efficient herbicides are available. Thereby time consumption for laborious hand weeding can be lowered. The system is based on an exhaustion of the weed seed bank in the upper 5 cm soil layer obtained by 2-3 times conventional hoeing with goose foot shares in 25 cm wide crop-free bands established in a cereal crop in year 1. Weeds between the crop bands are controlled either by weed harrowing (organic situation) or herbicides (conventional situation) to avoid weed seed shedding from each side of the bands. The following spring, year 2, a row crop is grown in the bands, which means that no inverting soil tillage has taken place between year 1 and 2. Inverting soil tillage would otherwise cause the translocation of new germinable weed seeds to the upper soil layers (Melander, 1996).



A series of four field experiments (without perennial weeds) were conducted from 1994 to 1996 to investigate the effects on annual weeds including other aspects about row crop growing in the absence of inverting soil tillage. No negative effects on yields of seeded onions, beetroot, kale and sugar beets tested in the system were found when comparing to conventional row crop growing with inverting soil tillage. Avoiding soil compaction was very important in that respect. The system was able to reduce intra-row weed numbers by 52 to 77 % as compared to conventional row crop growing. Time consumption for hand weeding was reduced by 35 to 64 %. Physical intra-row weed control by means of flaming and brush weeding could further lower time consumption for hand weeding resulting in an overall time reduction of 78 to 84 %. Generally, the amount of weed seed shedding along the bands in year 1 had a strong influence on the intra-row weed numbers emerging in year 2. Even smaller amounts of weed seeds appeared to counteract the desired effect of the system. Also weed species with mobile seeds, such as *Sonchus arvensis* and *Senecio vulgaris,* could counteract the intended effects of the system by invading the bands during both year 1 and 2.

In conclusion, the 2-year cropping system has shown the potential of reducing intra-row weed numbers in a row crop (year 2) substantially. The prevention of weed seed shedding in the preceding crop (year 1) and the avoidance of soil compaction are decisive for a successful conduction of the system.

List of references cited is available on request