

Simulated insect damage to soybean growing tips

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The growing tip of the main stem of soybeans may be damaged or removed by insects such as the budworm (*Heliothis spp.*) and the grass blue butterfly (*Zizeeria otis labradus*) and by grazing animals such as hares and rabbits. The ability of a soybean crop to recover from decapitation depends on the level and time of damage. An experiment was sown in 1982 and 1983 at Condobolin in central western N.S.W. to measure the ability of the indeterminate soybean variety, Chaffey, to recover from severe levels of decapitation.

Methods

Field plots were subjected to 50% or 100% decapitation by cutting off the top of the main stem (including the unopened leaves) of every alternate or every single plant, respectively, at four times:

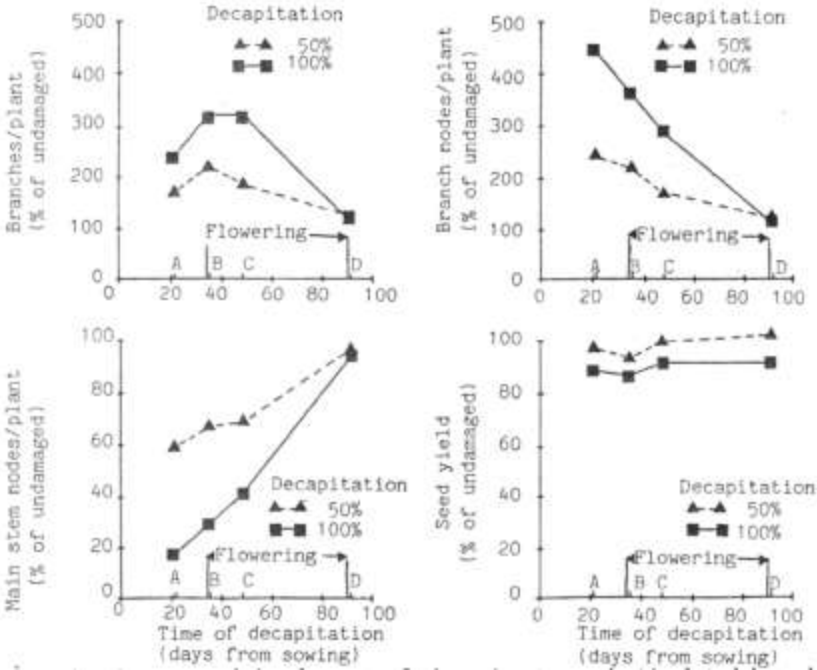
- A - first trifoliolate leaf fully expanded
- B - first flower open
- C - all plants flowering
- D - all plants finished flowering.

Each plot was treated once only and allowed to recover without further damage to simulate single insect attacks. Control plots were left undamaged.

Results and Discussion

Undamaged plots produced 1.6 branches, 9.6 branch nodes and 19.7 main stem nodes per plant and yielded 2762 kg/ha, averaged over the two years.

Decapitation stopped development of the main stem and stimulated branching during the vegetative and flowering phases. The branches compensated for the lack of main stem nodes so that the total number of nodes/plant was maintained, irrespective of the time of treatment. Nevertheless, the disruption to growth had some effect on yield, especially prior to full flowering. Decapitation of all plants caused a 10% reduction in yield.



The ability of indeterminate soybeans to regrow after severe leaf loss during their vegetative and flowering phases is shown in their relative leaf area index at the end of flowering. New leaves were produced on new branches and in the axils of removed leaves. Seed yield and seed size after a 50% defoliation indicate that the final bush size is more than adequate to support the potential yield. Total defoliation prior to or during flowering only reduced yield by 20% but removal of leaves at the end of flowering prevented complete seed set and seed filling and therefore significantly reduced yield.