Root-zone interference between A.repens and winter wheat was studied in solution culture and in soil. The reduction in growth of wheat due to interference was much less in solution culture than in soil. The reduction in growth could be corrected by increasing the nutrient supply in the solution. In soil the reduction in growth increased with time and with increase in age of the A.repens plants. The depression of growth of the wheat could not be corrected by the addition of nutrients to the soil.

Wheat plants with reduced growth due to interference were found to suffer from mineral nutrient deficiencies. Foliar application of mineral nutrients failed to alleviate this condition.

Root growth of the wheat was affected by the presence of A.repens in soil. Using a split-pot technique it was found that the translocation of ^{14}C assimilates to roots growing with A.repens was much less than to roots of the same plant growing in soil not containing A.repens. Wheat plants in split-pots with a section of the root system growing with A.repens and the other section in soil free of A.repens were able to accumulate mineral nutrients but only if these were supplied to the A.repens free soil. $^{14}CO_2$ fed to

A.repens plants was found to be transfered below ground to wheat plants growing in the same pot.

Evidence from these experiments allow the suggestion that A.repens may reduce the growth of wheat by interfering with the synthesis of root-produced growth regulating substances but other hypotheses are also tenable.