

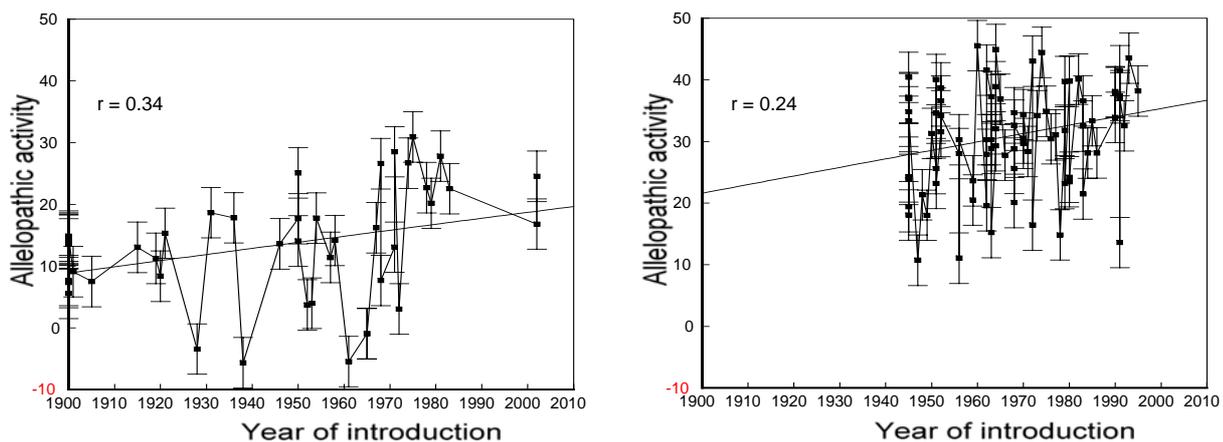
## VARIATION IN ALLELOPATHIC ACTIVITY IN SPRING WHEAT

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An agar-gel bioassay with ryegrass (*Lolium perenne* L.) as receiver plants was used to study the allelopathic activity of 184 spring wheat (*Triticum aestivum* L.) genotypes from Sweden, other European countries and America. During more than 100 years of Swedish spring wheat selection and breeding the allelopathic activity against ryegrass, measured as per cent growth reduction of ryegrass roots, has increased in average from 10 to 22%. The trends are similar in other countries in Europe and North America, but the levels are about 10-15% higher. The trends are opposite to those recently reported in Scandinavian and Baltic spring barley (*Hordeum vulgare* L.), where the activity, measured with the same bioassay, has decreased from about 50% to 40%. The increase and decrease in allelopathic activity in spring wheat and spring barley, respectively, are in parallel to similar changes in thousands grain weights. If the two trends are related or not is not known. If there were a relation the most obvious explanation would be that grain weight and root growth of plants in the bioassay are related, but no such relationship has been found.

The study show that the potential allelopathic activity of Swedish spring wheat is much lower than in spring barley. It is also, in general, lower in germplasms from other countries in Europe and North America. On going studies have also shown that allelopathy together with early vigour are two important breeding traits to improve weed competitive ability in wheat. There is, however, a need to increase the genetic variability in the breeding material. Therefore another 920 genotypes from Africa, South America, Asia and the former Soviet Union were screened with the agar-gel bioassay. A few genotypes were found with an activity around 50-60%, i.e. close to the most allelopathic barley cultivars. Some of these proved to be Triticale lines, but one cultivar from North Africa and two from Japan seem to be pure wheat lines and are now incorporated in the breeding material for increased allelopathic activity in wheat.



Variation in potential allelopathic activity in spring wheat from Sweden (left) and other European countries (right)