

Factsheet Nº 3

Allelopathy in natural ecosystems & its application on agroecology

INTRODUCTION

It is widely accepted that there is a strong need for sustainable weed management strategies that are based on ecological principles. In this context, allelochemicals can be used as natural herbicides (alternatives to synthetic chemical herbicides).

 What is allelopathy and allelochemicals?

Allelochemicals are chemical substances, mainly secondary metabolites (e.g., terpenoids, alkaloids, phenolics, flavonoids), released by some plants, which have a detrimental morphological and physiological effect on other species around them. These compounds can cause severe growth disorders and even lead to complete plant suppression.

AGROECOLOGICAL PRACTICES & ALLELOPATHY

1

Proper crop selection & diversification

Some plants have strong allelopathic capabilities and need no synthetic pesticides and fertilisers. They can be used, for example, as cover crops, intercropping, and hedgerows. Cereals such as *Oryza sativa*, *Triticum aestivum*, and *Hordeum vulgare* are plants with known moderate to strong allelopathic potential. Allelopathic extracts from various plants, like *Sorghum bicolor* and *Helianthus annuus*, have shown promise in reducing the need for synthetic herbicides by up to 50%.

2

Cultural practices for weed suppression

Crop rotation with species that release allelopathic substances can help reduce the presence of weeds. Decomposition of plant residues from allelopathic plants used as mulch can release allelochemical substances into the soil and control the proliferation of weeds.

FIGURE. Cover crop mixture
(cc: Dr. Alexandros Tataridas, University of Coimbra)



KEY TAKEAWAY

Including allelopathy as a natural and ecological management procedure in agroecological practices for weed management can reduce the need for synthetic herbicides. This can be done by growing specific plants or applying allelopathic extracts.

