

**ALLELOPATHIC PRECROP MULCH AS A TOOL OF WEEDS MANAGERMENTS  
IN WINTER WHEAT ORGANIC FARMING****Gawronski S. W.**

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In organic farming, for satisfactory yielding, the major problem to deal with is weeds management, which in case of winter cereals as crops of long vegetation is even more challenging. Sunflower, as based on literature and our earlier studies is good candidate for precrop mulching and it is an objective of complex research carried out in our group including bioassays, physiological, biochemical and field studies. Aims of this 3- year of field studies was/is: (i) test usefulness of sunflower pre - crop mulching for weed control, (ii) evaluate the role of particular factors acting in mulch activity (allelopathic, physical suppression, direct sowing) and (iii) to propose suitable technology for weed managements in organic winter wheat production as the overall goal.

This is the 3<sup>rd</sup> year of field trials conducted in University Farm of WAU with experimental design slightly changed year by year as consequence of obtained results of a former one in order to improve the technology. Last two years experiments consists of the following combinations: a/ control – no mulch, b/ 0 mulch on soil – only roots are left (lack of any physical pressure), c/ 50%, d/ 100% and e/ 200% of mulch left on the soil surface (possible physical pressure of the mulch), f/ flame weeding (eliminating physical barrier and light signals), and g/ black fallow (no physical barrier, different soil bed preparation). Combination of 100% mulch refers to amount of sunflower biomass produced by plants grown on a given plot, left on the ground after cutting and shredding. Sunflower was sown in July (60 kg ha<sup>-1</sup>), and at blooming stage (75-90 days of cultivation) plants were cut off, shredded and layered on the soil surface. Two days later winter wheat “Zyta” was sown by discseeder. Throughout the crop vegetation, weeds density and community, crop stand and grain yield were evaluated.

Sunflower mulch significantly reduced weed infestations and altered weeds community with some species almost completely eliminating though some were almost not affected. Unfortunately crop density was also reduced by sunflower mulch especially in 2002/03 when it coincided with very unfavourable temperature and soil moisture conditions. Yield, in first year, exceeded control by 30 % but in the 2<sup>nd</sup> was lower (also by ~30%). Additionally, some crop plants showed nitrogen deficiency. These studies unravel some disadvantages of using sunflower mulch, overcoming of which is evaluated by: (i) using sunflower mulch in mixture with legumes leading to increased nitrogen level (ii) increased sowing rate up to 550 seeds x m<sup>-2</sup> and (iii) by earlier than recommended sowing term. Summing up sunflower in mixture with legumes seems to be promising alternative strategy for weed management in organic farming.