Comparison among different available strategies for weed control in maize

Weed competition can cause severe yield reduction in maize cultivation. Since the sixties the large availability of different herbicides has allowed maize growers to reach appreciable increase in the yield per hectare. At present different strategies based both on chemical and mechanical control can be adopted to control weed infestation.

**OBJECTIVES**

The aim of the study was to compare different weed control strategies currently available in terms of type (chemical, mechanical or a combination of both) that fulfill the requirements of the Directive 2009/128/EC.

**MATERIALS AND METHODS**

The study was conducted in 2014 at Turano Lodigiano, in the Lombardy Region (Italy) on a field of about 6000 m², with 90 plots of 28 m² each. Plots were completely randomized with three replications for each control strategy. Five weed control strategies were compared: PRE-EMERGENCE, POST-EMERGENCE, PRE + POST-EMERGENCE, CHEMICAL (PRE OR POST) + MECHANICAL, MECHANICAL ALONE.

### WEED CONTROL STRATEGIES COMPARED

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Description</th>
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<tbody>
<tr>
<td>1) CONTROL (absence of weed control)</td>
<td>No weed control applied</td>
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<tr>
<td>2) PRE-EMERGENCE followed by POST-EMERGENCE</td>
<td>Weed control applied at the seedling stage followed by a POST-EMERGENCE application</td>
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<tr>
<td>3) CHEMICAL</td>
<td>Herbicide application</td>
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<tr>
<td>CHEMICAL FOLLOWED BY MECHANICAL</td>
<td>Herbicide application followed by mechanical weed control</td>
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### RESULTS

- **Overall herbicide efficacy (%) measured at 73 days from sowing in the 5 weed control strategies compared**

**Main Weed Species**

- *Abutilon theophrasti*, *Amaranthus retroflexus*, *Chenopodium album*, *Echinochloa crus-galli*, *Panicum dichotomiflorum*, *Poa annua*, *Portulaca oleracea*, *Setaria viridis*, *Solanum nigrum*

**Grain Yield**

18.5 t/ha without significant differences between strategies, with the only exception of CONTROL plots (0.53 t/ha) and MECHANICAL plots (3.67 t/ha)

### CONCLUSIONS

OVERALL THE CHEMICAL CONTROL SHOWED A HIGH EFFICACY TOWARDS MOST OF THE WEEDS. THE LACK OF EFFICACY SEEN FOR MECHANICAL STRATEGIES WAS MAINLY DUE TO THE INCOMPLETE ACTION OF THE SPRING-TOOTH HARROWING INTERVENTION WHICH LET MANY UNDISTURBED WEEDS ON THE CROP ROW