Performance of Boro rice to weeding regimes and crop residues under strip tillage system

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Introduction
One disadvantage of conservation tillage is increase in weed pressure (Hossain et al, 2014). Weed control in conservation tillage is dependent on the use of herbicides, but other cultural options may help in reducing weed infestations. There is limited knowledge about effective weed control under conservation tillage in intensive rice based cropping systems in Bangladesh. The objectives of this study were to examine the effect of herbicides and hand weeding with or without residues on weed control in rice

Materials and Methods
Boro (winter) rice cv. BRRI Dhan28 was transplanted on 14 February 2014 in Gouripur, Mymensingh, Bangladesh using the following treatments-

I. Tillage and weed control practices
C: Conventional tillage (CT) + three hand weeding (HW) (Control)
Gly+ST: Glyphosate + Strip tillage + one HW
Gly+ST+PE: Gly+ ST+ Pre-emergence (PE) herbicide (pendimethalin)
Gly+ST+PO: Gly+ST+ Post-emergence (PO) herbicide (ethoxysulfurun)
Gly+ST+PE+PO
Gly+ST+ weed-free (WF) (6 hand weeding)

II. Crop residues
R0: No residue
R50: High residue (50% by height).

The experiment was laid out in RCBD with 4 replications. Dry weed biomass was recorded at 40 days after transplanting (DAT) and grain yield at harvest. Benefit cost ratio (BCR) was calculated for each treatment.

Results and discussions
ST reduced weed biomass by 53% and increased rice yield by 9% and BCR by 16% compared to CT regardless of herbicides and residues. Higher residues significantly reduced weed biomass by 20% and increased rice yield by 4% and BCR by 9% (Table 1). Application of Glyphosate at pre-sowing in ST reduced weed biomass by 10% at 40 DAT compared to CT. Application of Glyphosate followed by a pre-emergence and a post-emergence herbicide with
residues in ST reduced weed biomass by 73% leading to 20% increase in grain yield and 48% in BCR compared to Roundup alone without residues (Table 1).

**Conclusion**
Strip tillage and residue retention reduced weed biomass and increased grain yield and BCR. Application of Roundup followed by one pre-emergence and one post-emergence herbicide with residues reduced weed biomass compared to Roundup alone and increase rice yield and BCR in strip tillage. Farmers are likely to increase productivity and profit from strip tillage and residue retention in rice crop, by suppressing weeds.

**Acknowledgement**
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**References**

**Table 1.** Effect of tillage and weed control practice and residues on weed dry matter, grain yield and BCR of *Boro* rice

<table>
<thead>
<tr>
<th>Treatments</th>
<th>Weed biomass (gm⁻²) at 40 DAT</th>
<th>Yield (t ha⁻¹)</th>
<th>BCR</th>
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<tbody>
<tr>
<td>CT+2 HW+R₀</td>
<td>58a</td>
<td>5.17gh</td>
<td>1.63g</td>
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<tr>
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<td>50b</td>
<td>5.20g</td>
<td>1.76g</td>
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<td>5.18g</td>
<td>2.15f</td>
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<td>5.27f</td>
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<td>5.41e</td>
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<td>3.10c</td>
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<td>LSD (0.05)</td>
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<td>0.32</td>
<td>0.18</td>
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