The impact of covering plants with weeds species on the prior plant and production to the winter wheat crop

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Abstract  The research was conducted in 2008-2009 and followed the influence of six plants run on the cover of plants with weeds plants culture and production of winter wheat. Predominant weeds were Veronica hederifolia, Viola arvensis, Polygonum Convolvulus, Convolvulus arvensis and Stellaria media. The degree of reduction of weeds, depending on pre-plant fluctuated between 17.84 and 28%, 43% in 2008 and between 20.49% and 29.58% in 2009. Production is directly proportional to the absolute level of covering plants with weeds plants, beings from 38.05 q / ha and 43.26 q / ha in 2008 and between 44.72 q / ha and 52.08 q / ha in 2009.

Key words  rotation, revolution, culture, degree of covering plants with weeds plants production

Crop rotation is considered the oldest method Agricultural Sciences since primitive times, having an important role in crop production. Of particular importance is the manner in which a crop rotation is grown crops, such predecessor, then placed each culture. Currently the main crop rotation is considered pivotal sustainable agriculture. The effects are even more effective if planning does not require additional investment in crop rotations (2). Weeds are one of the limiting factors of agricultural production, regardless of culture. Depending on the structure and number of sole crops, it provides a small percentage of covering plants with weeds plants (1, 3).

Materials and Methods  Conducted research aimed at understanding the influence of crop rotation on culture of covering plants with weeds species and production of winter wheat. It has grown variety of wheat Alex. Alex variety was approved in 1994 Lovrin Research Station. It is a sort of twinning capacity earlier high. It is resistant to winter, medium brown rust and powdery mildew disease resistant, rust resistant and medium yellow. Has a genetic potential to 7000-8000 kg / ha (4).

Soil that were placed experience is a mold, poor glazed, low decarbonizes on medium-fine loess deposits. Experiences were placed by the method subdivided parcels, with six variants in four repetitions (5).

The research was made in Timișoara Station Teaching in 2008-2009 and followed the influence of pre-six plants (soybean, winter wheat, sunflower, barley, winter, spring maize and oats) on cover plants with weeds plants and production to winter wheat crop. Basic work of the soil, namely plowing after harvesting was performed prior to each plant. The germination bed preparation was performed by two passes with the disc harrow. Was fertilized with N45P45K45 autumn and in spring were applied 67kg/ha nitrogen etc. Herbicide was done with Lintur 150g/ha.

Results obtained  Researches focused on determining the number of weed species, depending on the plant prior to emphasize consistency, abundance and significance index, with direct involvement in the production of winter wheat. In 2008, buruieni/m2 number was 91.90. Monocotyledonous plants are 2.02%, while dicotyledonous plants are 97.98%. Highest number of annual weeds is owned dicotiledonated plants hold 88, 68%, while only 9 dicotiledonated perinea plants hold 30%.

Weeds are the most common: Veronica hederifolia (22.59%), Viola arvensis (19.93%), Stellaria media (13.14%), Polygonum Convolvulus (9.83%), and Convolvulus arvensis (7.88%), (Table 1).

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Table 1

Floristic composition of weeds in monoculture of winter wheat in 2008

<table>
<thead>
<tr>
<th>Nr.crt.</th>
<th>Weed species</th>
<th>Number of weeds /m²</th>
<th>% of participation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Veronica hederifolia</td>
<td>20,76</td>
<td>22,59+</td>
</tr>
<tr>
<td>2.</td>
<td>Viola arvensis</td>
<td>18,32</td>
<td>19,93</td>
</tr>
<tr>
<td>3.</td>
<td>Stellaria media</td>
<td>12,08</td>
<td>13,14</td>
</tr>
<tr>
<td>4.</td>
<td>Polygonum convolvulus</td>
<td>9,03</td>
<td>9,83+</td>
</tr>
<tr>
<td>5.</td>
<td>Convolvulus arvensis</td>
<td>7,24</td>
<td>7,88+</td>
</tr>
<tr>
<td>6.</td>
<td>Sinapis arvensis</td>
<td>6,17</td>
<td>6,71+</td>
</tr>
<tr>
<td>7.</td>
<td>Fumaria officinalis</td>
<td>4,95</td>
<td>5,39+</td>
</tr>
<tr>
<td>8.</td>
<td>Senecio vulgaris</td>
<td>3,60</td>
<td>3,92+</td>
</tr>
<tr>
<td>9.</td>
<td>Capsella bursa pastoris</td>
<td>3,34</td>
<td>3,63</td>
</tr>
<tr>
<td>10.</td>
<td>Consolida regalis</td>
<td>2,18</td>
<td>2,37</td>
</tr>
<tr>
<td>11.</td>
<td>Sorghum halepense</td>
<td>1,85</td>
<td>2,02+</td>
</tr>
<tr>
<td>12.</td>
<td>Cirsium arvense</td>
<td>1,30</td>
<td>1,42+</td>
</tr>
<tr>
<td>13.</td>
<td>Chenopodium album</td>
<td>0,72</td>
<td>0,78</td>
</tr>
<tr>
<td>14.</td>
<td>Amaranthus retroflexus</td>
<td>0,24</td>
<td>0,26</td>
</tr>
<tr>
<td>15.</td>
<td>Galium aparine</td>
<td>0,08</td>
<td>0,09</td>
</tr>
<tr>
<td>16.</td>
<td>Xanthium strumarium</td>
<td>0,04</td>
<td>0,04</td>
</tr>
<tr>
<td></td>
<td>TOTAL(weeds/m²)</td>
<td>91,90</td>
<td>100,00</td>
</tr>
</tbody>
</table>

Number is different depending on the weed plant run. Lowest number of weeds was recorded in the variant where soybean plant run was only 65,78 weed species/m². After hoeing is an increase in the number of weeds, being 67,95 weed species/m² and 70,60 species/m² when the plant was pre-crop maize. Culture with the highest percentage reduction of the degree of covering plants with weeds plants is soy, 28,43%, closely followed by culture with 67 sunflowers, 26,07% (Table 2).

Table 2

Pre-plant influence on covering plants with weed species of the winter wheat crop in 2008

<table>
<thead>
<tr>
<th>Variant (pre-plant)</th>
<th>Number of weeds/m² according to pre-plant</th>
<th>% of control weeds according to pre-plant</th>
<th>Number of weeds/m² noncombatant depending on technology used</th>
<th>% weed reduction depending on the technology used</th>
</tr>
</thead>
<tbody>
<tr>
<td>V₂ - Winter wheat (monoculture)</td>
<td>91,90</td>
<td>0,00</td>
<td>36,42</td>
<td>60,37</td>
</tr>
<tr>
<td>V₃ - Winter barley</td>
<td>75,51</td>
<td>17,84</td>
<td>25,51</td>
<td>72,25</td>
</tr>
<tr>
<td>V₄ - Spring oats</td>
<td>74,39</td>
<td>19,06</td>
<td>24,46</td>
<td>73,39</td>
</tr>
<tr>
<td>V₅ - Grain maize</td>
<td>70,60</td>
<td>23,18</td>
<td>20,08</td>
<td>78,16</td>
</tr>
<tr>
<td>V₆ - Sunflower</td>
<td>67,95</td>
<td>26,07</td>
<td>19,27</td>
<td>79,04</td>
</tr>
<tr>
<td>V₇ - Soy</td>
<td>65,78</td>
<td>28,43</td>
<td>15,74</td>
<td>82,88</td>
</tr>
</tbody>
</table>
Depending on the technology applied to vegetation during the winter wheat crop, weed control percentage is between 60 and 37% of those 82.88%. The most effective weed control is done after soybean and sunflower, 82 percent were against, 88% and 79.04%. In monoculture, the percentage of weed control was 60.37% (Table 2).

Monoculture wheat production was 35.12 quintals per hectare. The highest increases production, compared to monoculture soybean is conducted and sunflowers, which are of 8.14 q/ha and 6, 85q/ha. Production increases achieved by spring oats and winter barley are much lower, 3.82 q/ha and those of 2, 93q/ha. Relative output ranges from 108,34% (after winter barley) and 123.17% (after soybean) (Table 3).

### Table 3

<table>
<thead>
<tr>
<th>Variant (pre-plant)</th>
<th>Absolute production (q/ha)</th>
<th>Relative production (%)</th>
<th>Output gap (q/ha)</th>
<th>Significance of difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>V1-Soy</td>
<td>43,26</td>
<td>123.17</td>
<td>8,14</td>
<td>xxx</td>
</tr>
<tr>
<td>V3-Sunflower</td>
<td>41,97</td>
<td>119.50</td>
<td>6,85</td>
<td>xxx</td>
</tr>
<tr>
<td>V5-Grain maize</td>
<td>41,38</td>
<td>117.82</td>
<td>6,26</td>
<td>xx</td>
</tr>
<tr>
<td>V6-Spring oats</td>
<td>38,94</td>
<td>110.87</td>
<td>3,82</td>
<td>x</td>
</tr>
<tr>
<td>V4-Winter barley</td>
<td>38,05</td>
<td>108.34</td>
<td>2,93</td>
<td>-</td>
</tr>
<tr>
<td>V2-Winter wheat (monoculture)</td>
<td>35,12</td>
<td>100.00</td>
<td>Mt.</td>
<td>-</td>
</tr>
</tbody>
</table>

In 2009 the number of weeds in monoculture of winter wheat was only 77,47 /m², thanks to lower quantities of precipitation fell in April. Analyzing the floristic composition of weed species in monoculture of winter wheat are found monocotyledonous weeds are 2,50, while 97 dicotyledonous plants is 50%. If we look at dicotyledonous plants, it appears that annual is 80,59%, while perennial hold only 16,91%.

Predominant weed species are: Veronica hederifolia (20, 98%), Viola arvensis (19.93%), Polygonum Convolvulus (15.97%), and Convolvulus arvensis (11.28%) (Table 4). Highest degree of control it provides soybean crop, with 29 percent against, 58%. Plants hoes, corn and sunflower provide cover plants with weeds plants reduction degree of 24,38% and 27,25%. Winter barley ensures worst weed control 20,49%.

Following implementation of specific technology of winter wheat crop, weed percentage reduction ranges from 71,26% and 90,41% (Table 5). Production of winter wheat produced in 2009 is higher than that achieved in 2008. In monoculture production is performed at 42,05kg/ha. Highest production of 52,08kg/ha was done after soybean. Production increases as sunflower and soybean, compared with monoculture are 10,03q/ha and 7,31q/ha very significant (Table 6).
### Table 4

Floristic composition of weeds in monoculture of winter wheat in 2009

<table>
<thead>
<tr>
<th>Nr.crt.</th>
<th>Weed species</th>
<th>Number of weeds /m²</th>
<th>% of participation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Veronica hederifolia</td>
<td>16,25</td>
<td>20,98</td>
</tr>
<tr>
<td>2.</td>
<td>Polygonum convolvulus</td>
<td>12,37</td>
<td>15,97</td>
</tr>
<tr>
<td>3.</td>
<td>Stellaria media</td>
<td>9,63</td>
<td>12,43</td>
</tr>
<tr>
<td>4.</td>
<td>Convolvulus arvensis</td>
<td>8,74</td>
<td>11,28</td>
</tr>
<tr>
<td>5.</td>
<td>Chenopodium album</td>
<td>7,32</td>
<td>9,45</td>
</tr>
<tr>
<td>6.</td>
<td>Atriplex patula</td>
<td>5,08</td>
<td>6,56</td>
</tr>
<tr>
<td>7.</td>
<td>Amaranthus retroflexus</td>
<td>4,97</td>
<td>6,42</td>
</tr>
<tr>
<td>8.</td>
<td>Cirsium arvense</td>
<td>4,36</td>
<td>5,63</td>
</tr>
<tr>
<td>9.</td>
<td>Viola arvensis</td>
<td>2,25</td>
<td>2,90</td>
</tr>
<tr>
<td>10.</td>
<td>Sinapis arvensis</td>
<td>2,01</td>
<td>2,59</td>
</tr>
<tr>
<td>11.</td>
<td>Sorghum halepense</td>
<td>1,94</td>
<td>2,50</td>
</tr>
<tr>
<td>12.</td>
<td>Capsella bursa pastoris</td>
<td>1,32</td>
<td>1,70</td>
</tr>
<tr>
<td>13.</td>
<td>Fumaria officinalis</td>
<td>0,62</td>
<td>0,80</td>
</tr>
<tr>
<td>14.</td>
<td>Galium aparine</td>
<td>0,36</td>
<td>0,47</td>
</tr>
<tr>
<td>15.</td>
<td>Xanthium strumarium</td>
<td>0,25</td>
<td>0,32</td>
</tr>
<tr>
<td></td>
<td>TOTAL(weeds/m²)</td>
<td>77,47</td>
<td>100,00</td>
</tr>
</tbody>
</table>

### Table 5

Pre-plant influence on covering plants with weed species of the winter wheat crop in 2009

<table>
<thead>
<tr>
<th>Variant (pre-plant)</th>
<th>Number of weeds/m² according to pre-plant</th>
<th>% of control weeds according to pre-plant</th>
<th>Number of weeds /m² noncombatant depending on technology used</th>
<th>% weed reduction depending on the technology used</th>
</tr>
</thead>
<tbody>
<tr>
<td>V₁- Soy</td>
<td>54,56</td>
<td>29,58</td>
<td>7,43</td>
<td>90,41</td>
</tr>
<tr>
<td>V₃-Sunflower</td>
<td>56,36</td>
<td>27,25</td>
<td>9,86</td>
<td>87,28</td>
</tr>
<tr>
<td>V₅-Spring Oats</td>
<td>58,59</td>
<td>24,38</td>
<td>11,25</td>
<td>85,48</td>
</tr>
<tr>
<td>V₆-Winter barley</td>
<td>60,79</td>
<td>21,54</td>
<td>14,50</td>
<td>81,29</td>
</tr>
<tr>
<td>V₄-Winter barley</td>
<td>61,60</td>
<td>20,49</td>
<td>15,16</td>
<td>80,44</td>
</tr>
<tr>
<td>V₂- Winter wheat</td>
<td>77,47</td>
<td>0,00</td>
<td>22,27</td>
<td>71,26</td>
</tr>
</tbody>
</table>
Table 6

Pre-plant influence on winter wheat production in 2009

<table>
<thead>
<tr>
<th>Variant (pre-plant)</th>
<th>Absolute production (q/ha)</th>
<th>Relative production (%)</th>
<th>Output gap (q/ha)</th>
<th>Significance of difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>$V_1$-Soy</td>
<td>52.08</td>
<td>123.85</td>
<td>10.03</td>
<td>xxx</td>
</tr>
<tr>
<td>$V_3$-Sunflower</td>
<td>49.36</td>
<td>117.38</td>
<td>7.31</td>
<td>xxx</td>
</tr>
<tr>
<td>$V_5$-Grain maize</td>
<td>48.03</td>
<td>114.22</td>
<td>5.98</td>
<td>xx</td>
</tr>
<tr>
<td>$V_6$-Spring oats</td>
<td>45.24</td>
<td>107.58</td>
<td>3.19</td>
<td>-</td>
</tr>
<tr>
<td>$V_4$-Winter barley</td>
<td>44.72</td>
<td>106.34</td>
<td>2.67</td>
<td>-</td>
</tr>
<tr>
<td>$V_2$- Winter wheat (monoculture)</td>
<td>42.05</td>
<td>100.00</td>
<td>Mt.</td>
<td>-</td>
</tr>
</tbody>
</table>

Conclusions

Following research on two years of research were the following conclusions:
1. As to climate two years have been favorable winter wheat crop.
2. Pre-plant currently turns and technological link with maximum effectiveness both on covering the plants with weed species and on production.
3. Predominant weeds were Veronica hederifolia, Viola arvensis, Polygonum Convolvulus and Stellaria media.
4. The degree of weed control depending on the plant run is between 17.84 and 28.43% in 2008, and between 20.49 and 29.58% in 2009.
5. After implementing all the measures to combat weeds, the degree of control varies between 60.37% and 82.88% in 2008 and between 71.26% and 90.41% in 2009.
6. In monoculture winter wheat production in 2008 was 35.12 q / ha and in 2009 was 42.05 quintals per hectare.

References