Title: Is re-planted rice protected from rice water weevil by an initial planting of Icon 6.2FS - treated rice in a drill-seeded, delayed flood regime? Beaumont, TX. 2000. Study Number USA00W10.

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Introduction

Every year some unfortunate rice farmers re-plant due to thin stands caused by blackbirds, geese, diseases, cool or inclement weather, planting too deep, poor seedbed, etc. The objective of this experiment was to determine if an initial planting of Icon 6.2FS - treated rice protected re-planted, untreated rice from rice water weevil (RWW) in a drill-seeded, delayed flood regime.

Materials and Methods

The experiment was conducted in 2000 at the TAMU Agricultural Research and Extension Center at Beaumont. The experiment was designed as a randomized complete block with eight treatments (see Table 1 for treatment descriptions) and four replications. Each plot was 20 ft x 4 ft surrounded by a metal barrier to prevent movement of insecticide and fertilizer. On 30 Mar, designated plots were drill-seeded (seven rows, 7 inches between rows) into a tilled seedbed at 90 lb seed/acre with selected seed as described in Table 1. Some plots were left unplanted. The variety was Cocodrie. Icon 6.2FS - treated seed was prepared using the ‘Le Sak’ method. Icon 6.2FS was applied to seed at 0.037 lb (AI)/acre given a 90 lb/acre seeding rate. On the same day plots were seeded, urea was applied to planted plots at 56.7 lb N/acre. After application of urea, plots were flushed (temporary flood for 48 hours followed by drain). On 9 Apr, rice emerged through League soil. On 22 Apr, all plots were sprayed with Roundup Ultra at 2 qt/acre. Roundup Ultra was applied with a hand-held, 3 nozzle spray rig. From rice emergence to application of Roundup Ultra, plots were flushed as needed. On 27 Apr, selected plots were tilled with a garden rototiller. Depth of cultivation was about 3 to 4 inches. On 28 Apr, selected plots were re-planted and remaining plots were planted for the first time. All plots were drill-seeded with Cocodrie at 90 lb/acre. Thus, before planting on 28 Apr, selected plots were tilled and remaining plots were in a stale seedbed condition. Again, selected plots were planted with seed treated with Icon 6.2FS at 0.037 lb (AI)/acre given a 90 lb/acre seeding rate. As before, Icon 6.2FS was applied to seed using the ‘Le Sak’ method. In addition, barriers were removed before tilling and replaced following planting on 28 Apr. After replacing barriers, urea was applied to plots at 56.7 lb N/acre and plots were flushed. Rice emerged 6 May. From emergence of rice through soil to application of the permanent flood on 26 May (20 days after emergence of rice through soil), plots were flushed as needed. On 19 May, plots were sprayed...
with Arrosolo 3-3E at 2 qt/acre, Basagran at 1.5 pt/acre, Facet 75DF at 0.5 lb/acre and AgriDex at 1 pt/acre. Herbicides were applied by hand using a two person spray rig. Immediately before application of the permanent flood, urea was applied to plots at 56.7 lb N/acre. On 18 and 28 Jun (23 and 33 days after application of the permanent flood), five, 4 inch diam. x 4 inch deep soil cores (each core contained at least one rice plant) were removed from each plot. Cores were washed and immature RWW recovered from the roots and counted. On 19 Jun and 11 Jul, urea was applied to plots at 56.7 and 30 lb N/acre, respectively. Thus, rice planted 28 Apr received a total of 200 lb N/acre for the entire growing season. On 25 Aug (111 days after emergence of rice through soil), plots were harvested with a small plot combine. Yields were adjusted to 12% moisture. RWW count data were transformed using $x^{0.5}$ and all data analyzed by ANOVA and DMRT.

Results

At the time of re-planting, relatively little organic matter was observed in the plots. Very few weeds were present at the time of Roundup Ultra application so the majority of dead organic matter at the time of re-plant tillage was rice roots below ground and rice foliage above ground. Populations of immature RWW were significantly higher in the untreated tilled than the untreated stale seedbed plots on the first sample date (Table 1). In fact, populations were 60% higher in the tilled plots. Perhaps tilled soil provided better conditions for survival of immature RWW compared to soil in a stale seedbed. First-planted Icon 6.2FS - treated seed protected re-plant untreated seed under both tillage conditions. However, control was better in the tilled (95%) than in the stale seedbed (72%). More undecomposed organic matter may have been present in the stale seedbed plots and perhaps this partially inactivated the insecticide compared to the tilled plots. Also, control on the first sample date in stale seedbed plots was significantly better when Icon 6.2FS was applied to seed on both plantings versus a single planting on 30 Mar. On the second sample date, Icon 6.2FS - treated re-plant seed protected untreated first-plant seed, regardless of tillage. Icon 6.2FS applied only once on seed planted 28 Apr provided similar control to Icon 6.2FS applied twice on seed planted 30 Mar and 28 Apr.

Yields were similar under both tillage conditions (Table 1). However, protection of re-plant, untreated seed by first-plant, Icon 6.2FS - treated seed was reflected in significant yield increases - 800 and 722 lb/acre under stale seedbed and tilled conditions, respectively. Highest yields were produced in plots planted both times with Icon 6.2FS - treated seed - 1597 and 1822 lb/acre more than plots planted both times with untreated seed under stale seedbed and tilled conditions, respectively. Two applications of Icon 6.2FS produced much higher yields than a single application at the first planting - 797 and 1100 lb/acre more under stale seedbed and tilled conditions, respectively. This is unexpected given the relatively small differences in RWW control. These results suggest that pest organisms other than RWW are affected by Icon 6.2FS. Finally, although treating first-plant seed with Icon 6.2FS protects untreated, re-plant rice from RWW, treating both first and re-plant seed may produce yields high enough to justify the cost of the re-plant seed treatment.
Is re-planted rice protected from rice water weevil by an initial planting with Icon 6.2FS (drill-seeded)

<table>
<thead>
<tr>
<th>30 Mar planting</th>
<th>28 Apr planting</th>
<th>Tillage before re-plant</th>
<th>18 Jun</th>
<th>28 Jun</th>
<th>( \chi^2 ) no. immature RWW/5 cores</th>
<th>( \chi^2 ) yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>Untreated</td>
<td>Untreated</td>
<td>Stale seedbed</td>
<td>61.5 b</td>
<td>27.5 a</td>
<td>7644 de</td>
<td></td>
</tr>
<tr>
<td>Icon 6.2FS(^1)</td>
<td>Untreated</td>
<td>Stale seedbed</td>
<td>17.5 c</td>
<td>4.3 b</td>
<td>8444 bc</td>
<td></td>
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<tr>
<td>Icon 6.2FS(^1)</td>
<td>Icon 6.2FS(^1)</td>
<td>Stale seedbed</td>
<td>2.3 d</td>
<td>4.8 b</td>
<td>9241 a</td>
<td></td>
</tr>
<tr>
<td>-</td>
<td>Icon 6.2FS(^1)</td>
<td>Stale seedbed</td>
<td>8.5 cd</td>
<td>5.5 b</td>
<td>8931 ab</td>
<td></td>
</tr>
<tr>
<td>Untreated</td>
<td>Untreated</td>
<td>Tilled</td>
<td>98.3 a</td>
<td>23.5 a</td>
<td>7453 e</td>
<td></td>
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<tr>
<td>Icon 6.2FS(^1)</td>
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<td>Tilled</td>
<td>4.5 d</td>
<td>4.3 b</td>
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<td>2.8 b</td>
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<tr>
<td>-</td>
<td>Icon 6.2FS(^1)</td>
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<td>9.3 cd</td>
<td>6.3 b</td>
<td>8926 ab</td>
<td></td>
</tr>
</tbody>
</table>

\(^1\)Applied to seed at 0.037 lb (AI)/acre given a 90 lb/acre seeding rate
\(^2\)Means in a column followed by the same or no letter are not significantly different at the 5% level (ANOVA, DMRT).