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“Solidarity in a competing world —
fair use of resources”

Rice Affected by Seed Treatment, Soil Compaction and Nitrogen at No-Tillage and Conventional Tillage

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Abstract

Rice is included in the diet of half of the world's population. Mostly of this cereal is grown on irrigated land. However, available water for growing irrigated rice by flood irrigation has been reduced because of the competing demands of industry and population. As a result, we are looking for alternatives that allow greater efficiency of water use. Some alternatives include growing rice under upland conditions, such as at a no-tillage system (NTS). The objective of this study was to determine the best combination of management options for upland rice production: seed treatment, N management and soil compaction in zero and conventional tillage methods. We conducted two field trials, one in NTS and another at conventional tillage (CT) (one plowing and two disking). For each trial, experimental design was a randomised block design in a factorial scheme. The treatments consisted of a combination of five rice cultivar (BRS Caçula, BRS Serra Dourada, BRS Primavera, BRS Sertaneja, and BRS Esmeralda) with two compaction pressures on the sowing furrow (25 kPa or 126 kPa), two types of seed treatment (with or without pesticide) and two types of N management (all amount of N at sowing or all amount of N at topdressing). Application of N at sowing instead of at topdressing was effective to allow higher grain yield at NTS. Under this system, upland rice genotypes had higher grain yield with higher compaction pressure. Seed treatment with pesticide provided higher grain yield for BRS Sertaneja at NTS, and for all genotypes at CT. BRS Esmeralda at NTS, and BRS Esmeralda and BRS Primavera at CT, were the most productive genotypes. Our results show that it is possible to produce upland rice under NTS, however the farmers should pay attention to some factors, such as the genotype more adapted for this condition, application timing of N, and compaction pressure on the sowing furrow. At CT, seed treatment is an important practice to improve upland rice grain yield.

Keywords: Aerobic rice, early N fertilisation, fipronil, pesticide, termite