### Supplementary tables

**Table S1:** Data Statistics of sequencing results for soil samples collected from sugarcane monoculture and sugarcane legume (peanut and soybean) intercropped fields in Guangxi, China

<table>
<thead>
<tr>
<th>Sample name</th>
<th>Reads (bp)</th>
<th>Raw data (Mbp)</th>
<th>Adapter (%)</th>
<th>N base (%)</th>
<th>Poly base (%)</th>
<th>Low quality</th>
<th>Clean data (Mbp)</th>
<th>Data utilization ratio (%)</th>
<th>Raw reads</th>
<th>Denoised reads</th>
<th>Clean reads</th>
<th>Read utilization ratio (%)</th>
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Table S2: Tags, OTUs and alpha diversity statistics for soil samples collected from sugarcane monoculture and sugarcane legume (peanut and soybean) intercropped fields in Guangxi, China

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<th>Connect ratio (%)</th>
<th>Average length/SD</th>
<th>Tag number</th>
<th>OTUs/observed species</th>
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<th>Ace</th>
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Figure S1: Rank curves of Operational Taxonomic Units (OTUs) of diazotrophs in soil samples from the four locations.
Figure S2: Principal component analysis of Operational Taxonomic Units (OTUs) of diazotrophs in four different locations of Guangxi, China. Shape of symbol represents different cultivation systems, sugarcane monoculture (M-triangles), peanut-sugarcane intercropping (P-filled circles) and soybean-sugarcane intercropping (S-empty circles)
Figure S3: Average Rarefaction curves of alpha diversity index of diazotrophs in soil samples; M-sugarcane monoculture (n=5), P-peanut-sugarcane intercropping (n=3) and S-soybean-sugarcane intercropping (n=3)
Figure S4: Beta diversity heatmap derived from dissimilarity matrix of weighted UniFrac, Unweighted UniFrac and Bray Curtis distance between diazotrophs among three cultivation systems samples in four different locations of Guangxi, China, M-sugarcane monoculture (n=5), P-peanut-sugarcane intercropping (n=3) and S-soybean-sugarcane intercropping (n=3)
Figure S5: Relative distribution of diazotrophs at genes levels among the soil samples from three cultivation systems in four different locations of Guangxi, China; sugarcane monoculture (M), peanut intercropping (P) and soybean intercropping (S)