

**E-24. Carbon footprint of pre-sprouted sugarcane seedling produced in the central-south region of Brazil**

Ana Paula Coelho Sampaio<sup>1</sup>; Nilza Patrícia Ramos<sup>1</sup>; Marília Ieda Da Silveira Folegatti<sup>1</sup>; Mauro A. Xavier<sup>2</sup>; Anna Leticia Montenegro Turtelli Pighinelli<sup>1</sup>. <sup>1</sup>Embrapa Meio Ambiente, SP, Brasil; <sup>2</sup>Instituto Agronômico (IAC), Campinas, SP, Brasil.

The production of sugarcane pre-sprouted seedlings (PSS) has expanded over the last 10 years, primarily to enhance genetic and health benefits in planting areas. The present study aimed to quantify the carbon footprint (CF) of typical sugarcane PSS, adopted in the Brazilian Center-South region, using Life Cycle Assessment (LCA) methodology. The ISO 14040 and 14067 protocols were used, excluding Land Use Change (nursery area). The reference unit was 1 (one) PSS produced and delivered to sugarcane grower. Primary data were collected from seven nurseries of PSS, which represent 37% of Center-South production, using questionnaire/interview methodology. Emissions were calculated using ICVCalc toll, with IPCC protocol for greenhouse gases (GHG), linked to ecoinvent 3.9.1 database and CF generated by Simapro software expressed in terms of CO<sub>2</sub>-equivalent/PSS. The results indicated that sugarcane PSS production involves five stages: 1) receiving and preparing the buds; 2) sprouting; 3) acclimatization; 4) rustification and 5) transport; each stage with specific inputs consumptions and emissions. Emissions were 1.5 g CO<sub>2</sub>-eq/PSS from production in nursery and transport, and 21.7 g CO<sub>2</sub>-eq/PSS from the production/extraction of inputs used in the system (background). The extraction of the substrate was the largest contributor to background emissions, followed by the materials for plastic trays and fertilizers. Nurseries can reduce PSS emissions by changing input sources, with a lower CF and improving sprouting rates which currently average 67%. In conclusion the CF of PSS produced in the Central-South region of Brazil is 23.2 g CO<sub>2</sub>-eq/PSS, with the background being the largest contributor to this impact (93.6%), followed by production in nursery (5,9%) and transport (0,4%). A key highlight of the study is the use of photovoltaic energy in the system.

**Keywords:** Life cycle assessment; Climate change; Greenhouse .

**Financial Support:** FINEP project number 01.13.0295.00 – ref. 0468/12