

Maize crop residues: chemical characterization and biomethane potential

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INTRODUCTION

The **development of the biomethane in Italy** represents an opportunity for EU energy transition objectives and have a positive impact on the agricultural sector.

The **promotion of a sustainable and circular economic model** aims to reduce GHG emissions and mitigate the temperature increase. With a view to the circular economy and environmental sustainability in agriculture, **the valorization of agricultural residues is a strategic issue for the competitiveness of the sector.**

Maize residues, like stovers or stalks, are largely available in the northern Italian area but they are still left on the ground.

THE AIM OF THIS STUDY IS TO EVALUATE MAIZE RESIDUES FOR BIOMETHANE PRODUCTION

METHODS

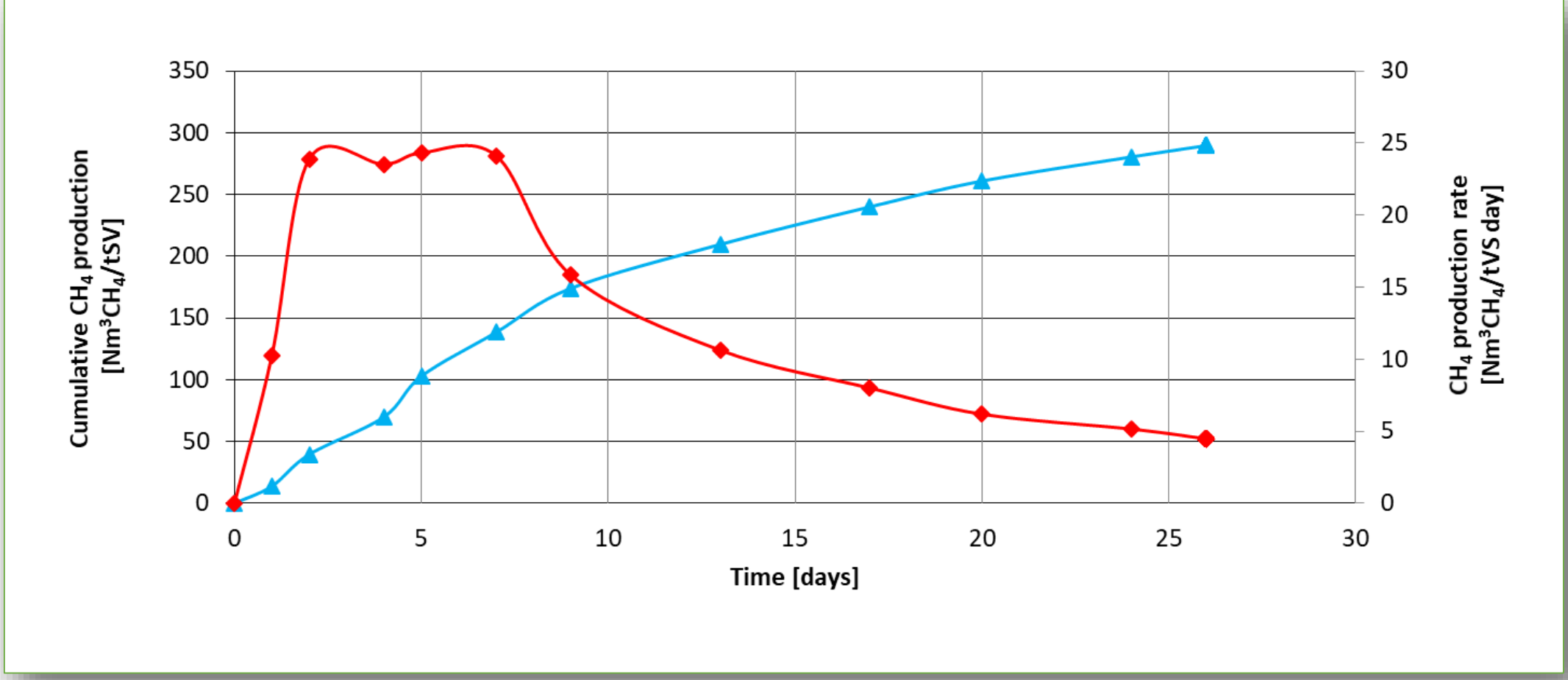
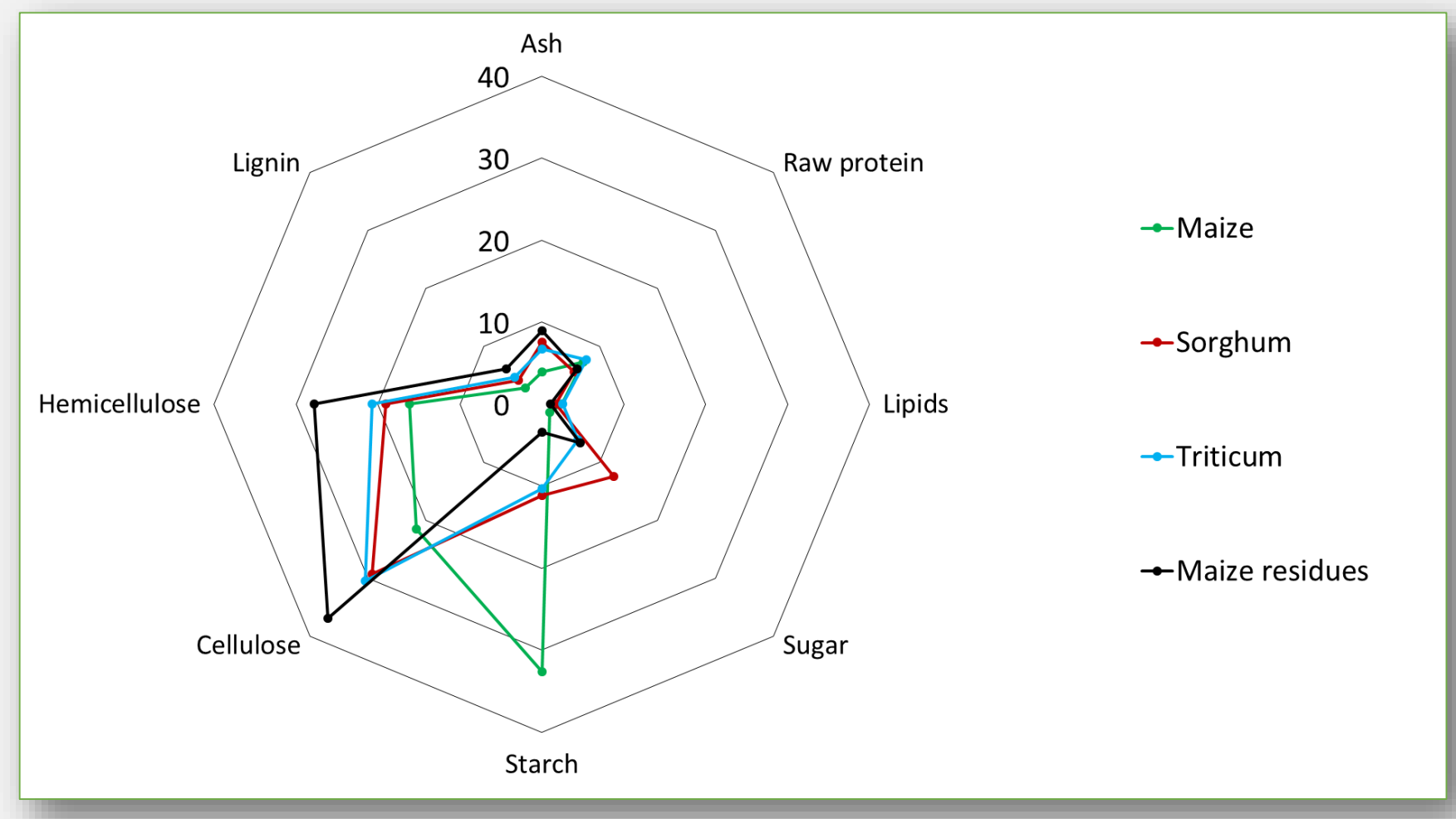
Biochemical Methane Potential test (BMP) was carried out according to UNI EN ISO 11734



GHG savings were calculated according to UNI/TS 11567:2020

RESULTS

- Maize residues Total Solids content: **23-45%**
- **Higher lignocellulosic components and lower starch concentration** than other energy crops (Maize, Sorghum, Triticale)



- **280-290 Nm³CH₄/tVS** (80-90 Nm³CH₄/t at 32%TS) was achieved despite the lignocellulosic components
- **GHG savings** due to the utilization of such residues for energy production would be equal to **6,75 gCO₂eq/t** (19,9 gCO₂eq /MJ)

CONCLUSION



These results are encouraging and **promise the use of maize residues for biomethane production**, allowing to apply the basic principles of circular economy such as **valorize residual matter and nutrients, produce renewable energy and advanced biofuels.**

Future perspectives will include **optimization of harvesting period and technique** to **preserve the quality of maize residues** as much as possible.

