

# EFFECTS OF THE PRETREATMENT PROCESS OF SWEET SORGHUM BIOMASS ON ETHANOL PRODUCTION

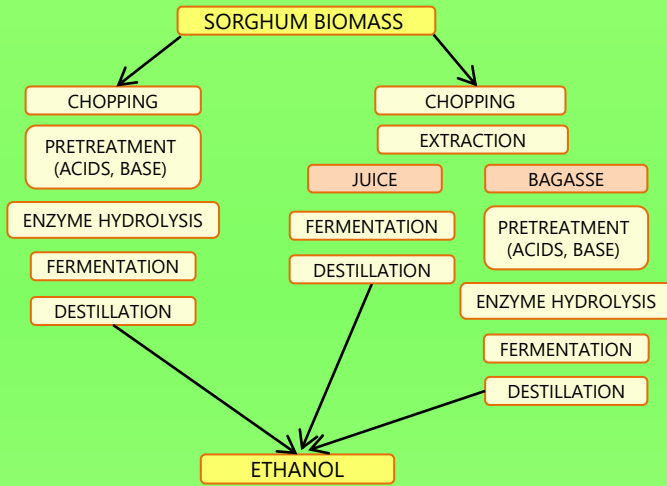
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## INTRODUCTION

The biomass fractionation allows to obtain chemically homogeneous raw materials:

- juice rich in easy fermentable soluble sugars
- bagasse with large content of structural carbohydrates in which the conversion to ethanol is more difficult.

Separation process involves a series of stages: after pre-treatment of raw materials (shredding and acidic or alkaline pre-hydrolysis), followed by enzymatic hydrolysis of cellulose and hemicellulose and in the final stage – ethanol fermentation, distillation and dehydration of ethanol.



Flow chart differences for ethanol production from sorghum



Vincent screw press

## RESEARCH

In the years 2013-2015 at the Wrocław University of Environmental and Life Sciences in southwestern Poland field experiment was carried out.

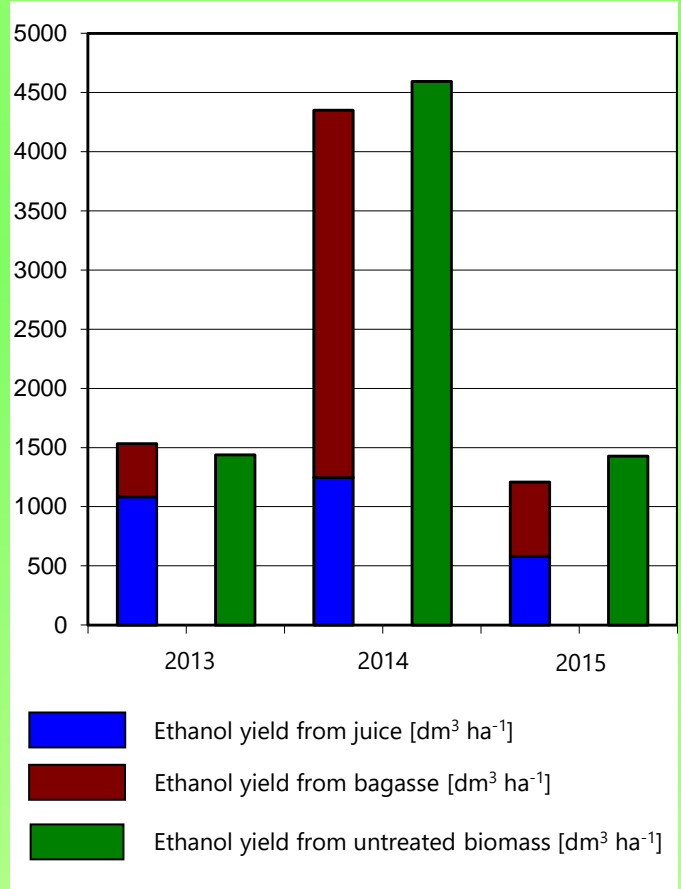
The aim of this study was to assess the suitability of sorghum hybrid Sucrosorgo 304 for biotechnology purposes.

## RESULTS

The ethanol yield per unit area obtained from the untreated sorghum biomass and fractioning biomass on juice and bagasse used piston press with 30 bar pressure was compared.

The unseparated sorghum biomass yields average 2487 L of 100% ethanol ha<sup>-1</sup>. The ethanol yield of juice was 972 L, while the bagasse – 1392 L, which gave a total of 2364 L of 100% ethanol ha<sup>-1</sup>.

An average of 123 L of ethanol ha<sup>-1</sup> less was obtained compared to the raw material, which was not separated on juice and bagasse.



## CONCLUSION

The results showed that the additional stage of pre-treating the raw material did not have a positive effect on the efficiency of ethanol production.

The fractionation of sorghum biomass appears to be an unreasonable stage. In the technology of hydrolysis should not be recommended fractionation.