

2016

Adapted and Non-Adapted Tropical Corn in Central Iowa: 1. Development, Growth and Quality Aspect

Pedro A. Infante Posada
Iowa State University, pinfante@iastate.edu

Kenneth J. Moore
Iowa State University, kjmoore@iastate.edu


Sotirios V. Archontoulis
Iowa State University, sarchont@iastate.edu

Andrew W. Lenssen
Iowa State University, alenssen@iastate.edu

M. Paul Scott
United States Department of Agriculture

See next page for additional authors

Follow this and additional works at: http://lib.dr.iastate.edu/agron_conf

 Part of the [Agriculture Commons](#), [Agronomy and Crop Sciences Commons](#), and the [Horticulture Commons](#)

Recommended Citation

Infante Posada, Pedro A.; Moore, Kenneth J.; Archontoulis, Sotirios V.; Lenssen, Andrew W.; Scott, M. Paul; and Fei, Shuizhang, "Adapted and Non-Adapted Tropical Corn in Central Iowa: 1. Development, Growth and Quality Aspect" (2016). *Agronomy Conference Proceedings and Presentations*. 20.
http://lib.dr.iastate.edu/agron_conf/20

This Abstract is brought to you for free and open access by the Agronomy at Iowa State University Digital Repository. It has been accepted for inclusion in Agronomy Conference Proceedings and Presentations by an authorized administrator of Iowa State University Digital Repository. For more information, please contact digirep@iastate.edu.

Authors

Pedro A. Infante Posada, Kenneth J. Moore, Sotirios V. Archontoulis, Andrew W. Lenssen, M. Paul Scott, and Shuizhang Fei

Start

Browse by
Section/Division of
Interest

View At a Glance

Author Index

CEU Approved
Sessions

217-9 Adapted and Non-Adapted Tropical Corn in Central Iowa: 1. Development, Growth and Quality Aspect.

See more from this Division: [C02 Crop Physiology and Metabolism](#)
See more from this Session: [Crop Physiology and Metabolism Oral](#)

Tuesday, November 8, 2016: 11:45 AM
Phoenix Convention Center North, Room 123

Pedro A. Infante Posada¹, **Kenneth J. Moore**², **Sotiris V Archontoulis**¹, **Andrew W. Lenssen**³, **M. Paul Scott**⁴ and **Shui-Zhang Fei**⁵, (1)Iowa State University, Ames, IA
(2)1571 Agronomy Hall, Iowa State University, Ames, IA
(3)Agronomy, Iowa State University, Ames, IA
(4)1407 Agronomy Hall, USDA-ARS, Ames, IA
(5)257 Horticulture Hall, Iowa State University, Ames, IA

Abstract:

Adapted and Non-Adapted Tropical Corn in Central Iowa: 1. Development, Growth and Quality Aspects

Recent research has shown a high theoretical potential for ethanol production based on both stover and grain as sources, using lignocellulosic and fermentation processes respectively. Corn germplasm has been even broadly studied for grain production, but scant research has been done on current commercial cultivars in regards to biomass production. However, tropical corn germplasm, corn conventionally grown in tropical regions, has been studied as a potential source for biomass accumulation over grain. The comparison between tropical and temperate corn with a focus on biomass production has not yet been explored under Iowa day-length conditions.

This study identifies the adaptability of tropical germplasm to central Iowa by means of studying the crop development, the productivity of temperate and tropical germplasm for biomass yields, and the quality of temperate and tropical germplasm as a lignocellulosic source for ethanol production. Field trials were established at Sorensen Research Farm in Boone County, IA, US, during the 2014 and 2015 growing seasons to evaluate adaptation of tropical germplasm, biomass productivity and quality coefficients.

Results of the study showed that unadapted tropical corn flowered later and had 20% greater biomass yields on average than adapted corn (20 Mg.ha⁻¹ for unadapted versus 16 Mg.ha⁻¹ for adapted), while adapted yielded relatively more grain. In addition, a separate study showed that temperate corn performed better for grain yields and grain development, followed by adapted tropical corn, while non-adapted tropical corn performed better for vegetative development, again producing up to 20% higher biomass yields. In addition, results showed that the quality of the feedstock is equivalent for temperate and tropical corn in terms of cellulose, hemicellulose and lignin content. These results indicate a high potential for unadapted tropical corn as a source of biomass production in central Iowa.

See more from this Division: [C02 Crop Physiology and Metabolism](#)
See more from this Session: [Crop Physiology and Metabolism Oral](#)

[<< Previous Abstract](#) | [Next Abstract](#)