

# Feasibility of a single side-dress of stabilized nitrogen in maize under semiarid irrigated conditions



Noemí Mateo-Marín\*, Dolores Quílez, Mónica Guillén, Ramón Isla (\*nmateo@cita-aragon.es)

Agrifood Research and Technology Centre of Aragón (CITA), Aragón Government. Avda. Montañana 930, 50.059 Zaragoza (Spain)

## Introduction

Fertilizers with nitrification inhibitors improve the synchronization between crop demand and available soil nitrogen.

Potential advantages are the reduction of the number of fertilizer applications, the increase of nitrogen use efficiency, the decrease of the risk for nitrate leaching, and the reduction of gas emissions ( $N_2O$ ).

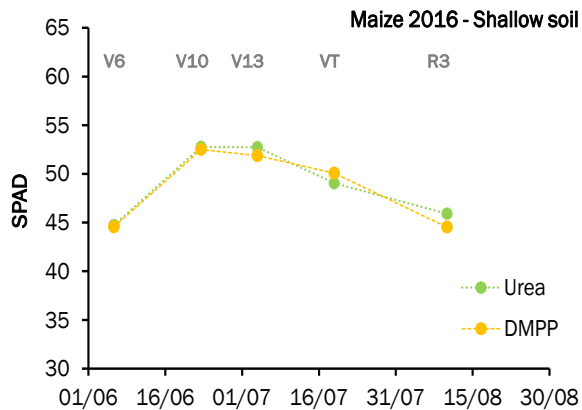
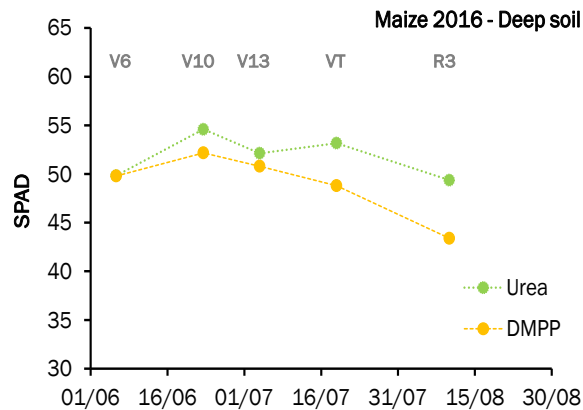
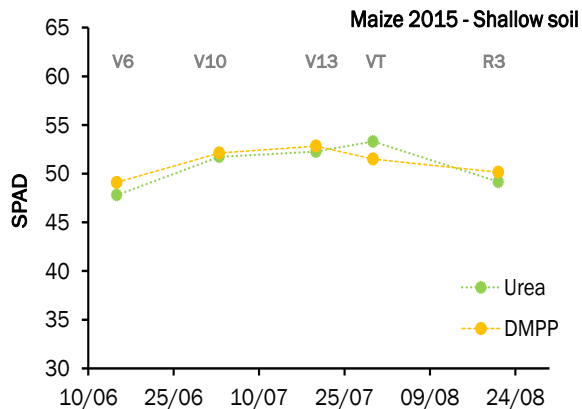
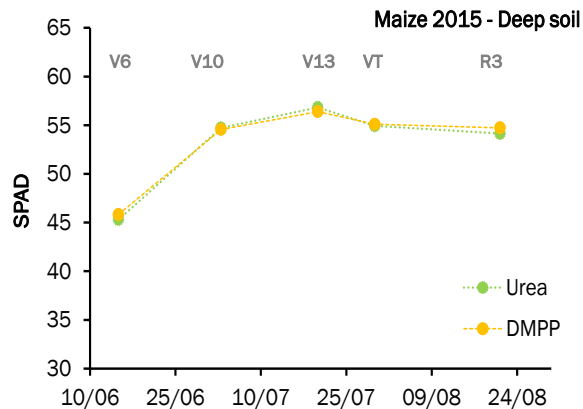
### Objective:

To assess, in two contrasting soil types, if a single side-dress application of N fertilizer with inhibitor can replace the standard double side-dressing N fertilizer application of maize.

## Materials and methods

- Located in the middle Ebro River Basin (Zaragoza, Spain), during 2015 and 2016.
- Maize crop (hybrid 'Pioneer P1758') under sprinkler irrigation.
- Two soil types, **Deep** vs. **Shallow** with contrasting soil water holding capacity.
- Fertilizer treatments:
  - Urea**: urea split into two applications at V6 and V13.
  - DMPP**: a single application (V6) of urea with 3,4-dimethyl pyrazole phosphate (NI).
- 250 kg N ha<sup>-1</sup> available to the crop = N fertilizer + soil nitrate at pre-planting.
- Nutritional status of maize was evaluated with periodic measurements of leaf greenness (SPAD).
- Grain yield, total aerial biomass and total N uptake were measured, and nitrogen use efficiency was calculated as total N uptake/N applied.

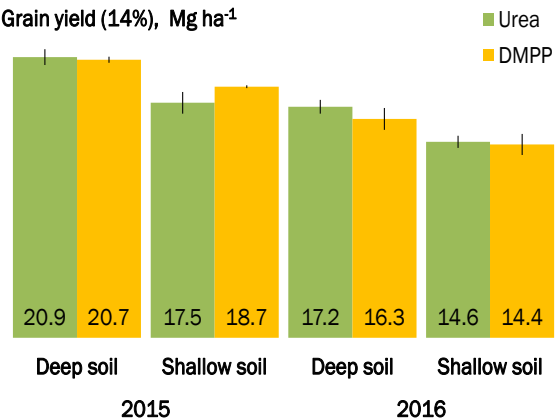




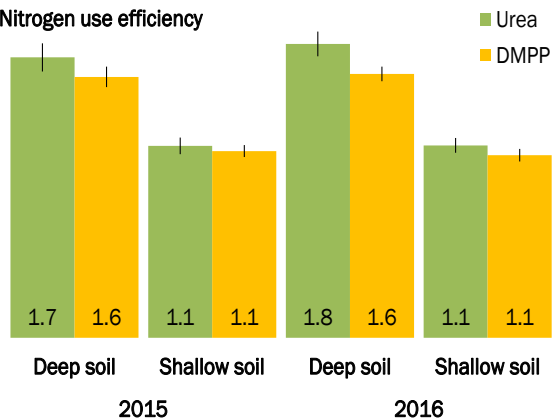
## Results and Discussion

Chlorophyll meter readings did not display significant differences ( $p > 0.05$ ) between treatments in any year for the two soil types.

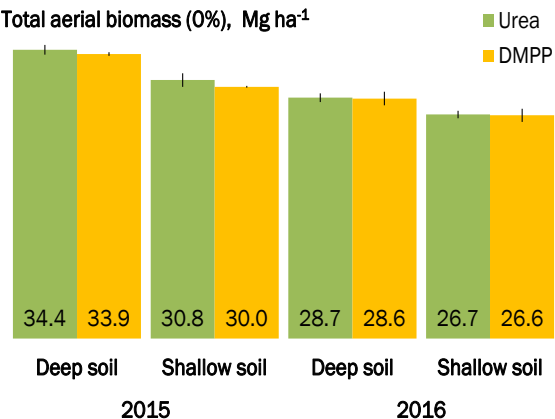
Grain yield (14%), Mg ha<sup>-1</sup>



Nitrogen use efficiency



Total aerial biomass (0%), Mg ha<sup>-1</sup>



## Results and Discussion

No differences ( $p > 0.05$ ) were found in grain yield and total aerial biomass among treatments in the two seasons and for the two soils.

Differences in nitrogen use efficiency among treatments were not detected ( $p > 0.05$ ) for any soil and season.

# Feasibility of a single side-dress of stabilized nitrogen in maize under semiarid irrigated conditions



Noemí Mateo-Marín\*, Dolores Quílez, Mónica Guillén, Ramón Isla (\*nmateo@cita-aragon.es)

Agrifood Research and Technology Centre of Aragón (CITA), Aragón Government. Avda. Montañana 930, 50.059 Zaragoza (Spain)

## Conclusions

The use of urea with DMPP allows reducing the number of side-dress N applications in maize without compromising grain yields under good irrigation practices.

Reducing the use of farm machinery has advantages like:

- ✓ Save the fuel necessary for a second fertilizer application.
- ✓ Reduce the soil compaction.