

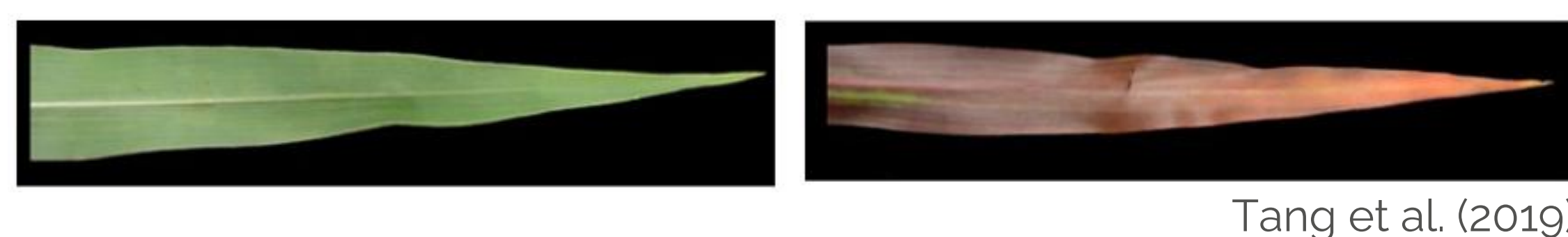
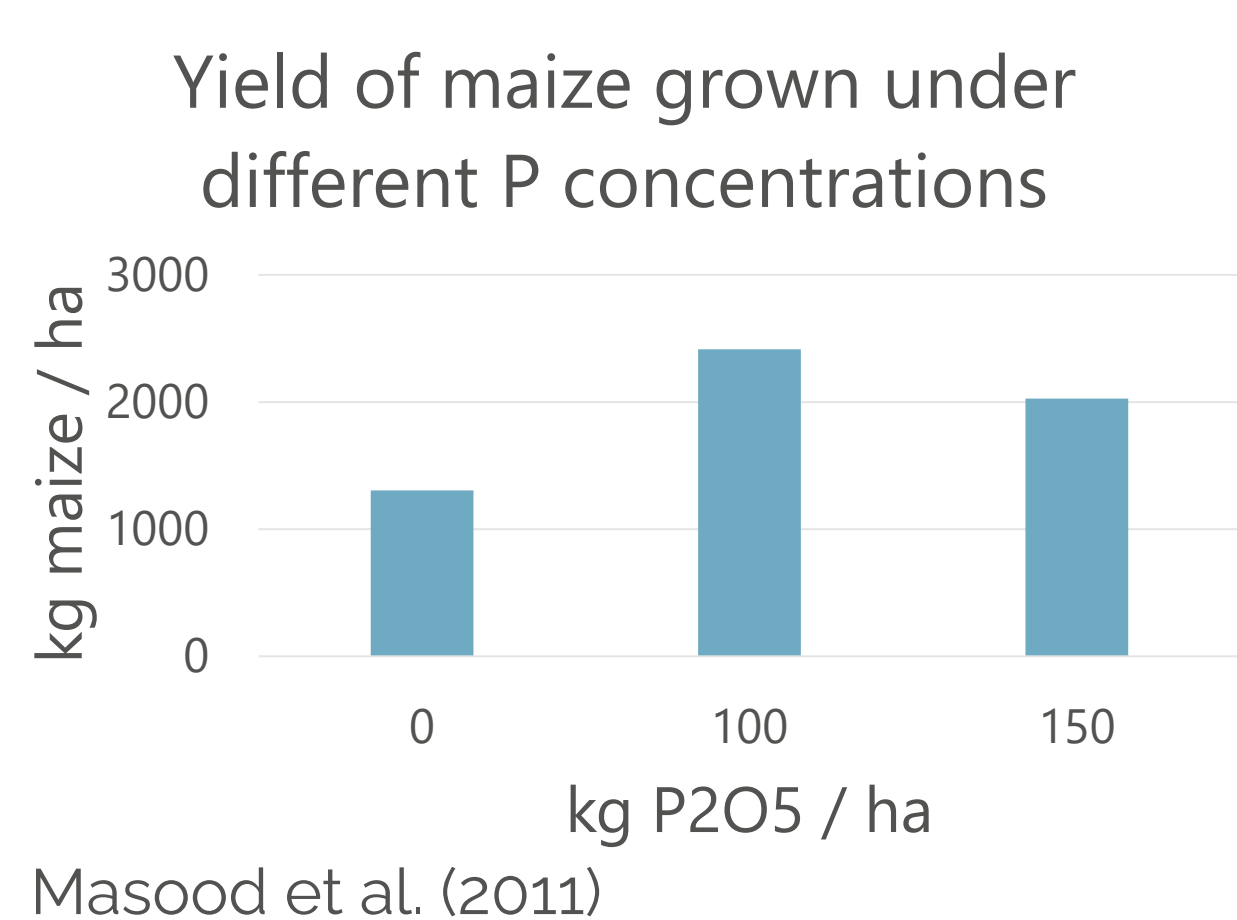
Linoleic acid decreases and oleic acid increases in maize grains with the phosphorus supplied during cultivation

AUTHORS

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I. INTRODUCTION

- High intake of **linoleic acid**, common in the Western diet, contributes to inflammation and cardiovascular diseases
- The **fatty acid profile can be modulated** during the cultivation of crops
- Phosphorus (P)** is a key nutrient for plants, required for high yields and crop development



Tang et al. (2019)

- P plays a key role in metabolic pathways and the biosynthesis of many compounds
- In algae, P supply is inversely related with linoleic acid content, **but studies in plants are not conclusive**

II. AIM

Study the impact of P supply on the fatty acid profile in maize grains.

III. MATERIALS AND METHODS

First experiment: different P application methods

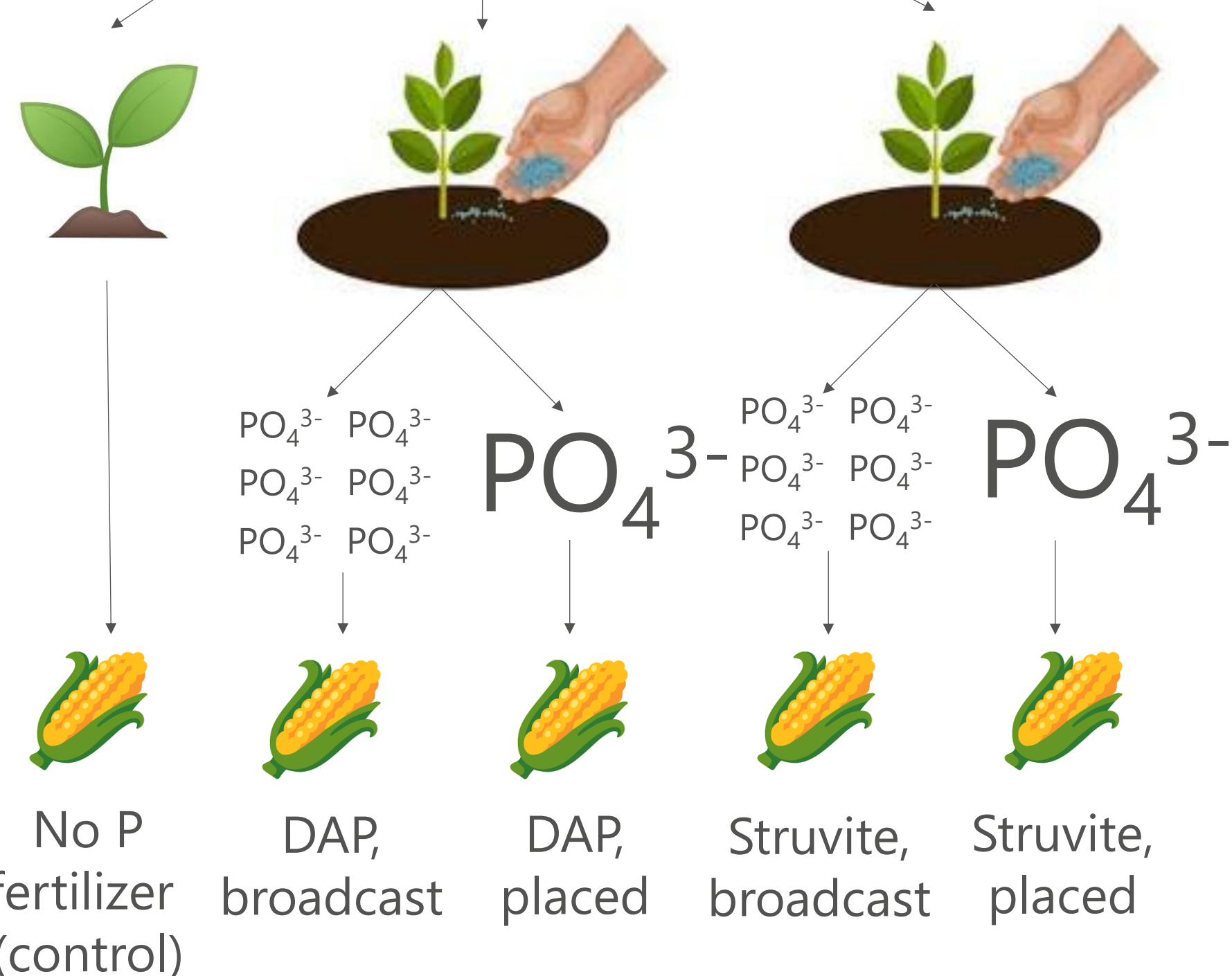
Cultivation in P highly deficient soil



Two maize hybrids:
- LG30258
- Ricardinio

Two P fertilizers:
- DAP (diammonium phosphate)
- Struvite

Two application methods:
- Broadcast
- Placed



Second experiment: different soil P concentrations

One maize hybrid:
- Ricardinio



Cultivated in **four soils** with different P contents:
- Highly deficient
- Deficient
- Optimum
- High

Without and with P fertilizer (DAP, placed)



Fatty acid profile analysed by GC (Lux et al., 2021)

IV. RESULTS

■ LG30258
■ Ricardinio

Black lines: significant differences to control.
Green lines: significant differences between application methods.

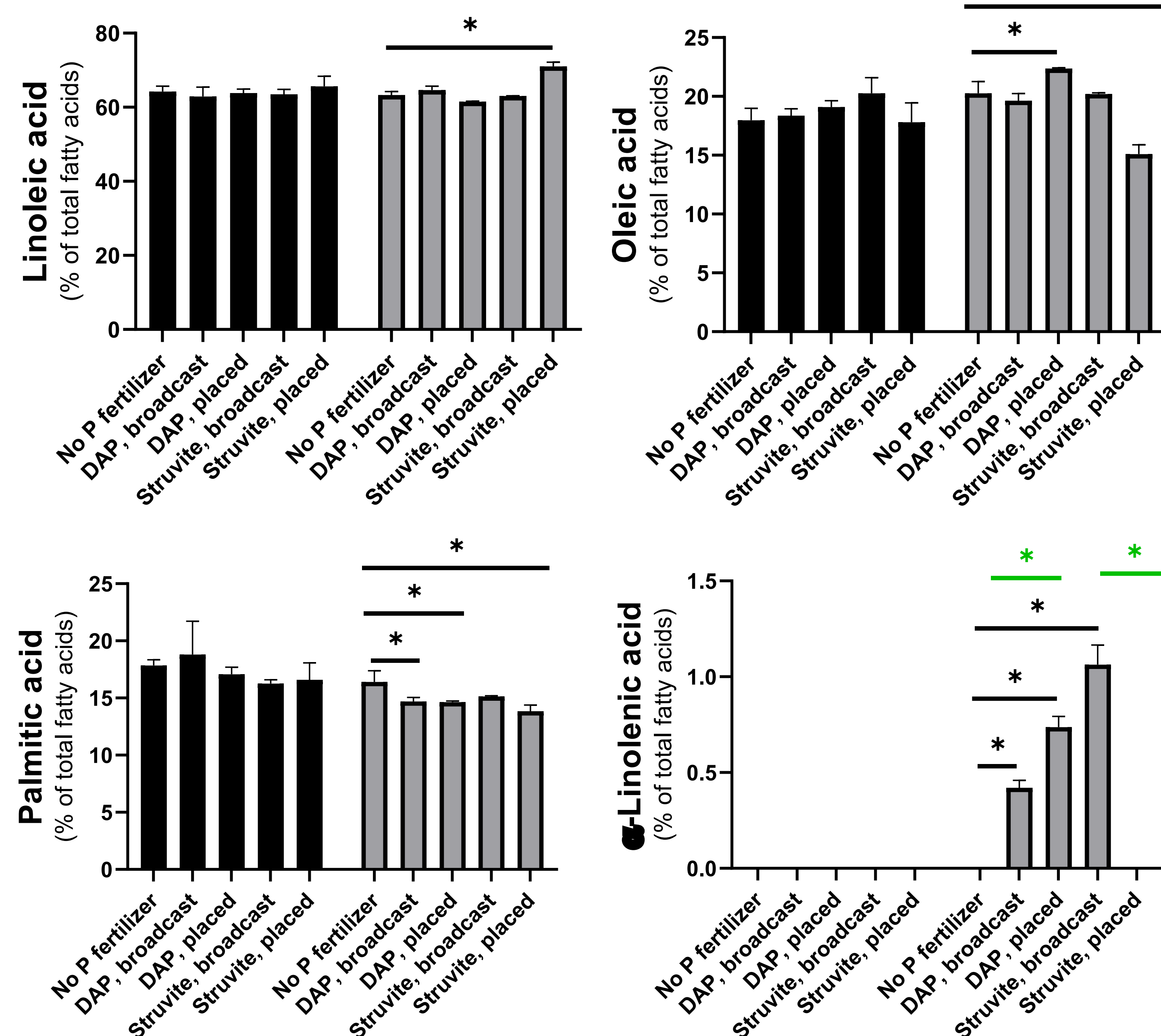


Figure 1. % of linoleic, oleic, palmitic and α -linolenic acid (left) of maize grains under different P application methods.

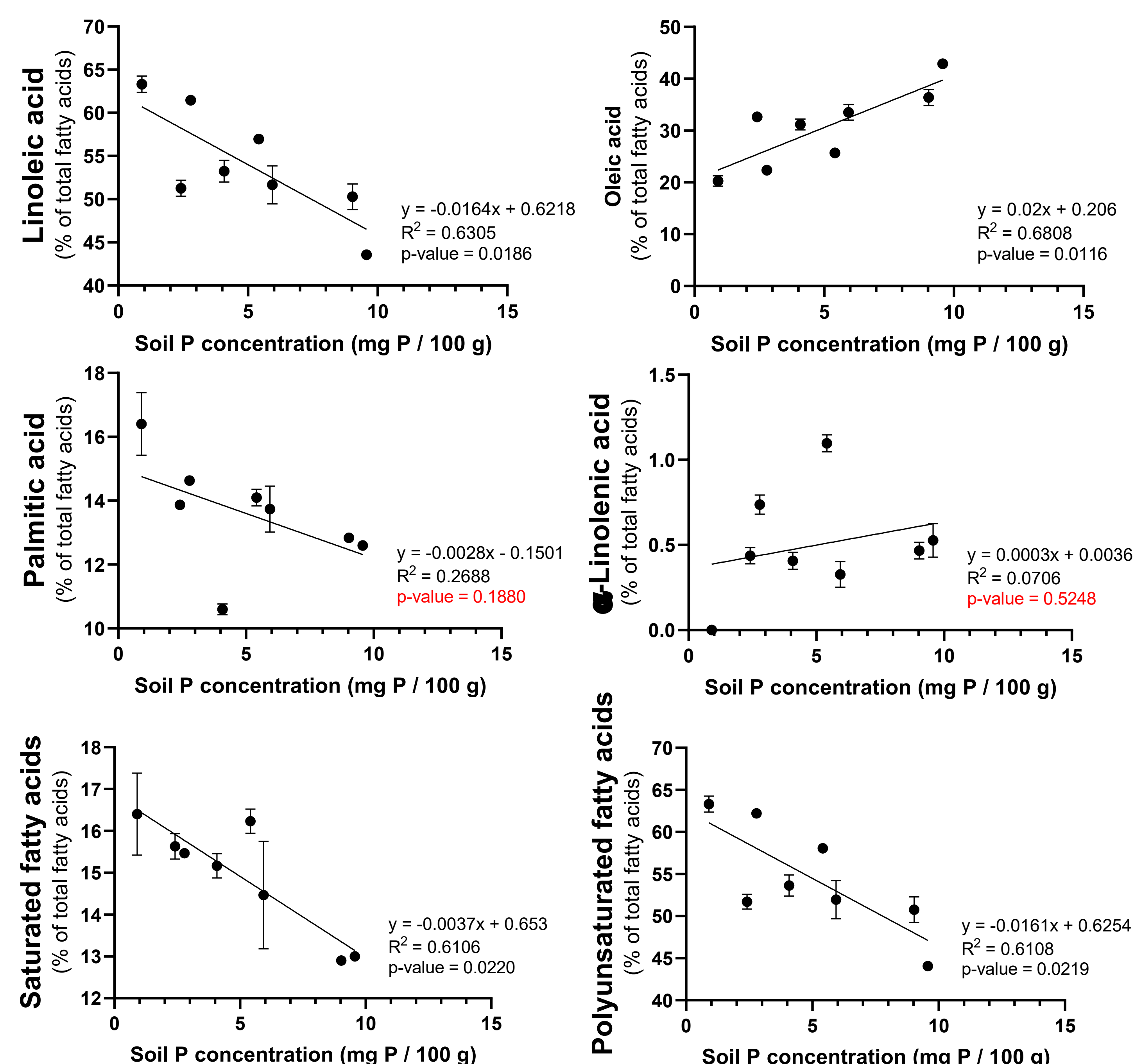


Figure 2. Correlation of % of linoleic, oleic, palmitic, α -linolenic, saturated and polyunsaturated fatty acids with soil P concentration.

V. CONCLUSIONS

- The fatty acid profile was **not affected by the application method of the P fertilizer**
- The **concentration of P supplied affected the fatty acid profile: increased the oleic acid and decreased the linoleic acid**, and total saturated fatty acids and polyunsaturated fatty acids