INTRODUCTION

Average corn (Zea mays L.) grain yield per harvested area has significantly increased in the US for past few decades. However, it is not clear whether this average corn yield change is primarily due to: uniform yield increase across all yield environments (Fig. 1A), partial yield increase driven by changes in parts of corn yield environments (Fig. 1B), a change in frequency without actual yield increase (Fig. 1C), or combination of all the above (Fig. 1D).

Objective

- To examine corn yield trends 1987-15
- identify cause for yield increased and suggest direction for future research.

MATERIALS & METHODS

Two sources of data used for this analysis were a field study (DuPont Pioneer®) and USDA survey data.

RESULTS and DISCUSSION

A. Yield trend by environments

1. Field data

2. USDA survey data

B. Average trend

2. USDA survey data

Figure 1. Theoretical framework for scenarios that result in an overall average yield improvement. An overall average yield increase (or a mean for a region) can be a result of uniform increase across all environments (a), partial increase across some yield environments (b), a change in frequency without actual yield increase (c), or combination of all the above (d).

(i) Yield improvement was recorded in the high- (HY) and very high-yielding (VHY) environments
(ii) the proportion of HY and VHY environments increased
(iii) yield for medium (MY) and low-yielding (LY) environments did not significantly change over time, and
(iv) the proportion of LY and MY environments has decreased over time.

CONCLUSION

An increase in the yield ceiling and proportion of high yielding environments (or a substantial decrease in the proportion of MY and LY environments) were the main reasons responsible for yield improvement.

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