

THE RESISTANCE OF THE SELECTED SOYBEAN CULTIVARS TO THE OCCURRENCE OF CHOSEN FUNGAL DISEASES

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CONTEXT

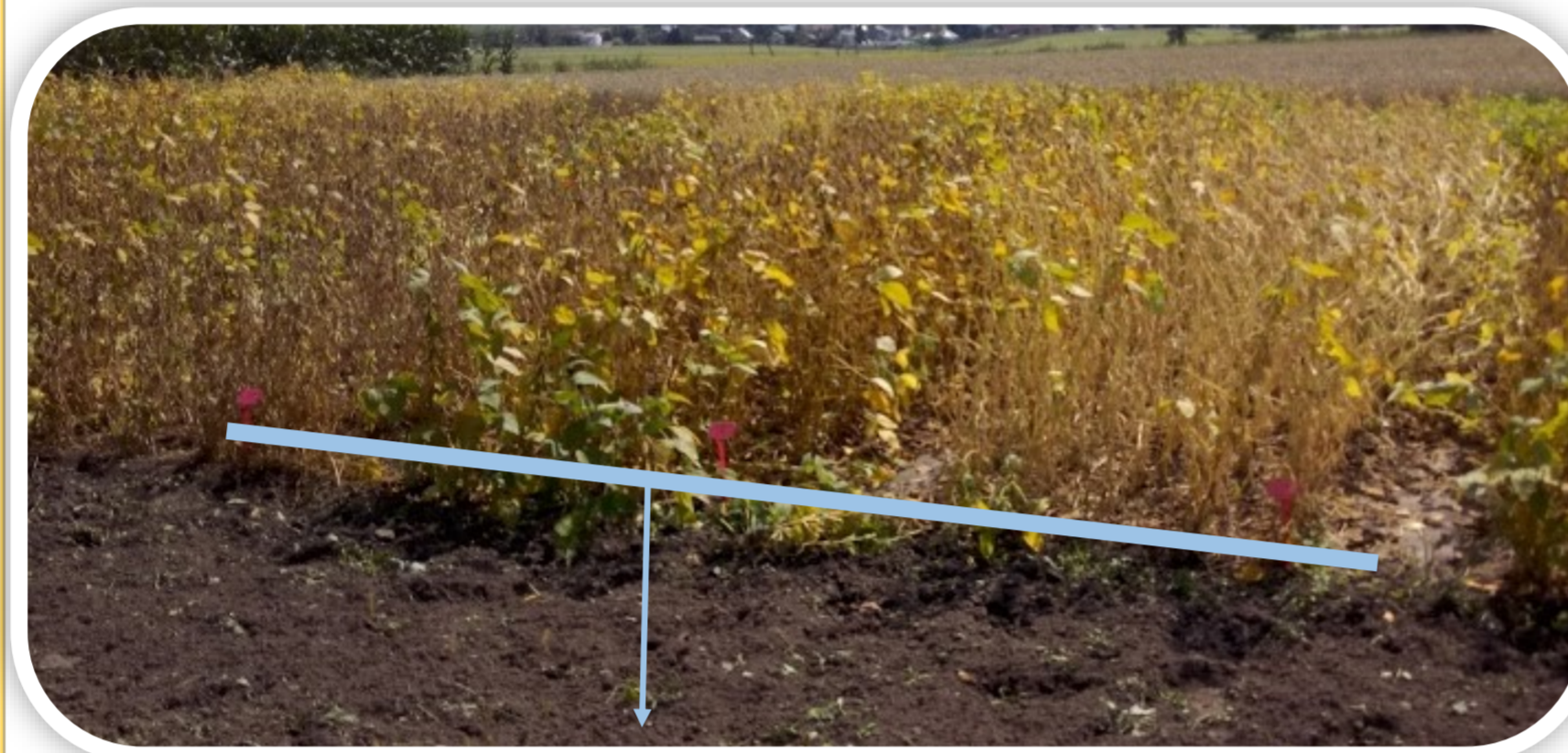
More than 300 species of pathogens attack soybean worldwide, although relatively few cause significant economic damage [Hartman and Curtis 2010]. It is believed that soybean diseases are not a major threat in Poland. Nevertheless, diseases that mostly occur on soybean plants include: root-rot, ascochytirosis, anthracnose, septoriosi – brown spot, fusariosi (root and wilting), cercospora leaf blight, purple seed stain and fusary browning of pods [Praczyk and Nawracała 2012]. The current goal of Polish breeders is to best adapt soybean varieties to the climatic conditions of Poland. Currently, 32 cultivars are registered by COBORU.

Plant health status was assessed on a 9-point scale, according to the COBORU methodology [2016]. The following scale was used:

9	• healthy plant (no symptoms of the disease)
8	• trace occurrence of the disease
7	• small spots, few (mild infection)
6	• mild to moderate infection (small patches, frequent occurrence)
5	• medium infection (small numerous patches, or large individual ones)
4	• medium to severe infection (spots covering 25% of plants)
3	• severe infection (very many spots with premature dying of the affected part of the plant)
2	• severe infection to very strong (extensive patches causing distortion and dying-out of individual parts of plants or whole shoots)
1	• very severe infestation (spots covering more than 50% of the plant surface or entire plants are deformed and die off)

METHODS

A one-factorial field experiment was established at the Experimental Station of the University of Agriculture in Prusy (50° 07'01"N and 20° 05'19"E), near Krakow. The two years field experiment was based in black earth soil with the average soil abundant in nutrients, and using a randomized block method. The experiment was set in three replications and was a comparison of 8 soybean cultivars with different earliness of maturity: early cultivars – Augusta, Erica; mid-early cultivars – Abelina, Merlin, Mavka; mid-late and late cultivars – Aligator, Lissabon, Sultana. Diseases and seed yield were evaluated. Diseases were evaluated by according to COBORU methodology. Mean scale of diseases infestation was implemented.



Early cultivars



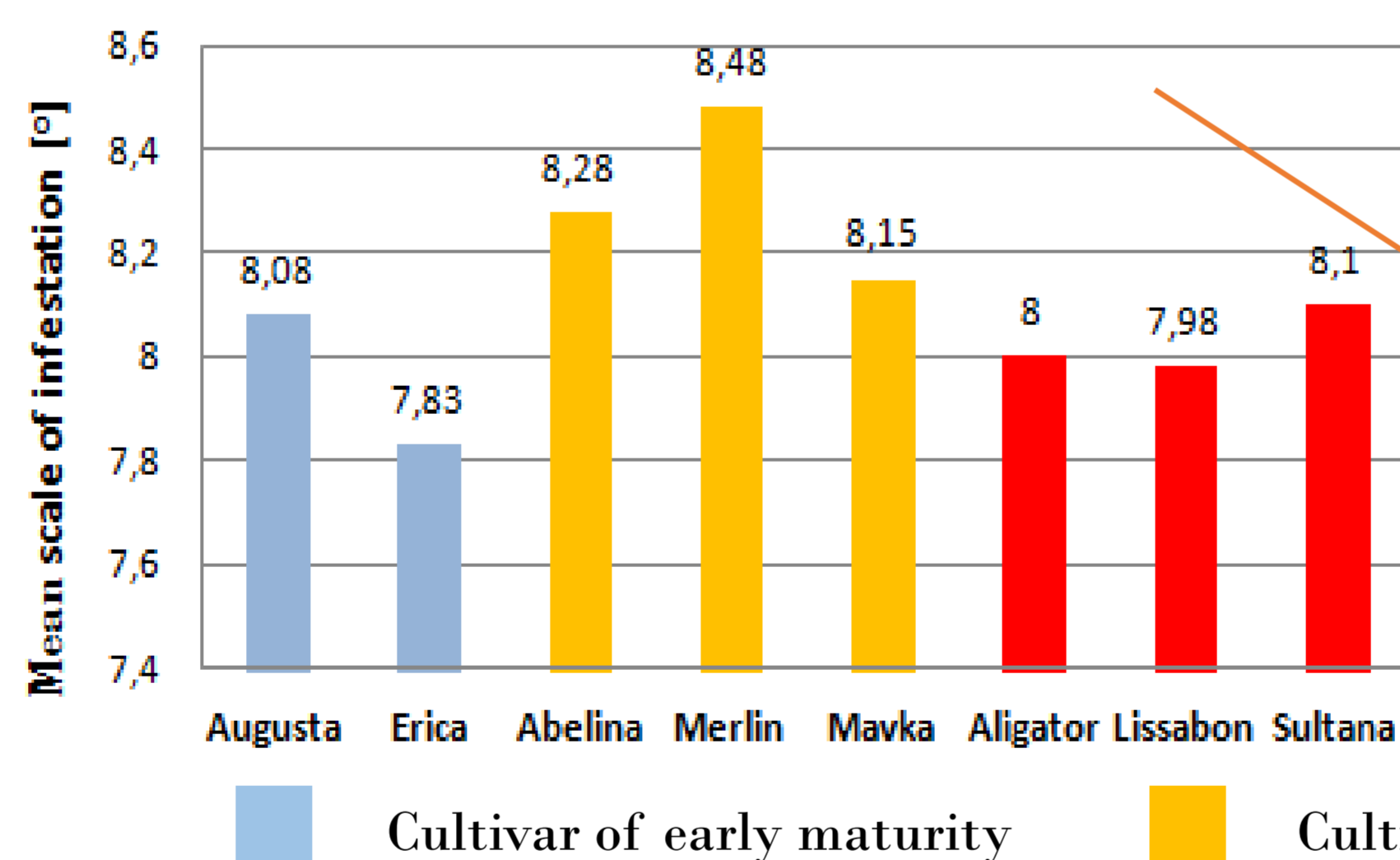
Mid-early cultivars

Mid-late and late cultivars

AIM

The aim of this study was to assess the resistance of the selected soybean cultivars of various maturity groups to the occurrence of chosen fungal diseases on soybean plants.

Average infestation index of soybean leaves based by *Fusarium oxysporum*

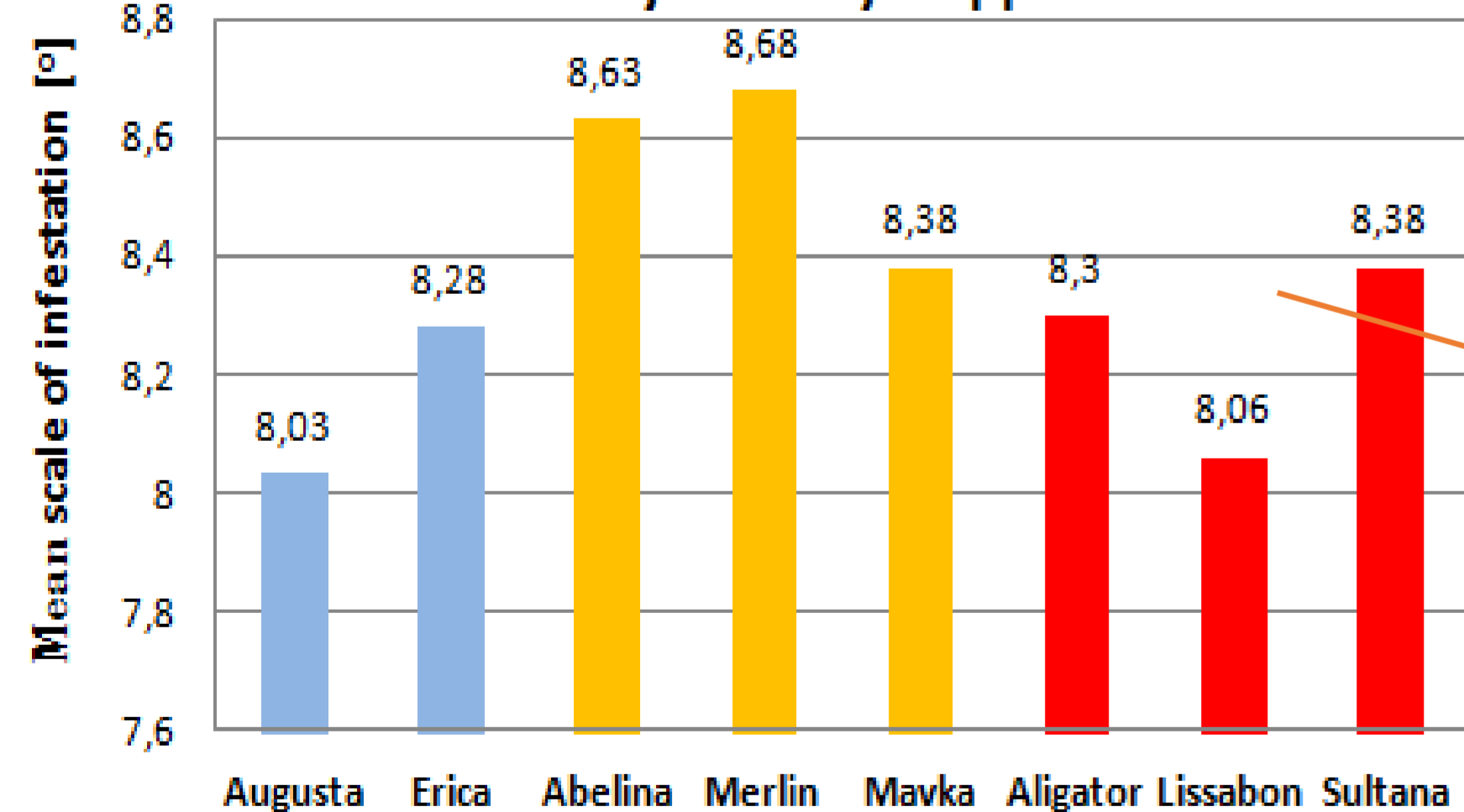


Cultivar of early maturity

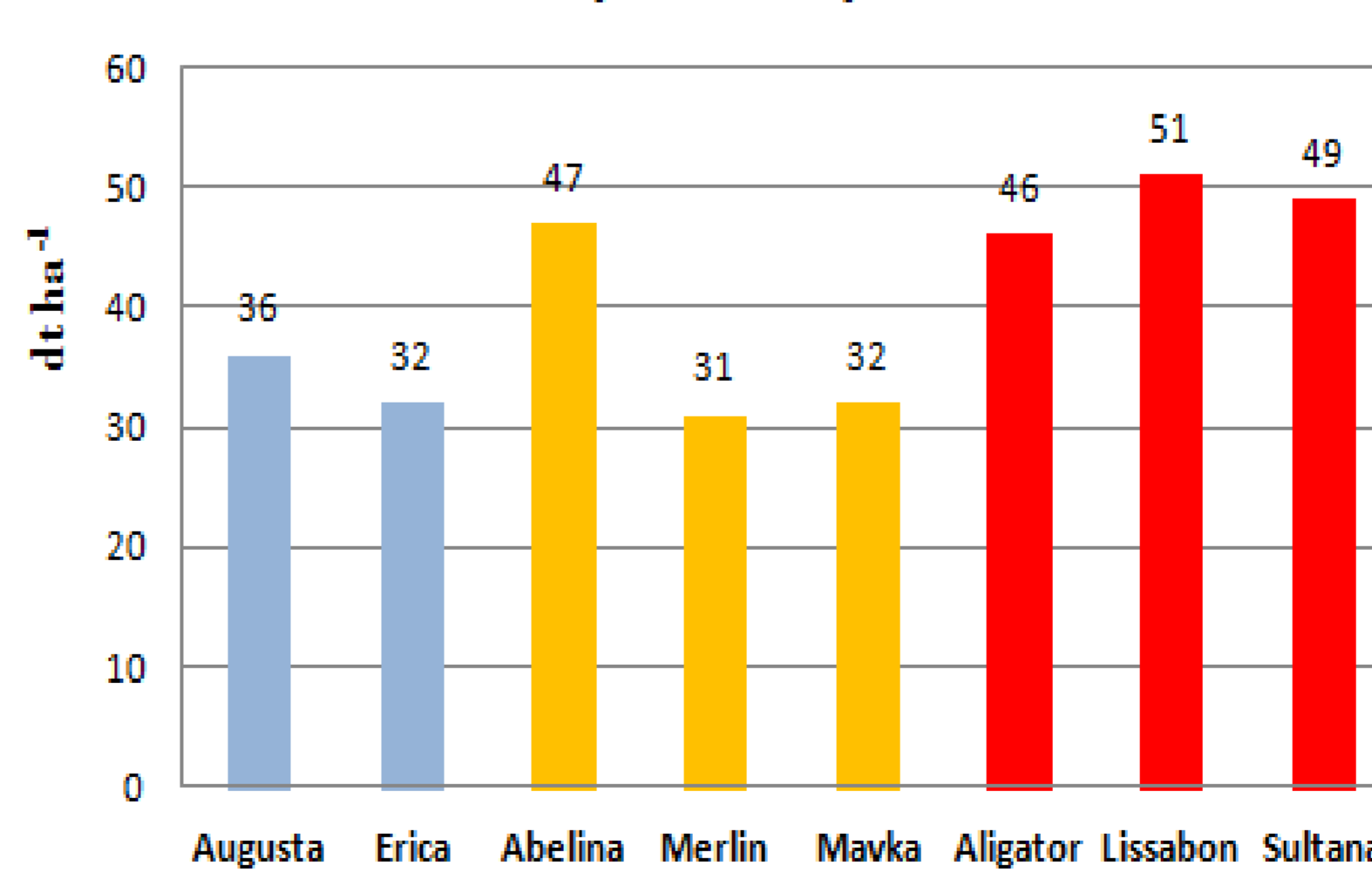
Cultivar of mid-early maturity

Cultivar of late and mid-late maturity

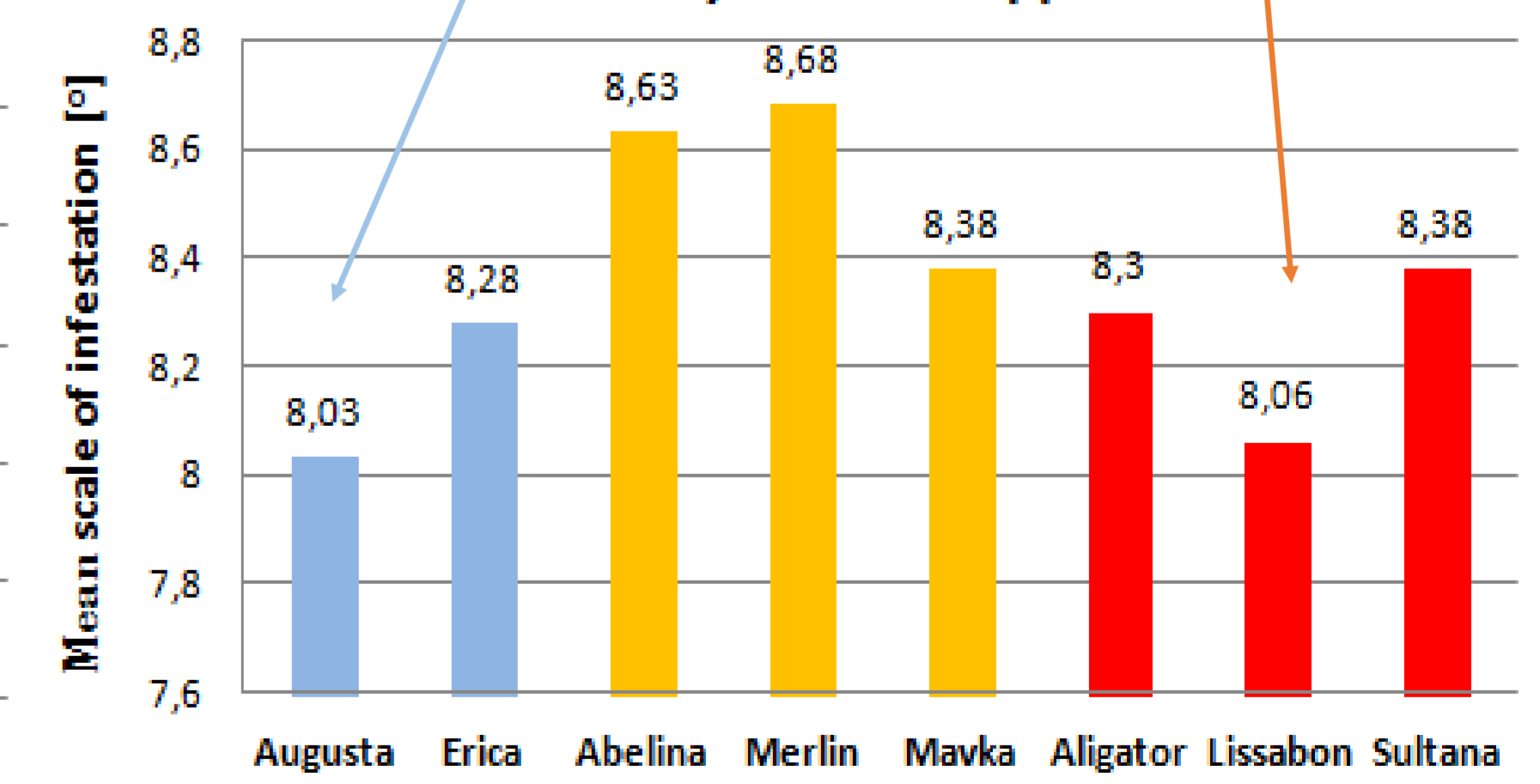
Average infestation index of soybean pods based by *Ascochyta* spp.



Seed yield of soybean



Average infestation index of soybean pods based by *Fusarium* spp.



RESULTS

It has been shown that the selection of cultivars determined the yield and plant healthy. Mid-late and late cultivars had a significantly higher yield than others. Among the compared cultivars, cv. Lissabon obtained a significantly higher seed yield (5.1 t ha⁻¹) in comparison to the lowest yield of cv. Merlin (3.1 t ha⁻¹). The most affected cultivars were Lissabon (7.95°) and Augusta (7.98°). Significant differences in the infection of plants with fusary browning of pods were noted in both years of research in all cultivars. The largest infection (7.70°) was noted in 2018 for Erica cultivar. Very-early and early maturing cultivars tend to give scientifically significantly smaller yields than cultivars from mid-early and mid-late group, regardless the weather conditions. Cultivar Merlin gives high, stable yields regardless the temperature and precipitation conditions. Cultivar Merlin is more resistant to the infection by *Fusarium* spp., causing a root rot disease, in conditions of warm and wet weather (2017), when compared to dry and warm conditions (2018).

REFERENCES

- Hartman G.L., Curtis B.H. 2010. Diseases of Soybean and Their Management. [In:] The Soybean botany, production and uses. Editor: G. Singh. CAB International, United Kingdom, 283-284.
Praczyk T., Nawracała J., Balcer G., Bubniewicz P., Filoda G. 2012. Metodyka integrowanej ochrony roślin, IOR – PIB, Poznań, 14.