



Agroresursu un
ekonomikas
institūts



The occurrence of weed species in arable fields in Latvia, as a function of crop rotation

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Research in two projects:

- 1) The project “**Integrated pest management for weed control in arable crops for sustainable use of the environment and resources**” supported by European Agricultural Fund for Rural Development (EAFRD) (2013-2014)

To develop recommendations for weed control in economically important crops according to Integrated Plant Protection principles.

- 2) The project “**Recommendations for effective control of wild oat and other widespread weed species in Latvia**” supported by Ministry of Agriculture (2015-2018)

To obtain scientific data on weed populations in order to find out what factors influence weed population structure and density in Latvia and to develop recommendations for weed control under Latvian climatic conditions.

Hypothesis of the research

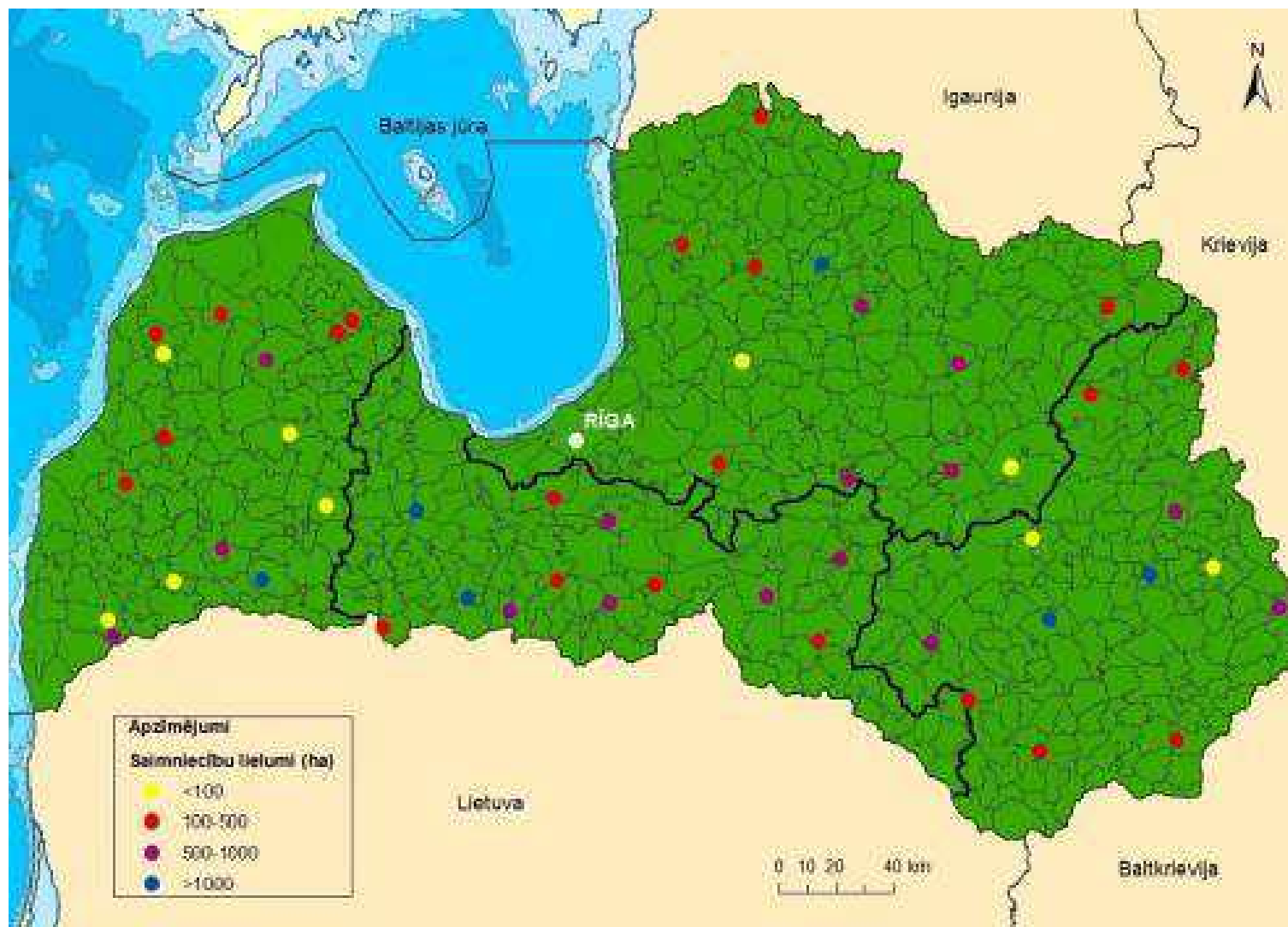
Crop rotation can be used as a tool for weed management. It also affects weed species occurrence.

Our hypothesis was that infestation of fields with certain weed species could be controlled by decreasing the proportion of cereals in a crop rotation.

Material and methods

Weed survey

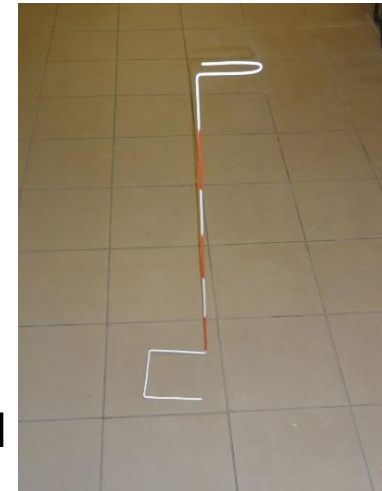
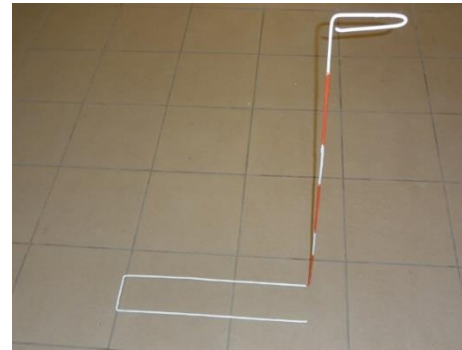
- In four historical regions of Latvia - Kurzeme, Latgale, Vidzeme and Zemgale
- From 2013 to 2015 (field data from 2011 to 2015)
- Randomly chosen 50 farms with different size
 - in Kurzeme . 14 farms
 - other regions . 12 farms
- Weed counting in 6 crop fields of each farm.



Geographic location and a size of farms

Weed counting

- The method by Rasi z and Tauri a, 1982
- Once per growing period . from 3rd decade of June till 2nd decade of July
- Weed counting frame
 - 500 cm² . maize, potatoes
 - 200 cm² . cereals, oilseed rape
- Weed identification at species or genus level.
- Plant density was calculated using correlation table based on negative binomial distribution.
- Field information . crop, crop roatation, soil, crop management, fertilizers, crop protection, weeds near the field
- For statistical calculations crop fields were divided into two groups with different proportion of cereals in each:
 - group 1 . proportion of cereals in crop rotation **0–60%**
 - group 2 . proportion of cereals in crop rotation **80–100%**





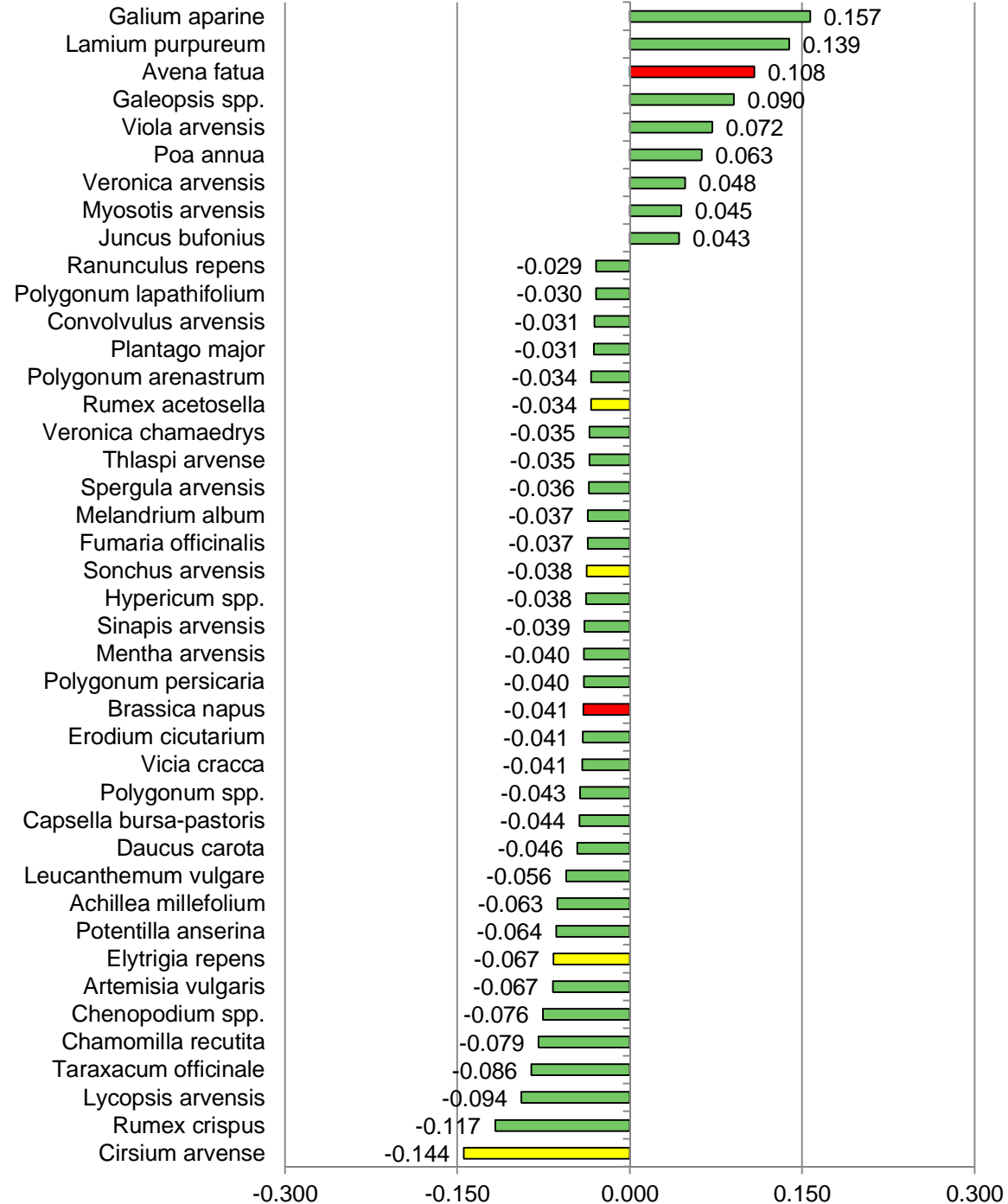
Results



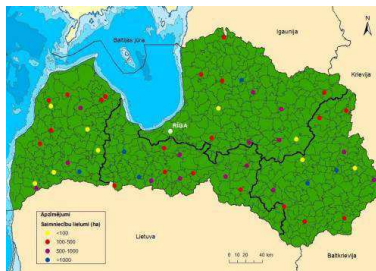
Latvia



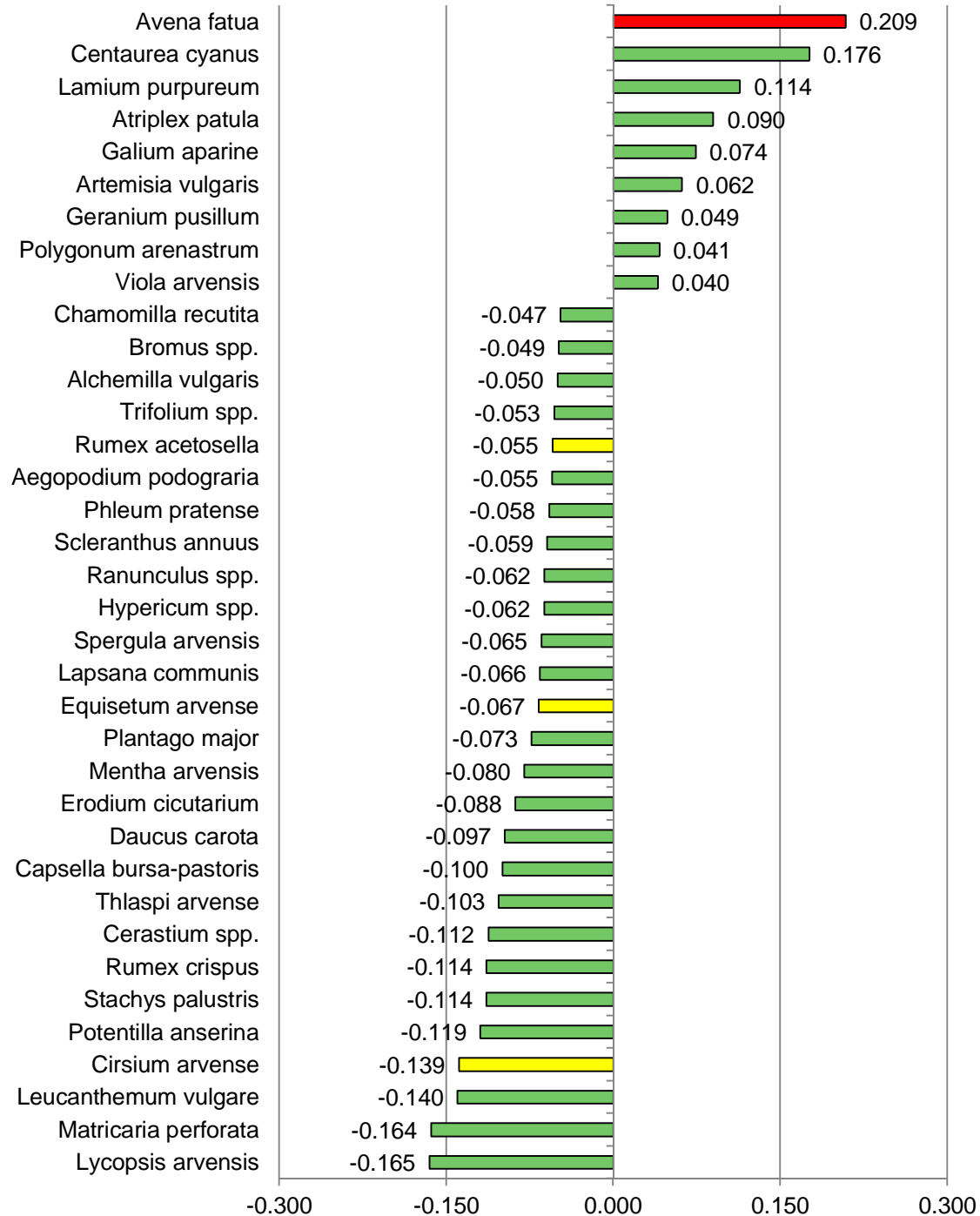
Changes in weed species occurrence, if increase proportion of cereals in crop rotation



Kurzeme



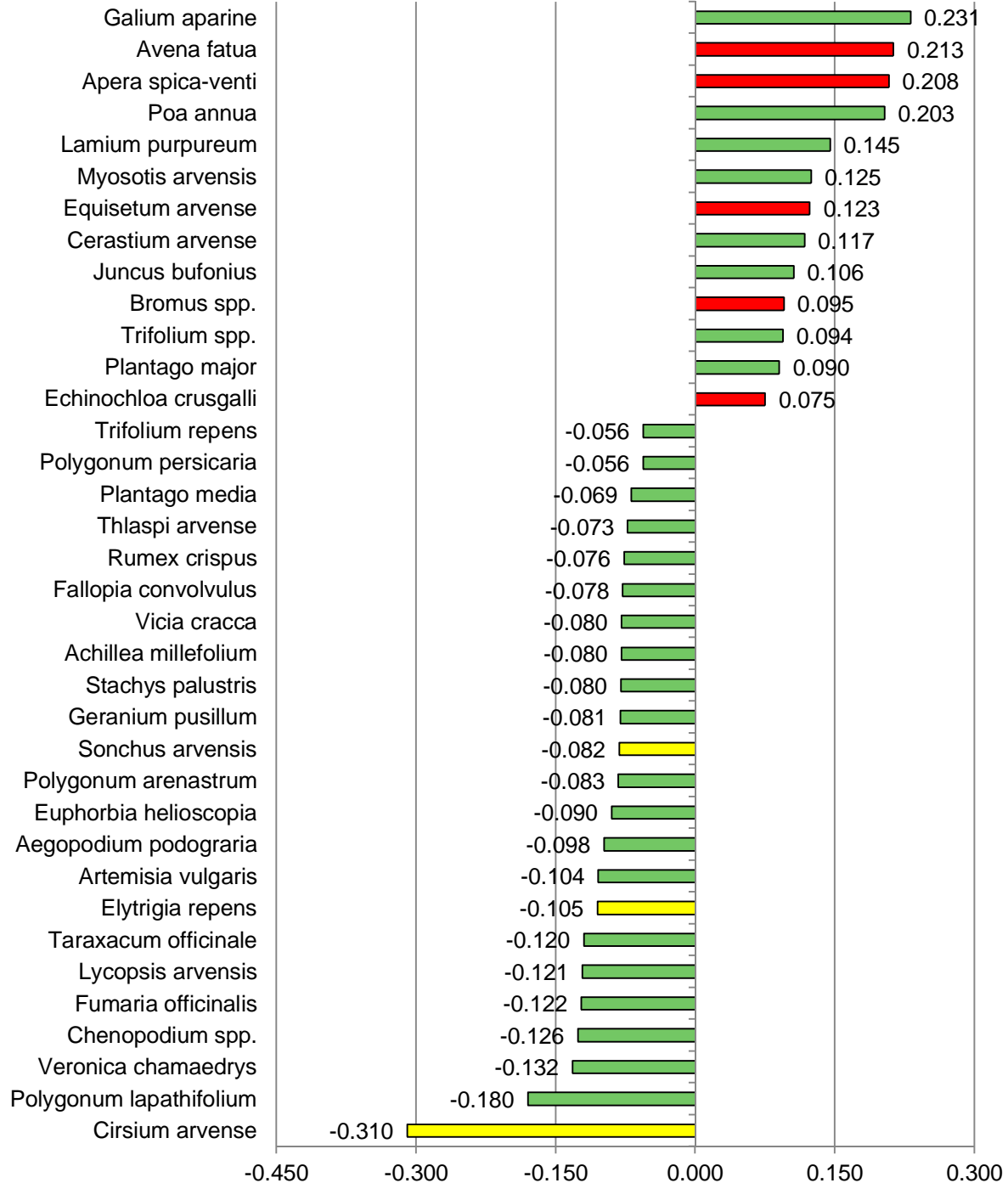
Changes in weed species occurrence, if increase proportion of cereals in crop rotation



Latgale



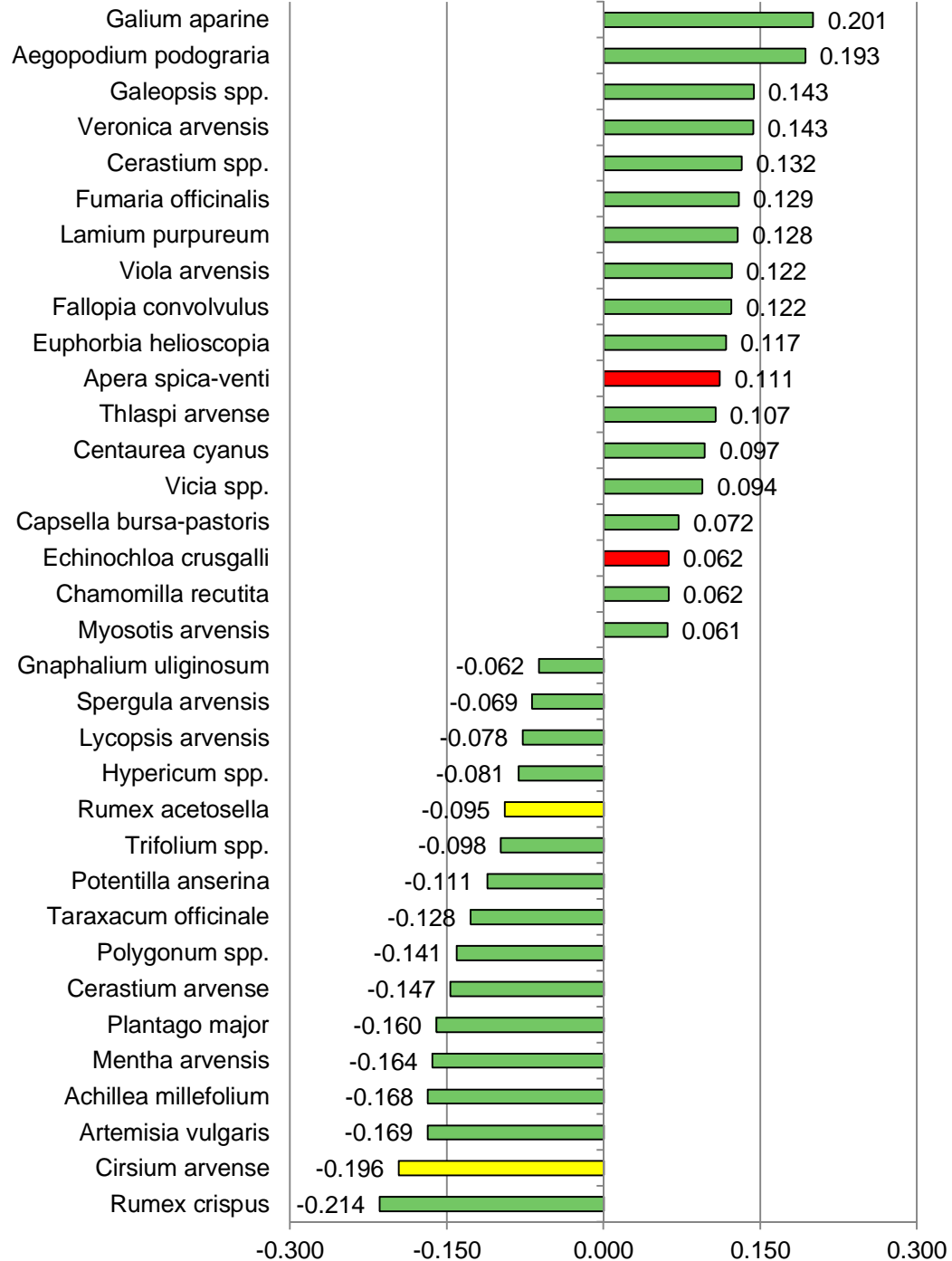
Changes in weed species occurrence, if increase proportion of cereals in crop rotation



Vidzeme



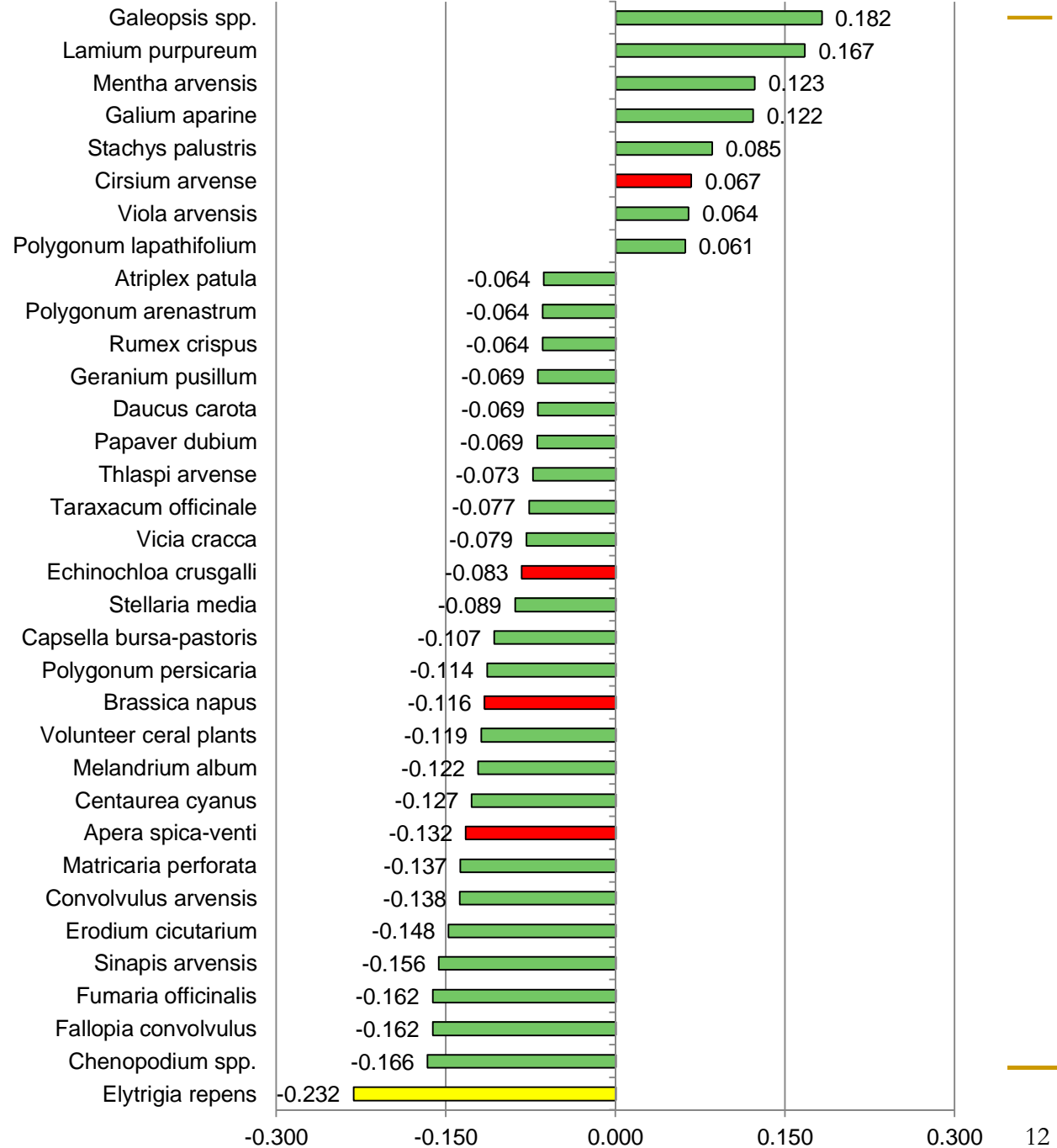
Changes in weed species occurrence, if increase proportion of cereals in crop rotation



Zemgale



Changes in weed species occurrence, if increase proportion of cereals in crop rotation



Conclusions

- 1) The trends for weed species to increase or decrease their occurrence in crop fields with different cereal proportion in the crop rotation differ among the regions of Latvia. That could be explained by different local environmental conditions and field management practices.
- 2) The usefulness of crop rotations as a weed control method requires additional studies, especially with regard to increasing infestation with noxious annual grass weeds.



Avena fatua in the field of winter wheat

Thank you for your attention!



Apera spica-venti in the field of winter wheat



Avena fatua in the field of potatoes