

## Weed distribution in the Italian rice area in relation to agronomic practices and soil characteristics

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### Oral

The Italian rice area is mainly concentrated in the North-West part of the country, in a relatively small territory, characterized by quite homogeneous pedo-climatic traits, which can influence weed composition of rice fields. In the last decade the increase in dry-seeded area compared to traditional water seeding has favored the weeds most adaptable to non-flooding conditions. The objective of the study was to monitor the distribution and the abundance of the main rice weeds through a series of farmer interviews and field surveys, considering almost 1,500 rice fields. Correlations of weed species presence with soil characteristics, geographical area and agronomic practices adopted by the farmers (i.e. soil tillage, crop rotation, seeding method) were explored through descriptive analyses, ANOVAs, PCA, and two-step cluster analysis. The study highlighted that the species of the genus *Echinochloa* were the most common weeds, found on almost 90% of the surveyed sites. Other weeds found on at least one third of the sites were: *Cyperus difformis*, *Heteranthera reniformis*, *Oryza sativa* (weedy rice), and *Alisma plantago-aquatica*. The main factors affecting weed species composition were seeding method and soil texture. The increase of dry seeding caused a shift of the weed community favoring a higher presence of weeds most typical of dry fields, such as *Persicaria maculosa*, *Digitaria sanguinalis* and *Panicum dichotomiflorum*. The PCA highlighted that weed density was negatively correlated with sand content of the soil, in particular for species found in flooded conditions; in fact, in these areas the seeding in flooded fields was the most common method. It was also found that weeds typical of dry conditions were found in sandy or loamy sand soil where dry seeding was the most common practice. The cluster analysis highlighted that the seeding method was the most important predictor for the cluster formation. Three clusters were created, one characterized by 93% of the sites with seeding in flooded fields and with high presence of weeds typical of flooded conditions (i.e. *H. reniformis*, *Echinochloa* spp., *C. difformis*). Cluster 2 included 74% of the sites with dry seeding and with weeds both of flooded and dry seeding, while cluster 3 comprised 92% of the sites with dry seeding having weeds typical of this environment. The study permitted to have an updated picture of the infestations of rice fields and highlighted that some agronomic practices, i.e. type of seeding, can strongly influence the presence of certain weed species.

**Keywords:** weed community, rice weeds, dry seeding, water seeding