

High Maize Yields in Europe Depend on Herbicides

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Almost all countries within the European Union grow maize. In the 27 EU member states, the area of grain maize and silage maize is about 8 million hectares and 5 million hectares, respectively. The largest maize producers are France, Romania, Germany, Hungary and Italy, where maize is grown on more than 1 million hectares each. A recent Study of 11 maize production regions in the EU revealed that about 30% of the maize hectares are in reduced tillage or no-tillage while organic maize growing is below 3% in all regions [1].

Weeds are controlled with herbicides in all European regions on more than 90% of the maize production area [1]. The maize growing areas in Europe are fertile, rain fed, and warm with large weed seed bank build up. As a result, 50-500 weed seedlings per square meter emerge to compete with the young crop [2]. Maize is sown at a low seed rate (8-10 plants per square meter) and young maize plants are especially intolerant of weed competition. Research in Germany showed a 70% reduction in maize yield when weeds were not controlled [3]. Because of the extensive use of herbicides, maize losses to weeds are only 5% in the EU [4].

Considerable research has been done in Europe regarding the feasibility of substituting mechanical tillage for all or some of the herbicide applications. In general, mechanical tillage was not as effective in removing weeds with weed dry weight being 5 times higher than with herbicides [5]. Less effective weed control means maize yields are lower without herbicides. Research in Italy with mechanical weed control produced maize yields 12.5% lower than chemical spraying [6]. Recent research has also shown that the mechanical operations may damage the maize crops resulting in yield loss. For example, harrowing for weed control covered the crop plants with soil for a few days and reduced maize growth [5]. Mechanical weeding is also much more time consuming than herbicide application. Research in the E.U. estimated that substituting four tillage operations for 2 herbicide applications increased the time needed for weed control by 220% [5].

References

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Weeds in maize



Healthy maize plants in Italy