



# **18<sup>th</sup> European Weed Research Society Symposium**

## **EWRS 2018**

17-21 June 2018  
Ljubljana, Slovenia



**New approaches for  
smarter weed management**

**Book of Abstracts**

[www.ewrs2018.org](http://www.ewrs2018.org)



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**Reduced herbicide use does not increase crop yield loss if compensated by alternative measures**

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INRA, DIJON, France

Herbicide use must be reduced because of environmental and health issues. To evaluate whether weeds and crop yield loss will increase, we collected data on 272 arable cropping systems from Spain and France, from farm surveys, the Biovigilance-Flore network, expert opinion, cropping-system trials, crop advisors and scientists. Each system was simulated over 27 years and 10 weather repetitions, using FlorSys. This process-based model simulates multispecies weed floras and crop canopies in virtual fields from cropping systems and pedoclimate at a daily time-step. Four simulation series were run, 1) starting with a typical regional weed flora, 2) eliminating all herbicides without any other change in management practices. The two series were run again, this time without weeds (series 3 and 4). Comparing series 1 and 2 to respectively 3 and 4 gave the crop yield loss due to weeds in series 1 and 2. Comparing series 1 to 2 quantified the herbicide impact on weeds and crop production. The simulations showed that (1) yield loss increased with increasing weed biomass, and that the weed/crop biomass ratio at crop flowering was the best indicator of the year's yield loss, (2) herbicide use intensity (TFI) was not correlated to either weed infestation or yield loss, because it greatly depended on other management practices, (3) weed biomass and yield loss increased when herbicides were eliminated without any other change in management practices, (4) effects were more visible at the multiannual than the annual scales. Monotonous herbicide-intensive rotations with short crop cover, no plough or winter ploughing and frequent rolling operations were the most sensitive to herbicide suppression. A decision tree predicting yield loss from management practices was built to support farmers and crop advisors when designing cropping systems reconciling low herbicide use and low yield loss.

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