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Analysis of the impact of water shortage on irrigated fruit yields in Spain

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Fruit production is strongly dependent on irrigation water in Spain. In contrast with annual crops, fruit producers are concerned not only with current year yields but also with future years' production or even with the potential loss of a strong investment in the case of death of the plantation. According to climate change predictions, extreme precipitation events – floods and droughts – are likely to increase in the future. This means that there might be a potential demand for hydrological drought insurance among fruit producers.

This study tests whether hydrological drought has effectively affected fruit yields in the last 30 years in Spain. Water management decisions are taken in Spain according to drought indicators, called State Indices, established in the Drought Action Plans in the different river basins in Spain. These indicators are mainly based on reservoir stocks and inflows in regulated sub-basins and on river flows in non-regulated sub-basins. However, in some cases they are also based on ground water stocks and on water transfers between basins depending on the case. We analyze the relationship between the State Indices at their lowest levels and the yields of non-citrus fruit (apples, pears, peaches, apricots, plums and cherries) in the most important producing areas in Spain (Cuenca del Ebro, del Segura, del Júcar y del Guadiana). Preliminary results in some of the regions suggest that hydrological drought has caused some yield decrease, but it has not been so far so strong as to compromise fruit plantations.

Keywords: Hydrological drought, drought indicators, fruit yields, Spain