Ola Lundin, Henrik G. Smith, Maj Rundlöf and Riccardo Bommarco. When ecosystem services interact - crop pollination benefits depend on the level of pest control

Electronic supplementary material. Seed set as a measure of yield

The yield component that we expect both pollinators and seed eating pests to primarily affect in red clover is seed set within the flower-head. Positive and interactive effects of pollination and pest control on inflorescence seed set might when looking at plant seed set however be traded off against reduced inflorescence size (number of flowers per inflorescence) or reduced inflorescence number (number of inflorescences per plant) [1,2].

To address this, we verified in our statistical model (described under Statistical analyses in main text) that neither pollination ($F_{1,8.0} = 0.37, p = 0.56$), pest control ($F_{1,4.0} = 3.79, p = 0.12$) nor any interaction between the two ($F_{1,8.0} = 0.01, p = 0.92$) significantly affected mean log-transformed inflorescence size. We also summed up all inflorescences produced by each plant in the experiment. After excluding two small plants from analyses that produced so few flower-heads that they became outliers in this analysis (including these rendered non-significant differences in flower-head production among all treatments), we found that neither pest control ($F_{1,3.6} = 0, p = 0.95$) nor any interaction between pollination and pest control ($F_{1,7.7} = 0.93, p = 0.37$) affected log-transformed inflorescence number, whereas plants in the high pollination treatment produced on average 9% more inflorescences (mean 98, SD 27) compared to plants in the low pollination treatment (mean 90, SD 23, $F_{1,8.6} = 6.27, p= 0.035$).

As high pollen availability is expected to decrease instead of increase the number of inflorescences a plant produces [1] this counter intuitive result was likely a compensation for the
somewhat higher number of flower-heads cut during the pollination treatments in the ‘high’ pollination sets (mean 26, SD 10, over the four pollination rounds), compared to the ‘low’ pollination treatments (mean 16, SD 9, over the two pollination rounds). The difference in flower-head production between pollination treatments did not affect the conclusions and we are confident to translate our results of combined effects of pollination and pest control into whole-plant effects.

References
