

Ecosystem Services

Pollination as an Ecosystem Service to Agriculture

Many insect pollinators provide an ecosystem service by pollinating crops worldwide. Insect pollination has been shown to increase or stabilize yields of many fruit, vegetable, oil, seed and nut crops (Klein et al., 2007, Free, 1993). Global cultivation of insect-pollinated crops has expanded since the 1960s, leading to about a 300% increase in demand for pollination services (Aizen and Harder, 2009). The global economic value of this pollination service was estimated (in 2005) to be US\$215 billion or 9.5% of global food production value (Gallai et al., 2009).

Honey bees are managed for both honey production and crop pollination services (Aizen and Harder, 2009). While for certain crops (e.g. almonds) honey bees pollination is crucial, for many others honey bee pollination alone is often unable to deliver sufficient pollen at the appropriate time and place (Garibaldi et al., 2011). Natural habitats support a range of wild pollinators that can increase the yield of nearby crops through provision of a resilient and complementary pollination service (Garibaldi et al., 2011, Hoehn et al., 2008). Therefore a diversity of pollinators including honey bees will contribute to sustainable crop pollination.

Given the multiple threats facing pollinators, any reliance on a single species for pollination services to agriculture is risky. If demand for insect-dependent crops rises and pollinator numbers persistently falls then, without technological or economic responses, shortages of these crops may follow (Klein et al., 2007, Aizen and Harder, 2009).

In a global economy, regional losses of pollinators that alter delivery of pollination services to high-value crops are likely to have ramifications for geographically distant markets. Human responses such as developing new suppliers may simply transfer the environmental impacts elsewhere in the globe. Aside from the monetary impacts, and the possible consequences for the socio-economics of human societies, loss of pollination may also affect human nutrition and health.



Sorting coffee beans



Soft fruit farm



Bumblebee on a sunflower



Fruit Orchards