INSECT POLLINATORS SUCH AS BEES AND FLIES CAN TRIPLE THE COMMERCIAL VALUE OF CHRISTMAS HOLLY AND MISTLETOE

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Holly and mistletoe are two seasonal crops that play a culturally important role as symbols of Christmas across the world, though both also have pre-Christian pagan connotations. Now for the first time the role of insect pollinators in determining the commercial value of these plants has been investigated, using sales records going back over the last eleven years from Britain's largest annual auction of holly and mistletoe, held every year in Worcestershire.

Analysis of the sales records of Nick Champion Auctions in Tenbury Wells shows that insect pollination raises the sale price of these crops by on average two to three times. This is because holly and mistletoe with berries is more sought after than material without berries, with wholesale buyers paying higher prices at auction. These berries in turn are the result of pollination by insects such as flies and bees: both holly and mistletoe are 100% dependent on insect pollination due to their having separate male and female plants.

There is some annual variation to the prices, and in years where berries are scarce (possibly due to low insect numbers) the price difference can be four-fold.

Due to concerns about pollinator declines and food security there is huge interest in the role of bees and other insects in supporting agriculture, and how we can value that role. However we believe that this is the first study showing that insect pollinators play a large part in determining the value of culturally symbolic, non-food crops. Almost all of the economic valuations of insect pollination to agriculture have focused on food crops such as beans, apples, cocoa, coffee, and so forth. Very little is known about how the value of non-food crops (fibres, construction materials, pharmaceuticals, ornamentals, etc.) is enhanced by insect pollination. This is an area where much more research is required.

(A) Mistletoe and (B) holly berries growing on female plants *in situ*, and the same species packaged displayed for retail (C & D) Photos by J. Ollerton.