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1 Appendix S1 Source of information for the estimated annual nectar and pollen production for  
2 land cover types

3 Full canopy nectar production is estimated from the honey potential class from Crane (1975)  
4 or expert knowledge using relative comparison of potential productions. Final nectar  
5 production (in kg/ha/yr) for each land cover class is the full canopy nectar production times  
6 the proportion cover  $p$ . Pollen production categories were assigned from expert knowledge.  
7 Full canopy pollen production was then estimated from pollen production category using a  
8 scale assumed to be 20–250 kg/ha/yr, based on findings from Denisow (2011). Final pollen  
9 production (in kg/ha/yr) for land cover class is the full canopy pollen production times the  
10 proportion cover  $p$  times pollen quality  $q$ . The pollen quality was based on expert knowledge,  
11 supported by data on protein content where available.

12 TABLE S1. Estimated annual nectar and pollen production for land cover classes.

Land cover	Indicative list of species based on field observations	A. Honey potential class	B. <i>NPs</i> (kg.ha <sup>-1</sup> .year <sup>-1</sup> )	C. Pollen production category	D. <i>PPs</i> (kg.ha <sup>-1</sup> .year <sup>-1</sup> )	E. % cover ( <i>p</i> )	F. Pollen quality ( <i>q</i> )	Supporting information for columns A-F
Mixed non-native shrubland	Black locust, eucalyptus ( <i>spp.</i> ), hawthorn ( <i>Crataegus laevigata</i> ), citrus ( <i>sp.</i> ), oak, willows ( <i>salix sp.</i> ), sycamore ( <i>Acer pseudoplatanus</i> ), honeysuckle ( <i>Leycesteria Formosa</i> ), broom ( <i>Cytisus scoparius</i> ), gorse ( <i>Ulex europaeus</i> )	4–5	150	high	150	40%	0.7	A-B. Crane (1975) C-D. Barry Foster (pers. Com.) E. Field obs. F. Barry Foster (pers. Com.)
Gorse/broom	Gorse ( <i>Ulex europaeus</i> ), scotch broom ( <i>Cytisus</i>	1	4	Medium-high	125	100%	0.5	A-B. Crane (1975) C-D. Barry Foster (pers. Com.) E. Land Cover Database (Landcare Research Ltd 2012).

	<i>scoparius</i> )							We assumed 95% cover from gorse, 5% from scotch broom. F. Sandrey (1985)
mānuka/kānuka	Mānuka ( <i>Leptospermum scoparium</i> , kānuka ( <i>Kunzea ericoides</i> )	3–4	125	low	25	100%	0.3	A-B. Crane (1975) and Somerville (2001) C-D. Barry Foster (pers. Com.) E. Land Cover Database (Landcare Research Ltd 2012) F. Crane (1984)
Indigenous forest	from NVS and method in appendix S2	4–5	200	Medium-high	125	10%	0.8	A-B. Linda Newstrom-Lloyd, (pers. Comm.) C-D. Barry Foster (pers. Comm.) E. NVS and method in appendix S2 F. Linda Newstrom-Lloyd, (pers. Comm.)
broadleaved indigenous shrubland	from NVS and method in appendix S2	4–5	200	medium	100	20%	0.7	A-B. Linda Newstrom-Lloyd, (pers. Comm.) C-D. Barry Foster (pers. Comm.) E. NVS and method in appendix S2 F. Linda Newstrom-Lloyd, (pers. Comm.)
Woody roadsides	Hawthorne ( <i>Crataegus monogyna</i> ), tree Lucerne ( <i>Cytisus proliferus</i> ), privet ( <i>Ligustrum sinense</i> ), poplar, willow ( <i>Salix</i>	5–6	500	medium	100	5%	0.7	A-B. Crane (1975) and Linda Newstrom-Lloyd, (pers. Comm.) C-D. Barry Foster (pers. Comm.) E. Field observation F. Linda Newstrom-Lloyd, (pers. Comm.)

	<i>sp</i> ), paulownia, daisy ( <i>Bellis perennis</i> ), buttercup ( <i>Ranunculus sp.</i> ), viper ( <i>echium vulgare</i> )							
Other non-native woody vegetation	Macrocarpa ( <i>Cupressus macrocarpa</i> , <i>Cupressus leylandii</i> ), pine ( <i>pinus radiata</i> ), eucalyptus, poplar ( <i>populus sp.</i> ), willow ( <i>Salix sp</i> )	4–5	250	low-medium	100	10%	0.7	A-B. Crane (1975) C-D. Barry Foster (pers. Comm.) E. Field observation F. Linda Newstrom-Lloyd, (pers. Comm.)
Deciduous hardwoods and riparian shrubs	Willows ( <i>Salix spp</i> ), poplars ( <i>populus sp.</i> ) tree Lucerne ( <i>Cytisus proliferus</i> , gorse ( <i>Ulex europaeus</i> ), elderberry ( <i>Sambucus nigra</i> ), barberry ( <i>Berberis sp</i> ), eucalyptus,	4–5	150	high	150	40%	0.7	A-B. Crane (1975) and Linda Newstrom-Lloyd, (pers. Comm.) C-D. Barry Foster (pers. Comm.) E. Field observation F. Linda Newstrom-Lloyd, (pers. Comm.) and Panchev et al (2011)

	hawthorn ( <i>Crataegus laevigata</i> ), blackberry ( <i>Rubus fruticosus</i> )							
Low producing grassland	Pasture grasses used for sheep and beef include: White clover ( <i>Trifolium repens</i> ), browntop ( <i>Agrostis tenuis</i> ), rye grass ( <i>Lolium perenne</i> )	6	200	Low-medium	65	5%	0.9	<p>A-B. Baude et al. (2016): White clover (<i>trifolium repens</i>) 800 kg/ha/yr. Improved grassland: 51 kg/ha/yr. Since management is preventing flowering of clover, we've used a quarter of its value for managed pastures.</p> <p>C-D. Denisow (2012) (Daily pollen production for <i>trifolium repens</i> is low: 0.007 kg/ha. Considering a long flowering period of 90 days gives 0.6 kg/ha/yr). This is comparable to Hicks et al (2017) who found 0.38 kg/ha/year for white clover. Other species present in pastures like chicory (<i>cichorium intybus</i>), dandelion (<i>taraxacum officinale</i>), plantain (<i>plantago lanceolata</i>), rumex (<i>rumex crispus</i>) yield between 0.5-2 kg/ha/day. We assumed 65 kg/ha/year.</p> <p>E. Nicholas et al. (2004) found a 5% proportion of white clover in hill country, low-producing pastures, but grazing pressure lowers the proportion of available flowers (see column B).</p> <p>F. <i>trifolium repens</i> (25% Somerville, 2001, and 35% in Hicks et al (2017)). Red clover <i>T. pratense</i> 41% (Hicks</p>

								et al 2017). Dandelion ( <i>taraxacum officinale</i> ) 19%.
High producing grassland	Pasture grasses used for dairy farming include: Rye grass ( <i>Lolium perenne</i> ), white clover ( <i>Trifolium repens</i> ), chicory ( <i>cichorium intybus</i> ), dandelion ( <i>taraxacum officinale</i> ), plantain ( <i>plantago lanceolata</i> ), rumex ( <i>rumex crispus</i> )	6	200	Low-medium	65	10%	0.9	<p>A-B. Baude et al. (2016): White clover (<i>trifolium repens</i>) 800 kg/ha/yr. Improved grassland: 51 kg/ha/yr. Since management is preventing flowering of clover, we've used a quarter of its value for managed pastures.</p> <p>C-D. Denisow (2012) (Daily pollen production for <i>trifolium repens</i> is low: 0.007 kg/ha. Considering a long flowering period of 90 days gives 0.6 kg/ha/yr). This is comparable to Hicks et al (2016) who found 0.38 kg/ha/year for white clover. Other species present in pastures like chicory (<i>cichorium intybus</i>), dandelion (<i>taraxacum officinale</i>), plantain (<i>plantago lanceolata</i>), rumex (<i>rumex crispus</i>) yield between 0.5-1 kg/ha/day. We assumed 65 kg/ha/year.</p> <p>E. Tozer et al. (2014) found around 10% proportion of white clover in dairy, high-producing pastures with highly variable broadleaved weeds (dandelion, rumex) and sown herbs (chicory, plantain).</p> <p>F. Protein content: White clover (<i>trifolium repens</i>): 25% (Somerville, 2001), 35% (Hicks et al, 2017). Red clover <i>T. pratense</i> 41% (Hicks et al 2017). Dandelion (<i>taraxacum officinale</i>) 19% (Hicks et al 2017).</p>

Urban parkland/open space	a quarter of urban	5–6	500	Very high	250	2.5%	0.7	A-B. Crane (1975) and Linda Newstrom-Lloyd, (pers. Comm.) C-D. Barry Foster (pers. Comm.). High range value from Denisow (2012). E. Field observation F. Linda Newstrom-Lloyd, (pers. Comm.)
Urban areas	Mixture of exotic ornamental and melliferous fruit tree species, and native species. Observed species include: apple ( <i>malus</i> sp.), lavender ( <i>lavendula</i> ), camellia sp., rose ( <i>rosa</i> sp.), coprosma sp., hebe sp.	5–6	500	Very high	250	10%	0.7	A-B. Crane (1975) and Linda Newstrom-Lloyd, (pers. Comm.) C-D. Barry Foster (pers. Comm.) High range value from Denisow (2012). E. Field observation F. Linda Newstrom-Lloyd, (pers. Comm.)
Cropland or horticulture	Includes peas ( <i>Pisum sativum</i> ), rape ( <i>Brassica napus</i> ), turnip ( <i>Brassica rapa</i> ), vineyards ( <i>Vitis vinifera</i> ), apple		7		0			A-B. Baude et al. (2016) C-D. Unknown E. Unknown F. Unknown

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	(malus sp.)							
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