Fig. 2

Categories used to describe **breeding** (flower morphologies and breeding systems):
androecious = individuals produce only male flowers
andro-dioecious = some individuals with male and female gametes on the same individual and others with male flowers only
andro-monoecious = bisexual and male flowers on the same individual
buzz-pollination = usually with porose anthers and bees must buzz (sonicate) the flowers with their flight muscles to loosen the pollen
dichogamous (dichogamy) = bisexual flower, but female function and male function are separated in time
dioecious = male and female gametes on different individuals
distylous (distyly) = species with two morphologically different flower types that are self-incompatible, but cross-compatible
gynoecious = individuals produce only female flowers
gyno-dioecious = some individuals with male and female gametes on the same individual and others with female flowers only
hermaphrodite = bisexual flowers
monoecious = male and female gametes are produced by separate flowers, but on the same individual
polygamous = hermaphrodite, male and female flowers on the same individual
self-compatible = reproduction possible with self pollen

Categories used for the breeding systems allowing for **pollination without visitors** (mechanism of pollination involved when setting fruits or seeds without animal pollination):
apomixis = seed development without fertilization
cleistogamous (cleistogamy) = passive self-pollination without flower opening
passive self-pollination = reproduction with own pollen not transferred by wind, animals or any other transfer agents
parthenocarpy = seedless fruit development without fertilization
self-incompatible = reproduction only with foreign pollen (allo pollen)
wind pollination = reproduction with airborne pollen transferred by wind

Pollinators and visitors = all animal groups (mainly insects, typically bees) which are mentioned as possible pollinators. Some will prove to be only floral visitors; the true pollinating species or animal groups are highlighted in bold: species for which at least 80% of their single flower visits result in a fruit, or species that lead to higher fruit and seed quality and quantity when caged or abundant in natural communities in contrast to fruit and seed quality and quantity when flowers are protected from all visitors;
Positive impact by animal pollination = evidence of increased production, that is defined as increased fruit set, fruit weight and/or quality, seed number and/or seed quality, and/or increased pollen deposition (an indirect measure) for at least one variety per crop. Crops for which only indirect evidence of animal pollination could be found are indicated with 'indirect'. Following categories are used to classify the need of animal-mediated pollination:
essential = pollinators essential for most varieties (production reduction by ≥ 90% comparing experiments with and without animal pollinators)
great = great production increase/ animal pollinators are strongly needed (40 - <90% reduction)
modest = modest production increase/ animal pollinators are clearly beneficial (10 - <40% reduction)
little = little production increase/ some evidence suggests that animal pollinators are beneficial (>0 - <10% reduction)
no increase = no production increase with animal-mediated pollination
unknown = empirical studies are missing
Leading crop, commodity = identification of the leading single and commodity crops on the word market

Some crop species or varieties greatly differ in their need for animal pollination. To avoid overestimation in such cases, we classified the crops in the lower category.
For citing original studies summarized in review articles we used an 'in' in front of the reference, e.g. in Free 1993. Original articles are cited without the 'in', e.g. Klein *et al.* 2003.

Crop species	Crop name	Breeding	Pollination without visitors	Pollinators and visitors	Positive impact by animal pollination	Leading crop, commodity
Vegetable crops						
Abelmoschus esculentus	Okra, Gumbo	hermaphrodite, self-compatible	passive self-pollination	honey bees (***Apis cerana***), solitary bees (***Halictus* spp.**)	**modest** in Crane 1991; Hamon 1991; in Free 1993	yes
Cajanus cajan	Pigeon pea, Cajan pea, Congo bean	hermaphrodite, self-compatible	passive self-pollination	honey bees, solitary bees (*Megachile* sp., *Xylocopa* sp., *Chalicodoma* sp.)	**little** James *et al.* 1989; Grewal *et al.* 1990; in Free 1993; in Heard 1999	no
Canavalia ensiformis, C. gladiata, C. marittima, C. microcarpa, C. virosa	Jack bean, Horse bean, Sword bean	hermaphrodite, self-compatible	passive self-pollination, wind pollination	solitary bees (*Xylocopa confusa*)	**modest** in Free 1993; Gross 1993 for *C. rosea*	commodity, pulses NES
Capsicum annuum, C. frutescens	Chile pepper, Red pepper, Bell pepper, Green pepper	hermaphrodite, self-compatible	wind- or insect-mediated shaking necessary for self-pollination, passive self-pollination	honey bees, stinglee bees (***Melipona favosa, M. subnitida***), bumble bees (***Bombus impatiens, B. terrestris***), solitary bees (***Osmia cornifrons, Megachile rotundata***), hover flies (***Eristalis tenax***)	**little** Jarlan *et al.* 1997a,b; Meisels & Chiasson 1997; Raw 2000; Dag & Kammer 2001; Ercan & Onus 2003; De Oliveira Cruz *et al.* 2005; in Slaa *et al.* 2006 pollinators important in greenhouses to increase fruit weight, but less in open fields	yes
Chenopodium quinoa	Quinoa	hermaphrodite, andro-monoecious	passive self-pollination, wind pollination	flies	**no increase** Simmonds 1965; Simmonds 1971	no
Cicer arietinum	Chickpea, Gram, Garbanzo bean	hermaphrodite, self-compatible	passive self-pollination	honey bees, solitary bees	**no increase** in Free 1993; Abbo *et al.* 2003	yes

Citrullus lanatus	Watermelon	mostly monoecious, self-compatible		honey bees (***Apis cerana***), bumble bees (***Bombus californicus***, ***B. impatiens, B. vosnesenskii***) solitary bees (***Halictus tripartitus*****,** ***Peponapis pruinosa***), species effective in pollen deposition are listed in Kremen *et al.* 2002	**essential** in Free 1993; Stanghellini *et al.* 1997; Stanghellini *et al.* 1998; in Delaplane & Mayer 2000; Kremen *et al.* 2002; Stanghellini *et al.* 2002; Kremen *et al.* 2004; Njoroge *et al*. 2004	yes
Cucumis melo	Cantaloupe, Melon	monoecious or andro-monoecious, self-compatible	passive self-pollination possible only in andro-monoecious varieties	honey bees (***Apis mellifera***), bumble bees ***Bombus*** sp., solitary bees (***Ceratina*** sp.)	**essential** in Free 1993; Norden 1985; Kato & Nogueira-Couto 2002; Valantin-Morison *et al*. 2006	yes
Cucumis sativus	Cucumber, Gherkin	monoecious or andro-monoecious, self-compatible	passive self-pollination possible only in andro-monoecious varieties	honey bees (***Apis mellifera***), bumble bees (***Bombus impatiens),*** solitary bees (***Melissodes*** sp.)	**great** in Free 1993; Stanghellini *et al*. 1997; Gingras *et al.* 1999; Stanghellini *et al.* 2002; in Slaa *et al.* 2006 parthenocarpic gynoecious varieties of slicing cucumber grown in greenhouses for which insect pollinators can be detrimental to fruit quality	yes
Cucurbita maxima, C. mixta, C. moschata, C. pepo	Pumpkin, Squash, Gourd, Marrow, Zucchini	monoecious, self-compatible		honey bees (***Apis cerana, A. mellifera***), stingless bees (***Scaptotrigona depilis***), solitary bees, (***Pithitis smaragdula***, ***Peponapis limitaris***, ***P. pruinosa***, ***Xenoglossa*** sp**.**, ***Ceratina*** sp**.)**	**essential** Norden 1985; in Free 1993; Nepi & Paccini 1993; in Delaplane & Mayer 2000; Canto-Aguilar & Parra-Tabla 2000; Ashworth & Galetto 2001; Cardoso 2003 (higher germination rate and vigor with natural pollination compared to hand pollination); Fuchs & Müller 2004	yes
Cyamopsis tetragonoloba	Guar bean, Goa bean	hermaphrodite	passive self-pollination	honey bees	**little** in Free 1993	commodity, pulses NES
Dolichos biflorus, D. lablab	Hyacinth bean, Horse-gram, Lablab	hermaphrodite	passive self-pollination	honey bees	**modest** Garcia Neto *et al*. 1988; in Free 1993	commodity, pulses NES
Fagopyrum esculentum	Buckwheat	hermaphrodite, self-incompatible (distylous)	some wind-pollination	honey bees	**great** in Free 1993; Björkman 1995a,b; Campbell 1997; Goodman *et al.* 2001	no
Lens esculenta	Lentils	hermaphrodite, self-compatible	passive self-pollination	bees	**no increase** Ladizinsky *et al*. 1984; Erskine & Muehlbauer 1991; in Free 1993; Richards 2001	no
Lycopersicon esculentum	Tomato	hermaphrodite, self-compatible, buzz-pollination	wind- or insect-mediated shaking necessary for self-	honey bees (***Apis mellifera***), stingless bees	**little** in Free 1993; du Toit 1994; Asada & Ono 1996; in	yes

			pollination, parthenocarpy	(***Melipona quadrifasciata***, ***Nannotrigona perliampoides***), bumble bees (***Bombus hypnorum*, *B. (Thoraco-bombus) pascuorum***, ***B. sonorus, B. terrestris, B. vosnesenskii),*** solitary bees ***(Amegilla chlorocyanea, A. (Zonamegilla) holmesi, Xylocopa*** ssp.)	Delaplane & Mayer 2000; Hogendoorn *et al.* 2000; in Westerkamp & Gottsberger 2000; Morandin *et al.* 2001; Cauich *et al.* 2004; Higo *et al.* 2004; Greenleaf 2005; Bell *et al.* 2006; Hagendoorn *et al.* 2006; Greenleaf & Kremen 2006a; in Slaa *et al.* 2006 pollinators important in greenhouses, but less in open fields except for varieties with exserted stigmas	
Mucuna pruriens (syn. *Stizolobium* spp.)	Velvet bean	hermaphrodite, self-compatible	passive self-pollination	bats	**unknown** in Free 1993; Hennessy 1991	commodity, pulses NES
Phaseolus spp. (P. vulgaris, P. lunatus, P. angularis, P. aureus, P. mungo, P. coccineus, P. calcaratus, P. aconitifolius, P. acutifolius	Kidney bean, Haricot bean, Lima bean, Adzuki bean, Mungo bean, String bean	hermaphrodite, self-compatible	passive self-pollination	honey bees (*Apis dorsata*, *Apis florea*), bumble bees, thrips	**little** Du Toit 1990; in Crane 1991; in Roubik 1995; in Carrek & Williams 1998; Ibarra-Perez *et al.* 1999	yes
Pisum sativum, P. arvense	Garden pea, Field pea	hermaphrodite, self-compatible	passive self-pollination	bumble bees, solitary bees (*Eucera dalmatica, Xylocopa* ssp.)	**no increase** Gritton 1980; in Free 1993, Franklin *et al.* 2000; Mcphee 2003	yes
Psophocarpus tetragonolobus	Winged bean, Goa bean	hermaphrodite, dichogamous, self-incompatible	passive self-pollination	solitary bees (*Xylocopa* spp.)	**unknown** in Free 1993	commodity, pulses NES
Solanum melongena	Eggplant, Aubergine	hermaphrodite, self-compatible, buzz-pollination	wind- or insect-mediated shaking necessary for self-pollination, passive self-pollination	honey bees (***Apis mellifera***), bumble bees, solitary bees	**modest** in Free 1993 pollinators important in greenhouses, but less in open fields	Yes
Vigna unguiculata	Cowpea, Blackeye pea, Blackeye bean	hermaphrodite, self-compatible	passive self-pollination	honey bees, bumble bees	**little** Vaz *et al.* 1998	Yes
Vigna subterranea (syn. *Voandzeia subterranea*)	Bambara beans, Bambara groundnuts, Earth pea	hermaphrodite, self-compatible	passive self-pollination	ants (indirect effect on fruit set), bees mentioned in Roubik (1995, no source given)	**little (indirect)** in Free 1993, ants seem to have direct and indirect positive effects on fruit set (they may soften the soil and make penetration of fertilized flowers easier), see Doku 1968, but also Doku & Karikari 1971 cited in Free 1993; Roubik 1995	Yes

Fruit crops						
Actinidia deliciosa	Kiwifruit	dioecious	wind-pollination, but few, small fruits of low quality	honey bees (***Apis mellifera***), bumble bees (***Bombus terrestris***), solitary bees	**essential** Costa *et al.* 1993; in Free 1993; Vaissière *et al.* 1996; Awasthi & Kumar 1997; Gonzalez *et al.* 1998; in Delaplane & Mayer 2000; Howpage *et al.* 2001	No
Annona squamosa	Atemoya, Cherimoya, Custard apple	hermaphrodite	passive self-pollination, hand pollination	nitidulid beetles (***Carpophilus hemipterus, Carpophilus mutilatus***)	**essential** Galon *et al.* 1982; Gazit *et al.* 1982; George *et al.* 1989; George *et al.* 1992; Free 1993; Nadel & Pena 1994; Peña *et al*. 1999; Kill & da Costa 2003; Blanche & Cunningham 2005	commodity, fresh tropical fruits NES
Arbutus unedo	Tree-strawberry	hermaphrodite, self-compatible	wind-mediated shaking can lead to self-pollination	honey bees (*Apis mellifera*), bumble bees (*Bombus terrestris*)	**modest (indirect)** Sealy 1949; Hagerup 1957; Herrera *et al.* 1984; Rasmont *et al.* 2005	commodity, fresh fruits NES
Artocarpus altilis (syns. *A. incisus, A. incircus, A. incisa, A. communis*)	Breadfruit	monoecious, dichogamous	parthenocarpy in seedless varieties, wind pollination	stingless bees	**unknown** Morton 1987; Hasan & Razak 1992; in Free 1993; Ragone 1997; in Heard 1999	commodity, fresh tropical fruits NES
Artocarpus heterophyllus (syns. *A. integrifolius, A. integrifolia)*	Jackfruit	monoecious, dichogamous	parthenocarpy, wind pollination	stingless bees, flies and moths as flower visitors	**unknown** Moncur 1985; Morton 1987; in Heard 1999; Sakai & Kato 2000; Devy & Davidar 2003 insect-assisted wind pollination hypothesized by Brantjes 1981	commodity, fresh tropical fruits NES
Asimina triloba	Pawpaw, Indiana banana	hermaphrodite, self-incompatible		carrion flies and dung flies	**essential** Willson & Schemske 1980; Gottsberger 1999; Pomper *et al*. 2003	commodity, fresh fruits NES
Averrhoa carambola	Carambola, Starfruit	hermaphrodite, distylous, self-incompatible	passive self-pollination	honey bees (***Apis cerana***), stingless bees (***Trigona thoracica***)	**great** in Free 1993; in Heard 1999; in Richards 2001	commodity, fresh tropical fruits NES
Carica papaya	Papaya	dioecious, monoecious, hermaphrodite, self-compatible	passive self-pollination, wind pollination, parthenocarpy	honey bees, thrips, large sphinx, hummingbirds, moths, butterflies	**little** in Free 1993; Jindal & Sharma 1997; in Westerkamp & Gottsberger 2000	Yes
Citrus aurantifolia, C. aurantium, C. bergamia, C. grandis, C. limetta, C. limon, C. maxima, C. medica (var. *cedrata*), *C. myrtifolia, C. paradisi, C. reticulata,*	Bergamot, Chinotto, Citron, Clementine Grapefruit, Kumquat, Lemmon, Lime, Manderine, Orange, Pomelo Tangerine	hermaphrodite (most species); variable level of self-compatibility depending on species and varieties	variable passive self-pollination and parthenocarpy differs greatly among species and varieties	honey bees (***Apis cerana***, ***A. mellifera***), bumble bees (***Bombus*** sp.)	**little*[1]** in Crane 1991; in Free 1993; Bhatia *et al.* 1995; in Sharma & Jindal 1997; Wallace & Lee 1999; Sanford 2003; Chacoff 2007; Chacoff & Aizen 2006	Yes

C. sinensis, C. unshiu, Fortunella japonica						
Chrysophyllum cainito (syn. *Achras caimito*)	Star apple, Cainito	hermaphrodite		bats, insects	**little (indirect**) Morton 1987; Degen *et al.* 2001	commodity, fresh tropical fruits NES
Crataegus azarolus (syn. *C. ruscionensis)*	Azarole, Azzeruolo	hermaphrodite, self-compatible	apomixis, but initiation requires pollination	honey bees, midges	**little (indirect**) Phipps 2003; Dönmez 2004	commodity, fresh fruits NES
Dimocarpus longan (syn. *Euphoria longan, Euphoria longana, Nephelium longana*)	Longan, Lungan	polygamous	passive self-pollination, wind-pollination	honey bees (*Apis mellifera*), stingless bees (***Trigona*** spp.)	**little** in Heard 1999; Liu & Ma 2001; Blanche *et al.* 2006b	commodity, fresh tropical fruits NES
Diospyros kaki; *D. virginiana*	Persimmon	monoecious, dioecious, rarely polygamous	variable level of parthenocarpy among varieties	honey bees (***Apis cerana, A. mellifera***), bumble bees, solitary bees	**little** Miura 1982; in Crane 1991; Mehta & Kashyap 1997	no
Durio zibethinus	Durian	hermaphrodite, monoecious, mainly self-incompatible		honey bees (*Apis dorsata*), bats (*Eoncyteris spelaea*), birds	**great** Morton 1987; Salakpetch *et al.* 1992; George *et al.* 1994; Yaacob & Subhadrabandhu 1995; Husin & Abidin 1998; Lim & Luders 1998; in Weterkamp & Gottsberger 2000	commodity, fresh tropical fruits NES
Eriobotrya japonica (syn. *Mespilus japonicus*)	Loquat, Japanese plum, Japanese medlar	hermaphrodite, self-incompatible	passive self-pollination	honey bees (***Apis cerana***), bumble bees	**great** in Khan *et al.* 1986, Morton 1987; in Crane 1991; in Free 1993; in Sharma & Jindal 1997	commodity, fresh fruits NES
Feijoa sellowiana	Feijoa	hermaphrodite, varying level of self-incompatibility among varieties	passive self-pollination, wind pollination	birds (***Turdus merula*, *Acridotheres tristis***), honey bees, honey bees	**great** Schroeder 1953; Stewart 1984, 1989; Patterson 1990; in Free 1993 (vary among varieties); Ducroquet & Hickel 1997; Degenhard *et al.* 2001	commodity, fresh tropical fruits NES
Ficus carica	Fig	gyno-dioecious, monoecious	variable level of parthenocarpy among varieties	wasp ***(Blastophaga psenes)***	**modest** in Free 1993; in Westerkamp & Gottsberger 2000	no
Fragaria ssp.	Strawberry	hermaphrodite (most varieties), self-compatible	passive self-pollination, little wind pollination	honey bees (***Apis mellifera***), stingless bees (***Trigona angusula, T. (Tetragonula) minangkabau*, *Nannotrigona testaceicornis***), bumble bees, solitary bees (***Osmia cornuta***), hover flies	**modest** Maeta *et al.* 1992; Chagnon *et al.* 1993; in Free 1993; Kakutani *et al.* 1993; Zebrowska 1998; in Delaplane& Mayer 2000; Malagodi-Braga & Kleinert 2004	no
Litchi chinensis	Litchi, Lychee	andro-monoecious,	little self-pollination, wind	honey bees (***Apis*** sp.), flies	**little** in Free 1993; Bhatia *et al*.	commodity, fresh fruits NES

		self-compatible	pollination		1995; Stern & Gazit 1996; in Sharma & Jindal 1997	
Malus domestica	Apple	hermaphrodite, mainly self-incompatible	passive self-pollination, parthenocarpy in some varieties	honey bees (***Apis cerana***, ***A. mellifera***), bumble bees (***Bombus*** sp., solitary bees (*Andrena* sp., *Anthophora*) sp., (***Osmia cornifrons***, ***O. lignaria propinqua, O. rufa***), hover flies (***Eristalis cerealis, E. tenax)***	**great** in Crane 1991; in Free 1993; Sekita & Amada 1993; Fourez 1995; Batra 1998; in Delaplane & Mayer 2000; in Westerkamp & Gottsberger 2000; Vicens & Bosch 2000; Kron *et al.* 2001; Sekita 2001; Stern *et al.* 2001; Thomson & Goodell 2001; Wei *et al.* 2002; in Soltész 2003; Ladurner *et al*. 2004; Sharma *et al.* 2004	yes
Mammea americana (syn. *Mamea americana*)	Mammee	andro-dioecious	passive self-pollination	bees	**modest (indirect**) Morton 1987; Roubik 1995; Dunthorn 2004	commodity, fresh tropical fruits NES
Mangifera indica	Mango	andro-monoecious, variable self-compatibility among varieties	passive self-pollination, wind pollination	honey bees (**Apis** sp.), stingless bees (***Trigona*** sp.), flies, ants, wasps	**great** in Free 1993; du Toit 1994; Bhatia *et al.* 1995; Dag *et al.* 2001	yes
Manikara zapotilla (syn. *Manikara zapota*, *Achras sapota*)	Sapodilla	hermaphrodite, largely self-incompatible		Thrips (***Thrips hawaiiensis***, ***Haplothrips (Haplothrips) tenuipennis***)	e**ssential** Piatos & Knight 1975; Reddi 1989; Mickelbart 1996	commodity, fresh tropical fruits NES
Mespilus germanica	Medlar	hermaphrodite, self-compatible	passive self-pollination, parthenocarpy	honey bees (*Apis mellifera*)	**unknown** Reiter 1947; Phipps 2003	commodity, fresh fruits NES
Nephelium lappaceum	Rambutan	hermaphrodite (functional gynoecious), androecious	apomixis in some varieties	honey bees (***Apis cerana***), stingless bees, flies	**little** in Roubik 1995; in Heard 1999; in Slaa *et al.* 2006	commodity, fresh tropical fruits NES

Opuntia ficus-indica	Prickly pear	hermaphrodite, mostly self-incompatible	parthenocarpy	bumble bees	**modest (indirect**) Grant & Hurt 1979; Weiss *et al.* 1993; in DeFelice 2004	commodity, fresh fruits NES
Passiflora edulis	Passion fruit, Maracuja	hermaphrodite, most varieties largely self-incompatible	passive self-pollination in some varieties (Bruckner *et al.* 1995), hand pollination	carpenter bees (=solitary bees) (***Xylocopa frontalis, X. suspecta***) bumble bees, hummingbirds	**essential** Corbert & Willmer 1980; in Free 1993; Brancher 1999; Camillo 1996; Da Silva 1999; in Delaplane & Mayer 2000; in Westerkamp & Gottsberger 2000; Almeida Lima 2002; Freitas & De Oliveira Filho 2003	commodity, fresh tropical fruits NES
Persea americana	Avocado	hermaphrodite, dichogamous, self-incompatible	passive self-pollination	honey bees, stingless bees, solitary bees	**great** Vithanage 1990; in Free 1993; Ish-Am & Eisikowitch 1993, du Toit 1994; Ish-Am 1998a,b; Ish-Am 1999 in Heard 1999; in Delaplane & Mayer 2000; Gazit & Degani 2002; Can-Alonso *et al.* 2005	no
Pouteria sapota (syns. *Calocarpum sapota, Calocarpum mammosum, Pouteria mammosa*)	Sapote, Mamey colorado	hermaphrodite, night anthesis	unknown	honey bees	**unknown** Morton 1987; Davenport & O'Neal 2000	commodity, fresh tropical fruits NES
Prunus domestica, P. spinosa	Plum, Greengage, Mirabelle, Sloe	hermaphrodite varieties self-incompatible or self-compatible	passive self-pollination	honey bees (***Apis mellifera***), bumble bees, solitary bees (***Osmia lignaria propinqua***), flies	**great** in Free 1993; Calzoni & Speranza 1998; in Delaplane & Mayer 2000; in Westerkamp & Gottsberger 2000; Frève *et al.* 2001; in Szábo 2003	yes
Prunus persica, *Persica laevis*	Peach, Nectarine	hermaphrodite, self-compatible	passive self-pollination	honey bees (***Apis mellifera***), bumble bees, solitary bees (***Osmia cornifrons***, ***O. lignaria propinqua)***, flies	**great** in Free 1993; in Delaplane & Mayer 2000; in Westerkamp & Gottsberger 2000; da Mota & Nogueira-Couto 2002; in Szábo *et al*. 2003b	yes
Prunus avium	Sweet cherry	hermaphrodite, mostly self-incompatible	passive self-pollination	honey bees (***Apis mellifera***), bumble bees, solitary bees (***Osmia lignaria***)**,** flies	**great** Bosch & Kemp 1999; in Delaplane & Mayer 2000; in Nyéki *et al.* 2003a; Bosch *et al.* 2006	no
Prunus armeniaca	Apricot	hermaphrodite (old-world varieties self-compatible, new-world varieties self-incompatible)	passive self-pollination	honey bees (***Apis mellifera***), bumble bees, solitary bees (***Osmia cornifrons***, ***O. lignaria propinqua***), flies	**great** in Free 1993; McLaren *et al.* 1995; Austin *et al.* 1996; in Delaplane & Mayer 2000; in Westerkamp & Gottsberger 2000; in Szábo *et al*. 2003a; Benedek *et al.* 2006; Vaissière *et al*. 2006	no
Prunus cerasus	Sour cherry	hermaphrodite, varying level of self-compatibility	passive self-pollination	honey bees (***Apis mellifera***), bumble bees, solitary bees**,** flies	**great** in Free 1993; in Delaplane & Mayer 2000; in Nyéki *et al.* 2003b	no

Psidium guajava	Guava, Guayaba	hermaphrodite, self-compatible	passive self-pollination	honey bees (***Apis mellifera***), stingless bees (***Trigona cupira***), bumble bees (***Bombus mexicanus***), solitary bees (***Lasioglossum*** spp.)	**modest** Hedström 1988; in Sharma & Jindal 1997; Lakshmi & Mohana Rao 1998; in Heard 1999	commodity, fresh tropical fruits NES
Punica granatum	Pome-granate	hermaphrodite, andro-monoecious, partly self-incompatible	passive self-pollination	honey bees, beetles (*Cetonia, Trichodes)*	**modest** in Free 1993; in Knuth 1908; Rana & Dwivedi 1997; Melgarejo *et al.* 2000; Derin & Eti 2001; Mars & Marrakchi 2004	commodity, fresh fruits NES
Pyrus communis	Pear	hermaphrodite, lself-incompatible	passive self-pollination	honey bees (***Apis mellifera***), bumble bees, solitary bees (***Osmia* sp**.), flies (***Eristalis* sp.**)	**great** in Free 1993; in Delaplane & Mayer 2000; in Westerkamp & Gottsberger 2000; Maccagnani *et al.* 2003; in Nyéki & Soltész 2003; Monzón *et al.* 2004; Stern *et al.* 2004	yes
Ribes nigrum, R. rubrum	Black currant, Red currant	hermaphrodite, varying degree of self-incompatibility depending on species and variety	passive self-pollination	honey bees (***Apis mellifera***), bumble bees (***Bombus* sp**.), solitary bees	**modest** in Free 1993; Koltowski *et al.* 1997; Koltowski *et al.* 1999; in Soltész *et al.* 2003b	no
Rosa spp. (*R. canin*a and all other spp. in section *Caninae)*	Rose hips, Dogroses	hermaphrodite, varying degree of self-compatibility depending on species and hybrids	self-pollination, parthenocarpy	honey bees, bumble bees (***Bombus*** spp.), carpenter bees (*Xylocopa* spp.), solitary bees, hover flies (***Eristalis*** spp.)	**great** Jicinska 1976; Stougaard 1983; Yeboah Gyan & Woodell 1987; Kevan *et al.* 1990; Ueda & Akimoto 2001; in Kevan 2003	commodity, fresh fruits NES
Rubus idaeus, R. fruiticosus, *R. chamaemorus, R. flagellaris, R. trivalis*	Raspberry, Blackberry, Clouderry, Northern Dewberry, Southern Dewberry	hermaphrodite, self-compatible	passive self-pollination yielding inferior fruits	honey bees (***Apis mellifera***), bumble bees (***Bombus*** spp.), solitary bees (***Osmia aglaia, O. cornuta***), hover flies (***Eristalis*** spp.)	**great** Yeboah Gyan & Woodell 1987; Chagnon *et al.* 1991; in Free 1993; Willmer *et al.* 1994; Pinzauti *et al.* 1997; Pelletier *et al.* 2001; Cane 2005	no

Sambucus nigra	Elderberry	hermaphrodite, self-compatible	passive self-pollination	honey bees, flies, longhorn beeltes	**modest** Bolli 1994	commodity, fresh fruits NES
Solanum quitoense	Naranjillo	hermaphrodite, self-compatible, buzz-pollination		bumble bees	**great** Heiser *et al.* 1972; Roubik 1995; Almanza *et al.* 2006	commodity, fresh tropical fruits NES
Sorbus aucuparia	Rowanberry	hermaphrodite, self-incompatible	passive self-pollination	honey bees, bumble bees, syrphid flies	**essential** Campbell *et al*. 1991; Bixby & Levin 1996; Sperens 1996; Raspé 1998; Pías & Guitián 2006	commodity, fresh fruits NES
Sorbus domestica	Service-apple	hermaphrodite, self-incompatible		bees, flies	**modest (indirect**) Campbell *et al*. 1991; Kausch-Blecken von Schmeling 1992	commodity, fresh fruits NES
Spondias ssp., mainly *S. mombin, S. tuberosa*	Hog plum, Mombin	hermaphrodite, varying degree of self-incompatibility depending on species and variety	wind pollination	honey bees (*Apis mellifera*), stingless bess (*Melipona* sp.)	**little** Dominguez Sanchez *et al.* 2002	commodity, fresh tropical fruits NES
Tamarindus indica	Tamarind	hermaphrodite	passive self-pollination	honey bees ***(Apis dorsata)***	**little** in Free 1993	commodity, fresh fruits NES
Vaccinium corymbosum, V. angustifolium, V. ashei, V. myrtillus	Highbush blueberry, Lowbush blueberry, Rabbiteye blueberry, Bilberry	hermaphrodite, self-compatible, with varying degree of self-incompatibility, buzz-pollination	passive self-pollination	honey bees (***Apis mellifera***), bumble bees (***Bombus impatiens***), solitary bees (***Anthophora pilipes, Colletes*** sp., ***Habropoda laboriosa, Osmia ribifloris, O. lignaria***)	**great** Payne *et al.* 1989; Cane & Payne 1990; in Free 1993; Dogterom 1999; Stubbs & Drummon 1999, 2001; Dogterom *et al.* 2000; Sampson & Cane 2000; in Delaplane & Mayer 2000; Hokanson & Hancock 2000; Aras *et al.* 1996; Cane 1997; Javorek *et al.* 2002; Dedej & Delaplane 2003; Sampson *et al.* 2004; Desjardins & De Oliveira 2006	no
Vaccinium macrocarpon, V. oxycoccus	American cranberry, European cranberry	hermaphrodite, self-compatible, buzz-pollination	passive self-pollination	honey bees (***Apis mellifera***), bumble bees (***Bombus affinis***), solitary bees **(*Megachile (Delomegachile) addenda, M. rotundata*)**	**great** in Free 1993; Cane *et al.* 1996; in Delaplane & Mayer 2000; Cane & Schiffhauer 2003; Brown & McNeil 2006; Evans & Spivak 2006	no
Vitis vinifera	Table grape, Vine grape	hermaphrodite, self-compatible	passive self-pollination, wind pollination	honey bees, solitary bees	**no increase** in Free 1993; Rhodes 2002; but production increase in *V. rotundifolia* Sampson *et al.* 2001	yes
Zizyphus jujuba	Jujube	hermaphrodite, self-compatible	passive self-pollination	honey bees (***Apis mellifera***), flies, beetles, wasps	**modest** in Free 1993; Sharma & Jindal 1997	no
Nut crops						
Amygdalus communis	Almond	hermaphrodite, self-incompatible, but some new varieties self-	passive self-pollination	honey bees (***Apis mellifera***), bumble bees, solitary bees (***Osmia cornuta***),	**great** in Free 1993; Bosch 1994; Bosch & Blas 1994; Torre Grossa *et al.* 1994; in Delaplane & Mayer 2000; in	no

		compatible		flies	Westerkamp & Gottsberger 2000; De Grandi-Hoffman 2001; Thomson & Goodell 2001; Soltész *et al*. 2003a; Lumkin 2005	
Anacardium occidentale	Cashew nut, and Cashewapple	andro-monoecious	passive self-pollination	honey bees (*Apis dorsata, **Apis mellifera***), stingless bees, bumble bees, solitary bees (***Centris tarsata***), butterflies, flies, hummingbirds	**great** Heard *et al.* 1990; in Crane 1991; in Free 1993; Freitas & Paxton 1998; De Holanda-Neto *et al.* 2002; Freitas *et al.* 2002; Bhattacharya 2004	no
Arachis hypogea	Peanut, Groundnut	hermaphrodite, self-compatible	self-pollination (many varieties cleistogamous)	honey bees (*Apis dorsata, Apis florae, **Apis mellifera***), bumble bees, solitary bees, hover flies, butterflies	**little** in Crane 1991; in Free 1993, vary among varieties and no benefit found by Blanche *et al.* 2006 because of infrequent flower visitation	yes
Bertholletia excelsa	Brazil nut, Para nut, Cream nut	hermaphrodite, self-incompatible		bumble bees, solitary bees (Euglossini, *Xylocopa* sp.)	**essential** O'Malley *et al.* 1988; Mori & Prance 1990; in Free 1993; Mauès 2002	no
Castanea sativa	Chestnut	monoecious, largely self-incompatible	wind pollination	honey bees, solitary bees	**modest** Manino *et al.* 1991; De Oliveira *et al.* 2001	no
Macadamia ternifolia	Macadamia	hermaphrodite, largely self-incompatible		honey bees (***Apis mellifera***), stingless bees (***Trigona carbonaria***), solitary bees (*Homalictus* sp.), wasps, butterflies	**essential** in Free 1993; Heard 1993; Heard 1994; Wallace *et al.* 1996; Blanche *et al.* 2006b	commodity, nuts NES
Edible oil and proteinaceous crops						
Brassica alba, B. hirta, Sinapis alba, B. nigra, Sinapis nigra	Mustard seeds	hermaphrodite, self-compatible	passive self-pollination, wind pollination	honey bees (***Apis mellifera***), solitary bees (***Osmia cornifrons, O. lignaria lignaria***)	**modest** in Free 1993; Abel & Wilson 1999; Abel *et al.* 2003	no
Brassica napus oleifera	Rapeseed, Oilseed rape	hermaphrodite, self-compatible	passive self-pollination, wind pollination	honey bees (***Apis mellifera***), bumble bees, solitary bees (*Andrena* sp., ***Osmia cornifrons, Osmia lignaria lignari,*** *Halictus sp., Bombus* sp.), hoverflies	**modest** in Free 1993; Adegas & Noqueira Couto 1992; Abel & Wilson 1999; Bürger 2004; Manning & Boland 2000; Abel *et al.* 2003; Morandin & Winston 2005	yes
Brassica rapa (formerly *B. campestris)*	Turnip rape, Canola	hermaphrodite, largely self-incompatible	passive self-pollination, wind pollination	honey bees *(**Apis cerana, A. florea, A. mellifera)***, solitary bees *(**Andrena ilerda**, **O. cornifrons, O.***	**great** differ greatly among varieties; in Crane 1991; in Free 1993; Schittenhelm *et al.* 1997; Abel & Wilson 1999; in Delaplane & Mayer 2000; Westcott &	no

				lignaria lignari, Halictus spp.), flies (***Eristalis*** spp., ***Trichometallea pollinosa***)	Nelson 2001; Abel *et al.* 2003	
Carthamus tinctorius	safflower	hermaphrodite, self-compatible	variable passive self-pollination	honey bees (***Apis cerana***, ***A. mellifera***), solitary bees	**little** differ greatly among varieties; in Crane 1991; in Free 1993; Dajue & Mündel 1996	no
Cocos nucifera	Coconut	monoecious, partially self-compatible	passive self-pollination, little wind pollination	honey bees, stingless bees	**modest** in Free 1993; Da Conceicao *et al.* 2004; Meléndez-Ramírez *et al.* 2004	yes
Elaeis guineensis	Oil palm	monoecious	wind pollination	weevils (***Elaeidobius* sp.**), thrips (***Thrips hawaiiensis***)	**little** in Free 1993; Dhileepan 1994; in Westerkamp & Gottsberger 2000; Tandon *et al.* 2001; Krantz & Poinar 2004; Mayfield 2005 (but no effects of forest distance on pollination)	yes
Glycine max, G. soja	Soybean	hermaphrodite, self-compatible	passive self-pollination (most varieties cleistogamous)	honey bees (***Apis mellifera***), bumble bees, solitary bees, (***Megachile rotundata***)	**modest** Koelling *et al.* 1981; in Free 1993; Moreti *et al.* 1998; Nogueira-Couto *et al.* 1998 for G. wightii; Chiari *et al.* 2005a,b (vary greatly among varieties, no benefit found by Ray *et al.* 2003 and some studies in Free 1993)	yes
Gossypium hirsutum, G. barbadense, G. arboreum, G. herbaceum	Seedcotton	hermaphrodite, self-compatible	passive self-pollination	honey bees (***Apis* sp.**), bumble bees (***Bombus* sp.**), solitary bees (mainly *Xylocopa* sp.), wasps	**modest** in Free 1993; Rhodes 2002	yes
Helianthus annuus	Sunflower seeds	dichogamous, variable level of self-compatibility among varieties	passive self-pollination, but very low	honey bees (***Apis cerana, A. mellifera***), bumble bees, solitary bees, stingless bees (***Trigona iridipennis***)	**modest** Bichee & Sharma 1988; in Crane 1991; in Free 1993; DeGrandi-Hoffman & Martin 1993; Moreti *et al.* 1996; in Heard 1999; DeGrandi-Hoffman & Watkins 2000; Dag *et al.* 2002; Greenleaf 2005, Greenleaf & Kremen 2006b	yes
Linum usitatissimum	Flaxseed	hermaphrodite, self-compatible	passive self-pollination, wind pollination	honey bees (***Apis* sp.**), bumble bees	**little** in Free 1993 (only in some varieties)	no

Olea europaea	Olive	andro-monoecious, variable level of self-incompatibility among varieties	passive self-pollination, wind pollination	honey bees visit flowers occasionally	**no increase** in Free 1993; Singh 1997 (differ greatly among varieties) some authors classify olives to have little benefit according to Griggs *et al.* 1975	yes
Sesamum indicum	Sesame	hermaphrodite, self-compatible	passive self-pollination	honey bees (***Apis cerana, A. mellifera***), solitary bees, wasps, flies	**modest** in Free 1993; in Crane 1991	no
Vicia faba	Broad bean, Faba bean, Field bean, Horse bean	hermaphrodite, self-compatible	variable level of passive self-pollination among varieties	honey bees (***Apis mellifera***), bumble bees (***Bombus lapidarius, B. pascuorum, B. hortorum)***, solitary bees (*Anthophora plumipes*, ***Eucera*** spp., ***Megachile rotundata*****)**	**modest** in Free 1993; Le Guen *et al*. 1993; Suso *et al*. 1996; Bond & Kirby 1999; Pierre *et al*. 1999; Somerville 1999	yes
Vitellaria paradoxa (syn. *Butyrospermum paradoxum*)	Karite nuts, Sheanuts	hermaphrodite		honey bees (*Apis mellifera adansonii*)	**modest** Millogo-Rasolodimby 1989; Kelly *et al.* 2004; Sanou *et al.* 2005; Tchuenguem Fohouo *et al.* 2005	no
Stimulant crops						
Coffea arabica, C. canephora	Coffee	hermaphrodite, variable level of self-compatibility	passive self-pollination (mainly *C. arabica*), wind-pollination (mainly *C. canephora*)	honey bees **(*Apis dorsata A. mellifera,*)**, stingless bees (***Trigona*** (***Lepidotrigona) terminata***), solitary bees (***Creightonella frontalis, Xylocopa (Zonohirsuta dejeanii*****)**	**modest** in Free 1993; Malerbo-Souza & Nogueira-Couto 1997; Manrique & Thimann 2002; Roubik 2002a,b; Klein *et al.* 2003a,b,c; De Marco & Coelho 2004; Ricketts *et al.* 2004; Ricketts 2004 *C. canephora* classified in **great**	yes
Cola nitida, C. vera, C. acuminata	Cola nut, Kola nut	hermaphrodite, andro-monoecious, self-incompatible		flies	**great (indirect)** in McGregor 1976; Jacob 1980; Osei 1995-1996	no
Theobroma cacao	Cocoa	hermaphrodite, variable level of self-incompatibility (self-compatible in the amelonado varieties)		bees, **cecidomyiid midges ceratopogonid midges**	**essential** in Free 1993; Falque *et al*. 1995, 1996; Lachenaud 1994; in Westerkamp & Gottsberger 2000	no
Spices and condiments						
Afromomum melegueta	Grains of paradise	unknown	unknown	unknown	**unknown**	no
Carum carvi	Caraway	andro-monoecious, dichogamous,	wind pollination, little passive self-pollination	solitary bees, flies (Ricciardelli D'Albore 1986)	**modest** Bouwmeester *et al.* 1995; Bouwmeester & Smid 1995;	no

		self-compatible			Németh *et al.* 1999, Németh & Székely 2000; Langenberger & Davis 2002	
Coriandrum sativum	Coriander	hermaphrodite, self-compatible	passive self-pollination	honey bees (*Apis cerana, A. dorsata, A. florea, A. mellifera*), stingless bees, solitary bees	**great** in Crane 1991; in Free 1993; Koul *et al.* 1993; Diederichsen 1996	no
Cuminum cyminum	Cumin	hermaphrodite, self-compatible	wind pollination, little passive self-pollination	unknown	**great** in Free 1993	no
Elettaria cardamomum	Cardamom	hermaphrodite	passive self-pollination	honey bees (*Apis cerana, Apis dorsata, Apis florea*), solitary bees	**great** in Crane 1991; in Free 1993; Sasikumar *et al.* 1999	no
Illicium verum	Star anise	hermaphrodite, self-incompatible	unknown	unknown	**unknown** highly self-incompatible for *I. floridanum* (Thien *et al.* 1983)	no
Foeniculum vulgare	Fennel seed	hermaphrodite, few andro-monoecious, dichogamous, self-incompatible	wind pollination, little passive self-pollination	honey bees (***Apis florea***, *A. mellifera*)	**great** in McGregor 1976; in Free 1993; Koul *et al.* 1993; Németh *et al*. 1999; Falzari *et al*. 2005	no
Myristica fragrans	Nutmeg	dioecious	wind pollination	beetles (*Formicomus braminus*)	**great (indirect**) Armstrong & Drummond 1986	no
Pimenta dioica (syn. *P. officinalis, P. dioica)*	Allspice, Pimento	dioecious	unknown	honey bees, *Halictus, Exomalopsis, Ceratina*	**great (indirect**) in Free 1993; Lughadha & Proenca 1996	no
Piper nigrum, P. longum	Pepper	hermaphrodite, self-compatible, dichogamous	passive self-pollination, wind pollination	bees, hover flies as flower visitors	**no increase** in Free 1993, but insect pollination mentioned in Roubik 1995; Sargent & Otto 2004	no
Pimpinella anisum	Anise	hermaphrodite	passive self-pollination, wind pollination	honey bees (*Apis mellifera)*, solitary bees, flies	**unknown** in McGregor 1976; Ricciardelli D'Albore 1986	no
Vanilla planifolia, V. pompona	Vanilla	hermaphrodite, self-incompatible	hand pollination	stingless bees, solitary bees, hummingbirds	**essential** little natural pollination (< 1%) in Free 1993	no

***[1]** we pooled all the different species and varieties of citrus although they differ greatly in their dependence on insect pollination. Insect pollination increases the number of seeds per fruit and as seeds are not eligible for consumers, bee hives are frequently removed from plantations in some countries in Europe and the US (see for example http://www.beesource.com/pov/traynor/bcapr2003.htm). On the other hand it might be that some parthenocarpic citrus varities set only seedless fruits when viable and compatible pollen are transferred. This could be shown for example in triploid watermelon (Maroto *et al*. 1993).

The results in comparison to other crop pollination reviews: for nine crops, for which evidence was lacking in earlier reviews (for global crops in McGregor 1976; Crane & Walker 1984; Free 1993; for specific regions see list above), we found recent pollination studies that show increased production with animal pollination.These crops are: caraway, chestnut, common bean, durian, guava, karite nut, longan, naranjilo, and persimmon. For three crops, direct evidence of any kind was missing from earlier studies (brazil nut, cowpea,

and sweet pepper in greenhouses), and 16 of the crops we reviewed had not been reviewed before (azarole, elderberry, grains of paradise, hog plum, mammee, medlar, prickly pear, quinoa, rose hips, rowanberry, sapodilla, sapote, service-apple, star apple, star anise, and tree-strawberry).

Literature cited in Fig. 2, 3

Abbo, S., Shtienberg, D., Lichtenzveig, J., Lev-Yadun, S. & Gopher, A. 2003 The chickpea, summer cropping, and a new model for pulse domestication in the ancient Near East. *Quart*. *Rev*. *Biol*. **78**, 435-448.

Abel, C. A., Wilson, R. L. & Luhmann, R. L. 2003 Pollinating efficacy of *Osmia cornifrons* and *Osmia lignaria* subsp. *lignaria* (Hymenoptera: Megachilidae) on three Brassicaceae species grown under field cages. *J. Kans. Entomol. Soc.* **38**, 545-552.

Abel, C. A. & Wilson, R. L. 1999 The use of diverse plant species for increasing *Osmia cornifrons* (Hymenoptera: Megachilidae) in field cages. *J. Kansas Entomol. Soc.* **71**, 23-28.

Abraham, K. & Gopinathan Nair, P. 1990 Floral biology and artificial pollination in *Dioscorea alata* L. *Euphytica* **48**, 45-51.

Adegas, J. E. B. & Nogueira Couto, R. H. 1992 Entomophilous pollination in rape (*Brassica napus* L. var. *oleifera*) in Brazil. *Apidologie* **23**, 203-209.

Akoroda, M. O. 1983 Floral biology in relation to hand pollination of white yam. *Euphytica* **32**, 831-838.

Allan, R. E. 1980 Wheat. In *Hybridization of crop plants* (ed. W. R. Fehr & H. H. Hadley) pp. 709-720. American Society of Agronomy & Crop Science Society of America, Madison, WI, USA.

Almanza, M. T., Cure, J. R., Rojas, D. & Wittmann, D. 2006 A model to pollinate an exotic fruit (*Solanum quitoense*) with bumlebees. *53 Jahrestagung der Arbeitsgemeinschaft der Bieneninstitute Hohenheim*, Germany.

Almeida Lima, A. de 2002 Maracujá Produção. Embrapa Informação Tecnológica, p. 104 Brasília, Brazil.

Aras, P., De Oliveira, D. & Savoie, L. 1996 Effect of a honey bee (Hymenoptera : Apidae) gradient on the pollination and yield of lowbush blueberry. *J. Econ. Entomol.* **89**, 1080-1083.

Armstrong, J. E. & Drummond, B. A. III 1986 Floral biology of *Myristica fragrans* Houtt. (Myristicaceae), the nutmeg of commerce. *Biotropica* **18**, 32-38.

Asada, S. & Ono, M. 1996 Crop pollination by Japanese bumblebees, *Bombus* spp. (Hymenoptera: Apidae): tomato foraging behaviour and pollination efficiency. *Appl. Entomol. Zool.* **31**, 581-586.

Asworth, L. & Galetto, L. 2001 Pollinators and reproductive success of the wild cucurbit *Cucurbita maxima* ssp. *andreana* (Cucurbitaceae). *Plant Biology* **3**, 398-404.

Austin, P. T., Hewett, E. W., Noiton, D. A. & Plummer, J. A. 1996 Cross pollination of ‚Sundrop' apricot (*Prunus armeniaca* L.) by honeybees. *New Zeal. J. Crop Hort.* **24**, 287-294.

Awasthi, R. P. & Kumar, S. 1997 Kiwifruit. In *Fruit crop pollination* (ed. L. R. Verma & K. K. Jindal) pp. 227-240. Kalyani Pub., Ludhiana, India.

Banga, O. 1961 Breeding *Scorzonera hispanica* L. by the polycross method. *Euphytica* **10**, 49-58.

Batra, S. W. T. 1998 Hornfaced bees for apple pollination. *Am. Bee J.* **138**, 361.

Bauwmeester, H. J. & Smid, H. G. 1995 Seed yield in caraway (*Carum carvi*). 1. Role of pollination. *J Agric. Sci.* **124**, 235-244.

Bouwmeester, H. J., Smid, H. G. & Loman, E. 1995 Seed yield in caraway (*Carum carvi*). 2. role of assimilate availability. *J. Agric. Sci.* **124**, 245-251.

Bell, M. C., Spooner-Hart, R. N. & Haigh, A. M. 2006 Pollination of greenhause tomatoes by the Australian bluebanded bee *Amegilla (Zonamegilla) holmesi* (Hymenoptera: Apidae). *J. Econ. Entomol.* **99**, 437-442.

Benedek, P., Erdös, Z., Skóla, I., Nyéki, J. & Szalay, L. 2006 The effect of reduced bee pollination period to the fruit set of apricots. *Acta Hort.* **701**, 723-726.

Bhatia, R., Gupta, D., Chandel, J. S. & Sharma, N. K. 1995 Relative abundance of insect visitors on flowers of major subtropical fruits in Himachal Pradesh and their effect on fruit set. *Indian J. Agr. S.* **65**, 907-912.

Bhattacharya, A. 2004 Flower visitors and fruit set of *Anacardium occidentale*. *Ann. Bot. Fenn.* **41**, 385-392.

Bichee, S. L. & Sharma, M. 1988 Effect of different modes of pollination in sunflower *Helianthus annuus* L. (Compositae) sown on different dates by *Trigona iridipennis* Smith. *Apiacta* **23**, 65-68.

Bixby, P. J. & Levin, D. A. 1996 Response to selection on autogamy in Phlox. *Evolution* **50**, 892- 899.

Björkman, T. 1995a The effectiveness of heterostyly in preventing illegitimate pollination in dish-shaped flowers. *Sex. Pl. Repro.* **8**, 143-146.

Björkman T. 1995b Role of honey bees (Hymenoptera: Apidae) in the pollination of buckwheat in eastern North America. *J. Econ. Entomol.* **88**,1739-1745.

Blanche, R. & Cunningham, S. A. 2005 Rain forest provides pollinating beetles for atemoya crops. *J. Econ. Entomol.* **98**, 1193-1201.

Blanche, K. R., Hughes, M., Ludwig, J. A. & Cunningham, S. A. 2006a Do flower-tripping bees enhance yields in peanut varieties grown in north Queensland? *Aust. J. Exp. Agr.* in press.

Blanche, K. R., Ludwig, J. A & Cunningham, S. A. 2006b Proximity to rainforest enhances pollination and fruit set in macadamia and longan orchards in north Queensland, Australia. *J. Appl. Ecol*. in press.

Bolli, R. 1994 Revision of the genus *Sambucus*. *Dissertationes Botanica* **223**, 1-227.

Bond, D. A. & Kirby, E. J. M. 1999 *Anthophora plumipes* (Hymenoptera: Anthophoridae) as a pollinator of broad bean (*Vicia faba major*) *J. Api. Res.* **38**, 199-203.

Bosch, J. 1994 The nesting behavior of the mason bee *Osmia cornuta* (Latr.) with special reference to its pollinating potential (Hymenoptera, Megachilidae). *Apidologie* **25**, 84-93.

Bosch, J. & Blas, M. 1994 Foraging behavior and pollinating efficiency of *Osmia cornuta* and *Apis mellifera* on almond (Hymenoptera, Megachilidae and Apidae. *Appl. Entomol. Zool.* **29**, 1-9.

Bosch, J. & Kemp, W. P. 1999 Exceptional cherry production in orchard pollinated with blue orchard bees. *Bee World* **80**, 163-173.

Bosch, J., Kemp, W. P. & Trostle, G. E. 2006 Bee population returns and cherry yields in an orchard pollinated with *Osmia lignaria* (Hymenoptera: Megachilidae). *J*. *Econ*. *Entomol*. **99**, 408-413.

Bouwmeester, H. J. & H. G. Smid. 1995 Seed yield in caraway (*Carum carvi*). 1. role of pollination. *J. Agric. Sci.* **124**, 235-244.

Brancher, A. 1999 Estudo do fornecimento de fontes protéicas em substituição ao pólen para abelhas (*Apis mellifera*). *Reunião Técnica de Pesquisa em Maracujazeiro* **97**.

Brantjes, N. B. M. 1981 Nectar and the pollination of bread fruit, *Artocarpus altilis* (Moraceaae) *Acta Bot. Neerl.* **30**, 345-352.

Brown, O. A. & McNeil, J. N. 2006 Fruit production in cranberry (Ericaceae: Vaccinium macrocarpon): a bet-hedging strategy to optimize reproductive effort. *Am. J. Bot.* **93,** 910-916..

Brown, C. M. 1980 Oat. In *Hybridization of crop plants* (ed. W. R. Fehr & H. H. Hadley) pp. 427-441. American Society of Agronomy & Crop Science Society of America, Madison, WI, USA.

Bruckner, C. H., Casali, V. W. D., de Moraes, C. F., Ragazzi, A. J., & da Silva, E. A. M. 1995 Self-incompatibility in passion fruit (*Passiflora edulis* Sims). *Acta Hort.* **370**, 45-57.

Bürger, C. 2004 Effects of landscape structure on bee diversity and pollination at different spatial scales. PhD thesis. Institute of Agroecology, University of Göttingen, Germany.

Burton, G. W. 1980. Pearl millet. In *Hybridization of crop plants* (ed. W. R. Fehr & H. H. Hadley) pp. 457-469. American Society of Agronomy & Crop Science Society of America, Madison, WI, USA.

Calzoni, G. L. & Speranza, A. 1998 Insect controlled pollination in Japanese plum (*Prunus salicina* Lindl.). *Sci. Hortic.* **72**, 227-237.

Camillo, E. 1996 Polinizacção do maracujá amarelo. *Congresso Braileio de Apicoltura* **11**, 317-321.

Campbell, C.G. 1997 Buckwheat *Fagopyrum esculentum* Moench. Institute of Plant Genetics and crop Plant Research, Gatersleben / International Plant genetic Resoruces Institute, Rome, Italy. 95 pp.

Campbell, C. S., Greene, W. C. & Dickinson, T. A. 1991 Reproductive biology in Subfam. Maloideae (Rosaceae). *Syst. Bot*. **16**, 333-349.

Can-Alonso, C., Fquezada-Euán, J. J. G., Xiu-Ancona, P., Moo-Valle, H., Valdovinos-Nunez, G. R., Medina-Peralta, S. 2005 Pollination of 'criollo' avocados (*Persea americana*) and the behaviour of associated bees in subtropical Mexico. *J. Apic. Res.* **44**, 3-8.

Cane, J. H. 1997 Lifetime monetary value of individual pollinators: the bee *Habropoda laboriosa* at rabbiteye blueberry (*Vaccinium ashei* Reade). *Acta Hort.* **446**, 67-70.

Cane, J. H. 2005 Pollination potential of the bee *Osmia aglaia* for cultivated red raspberries and blackberries (Rubus: Rosaceae). *HortSci.* **40**, 1705-1708.

Cane, J. H. & Payne, J. A. 1990 Native bee pollinates rabbiteye blueberry. *Highlights of Agricultural Research* **37**, 4.

Cane, J. H. & Schiffhauer, D. 2001 Pollinator genetics and pollination: do honey bee colonies selected for pollen-hoarding field better pollinators of cranberry *Vaccinium macrocarpon*? *Ecol. Entomol.* **26**, 117-123.

Cane, J. H. & Schiffhauer, D. 2003 Dose response relationships between pollination and fruiting refine pollinator comparisons for cranberry (*Vaccinium macrocarpon* [Ericaceae]). *Am. J. Bot.* **90**, 1425-1432.

Cane, J. H., Schiffhauer, D. & Kervin, L. J. 1996 Pollination, foraging, and nesting ecology of the leaf-cutting bee *Megachile (Delomegachile) addenda* (Hymenoptera: Megachilidae) on cranberry beds. *Ann. Entomol. Soc. Am.* **89**, 361-367.

Canto-Aguilar, A. & Parra-Tabla, V. 2000 Importance of conserving alternative pollinators: assessing the pollination efficiency of the squash bee, *Peponapis limitaris* in *Cucurbita moschata* (Cucurbitaceae). *J. Ins. Conserv*. **4**, 203-210.

Cardoso, A. I. I. 2003 Seed yield and quality in response to pollen load of squash cv. Piramoita. *Bragantia* **62**, 47-52.

Carreck, N. L. & Williams, H. 1998 The economic value of bees in the UK. *Bee World* **79**, 115-123.

Cavers, P. B. & Harper, J. L. 1964 *Rumex obtusifolius* L. and *R. crispus* L. *J. Ecol*. **52**, 737-766.

Cauich, O., Quezada-Euan, J. J. G., Marcias-Marcias, J. O., Reyes-Oregel, V., Medina-Peralta, S. & Parra-Tabla, V. 2004 Behavior and pollination efficiency of *Nannotrigona perilampoides* (Hymenoptera: Meliponini) on greenhouse tomatoes (*Lycopersicon esculentum*) in stubropical Mexico. *J. Econ. Entomol.* **97**, 475-481.

Chagnon, M., Gingras, J. & De Oliveira, D. 1991 Honey bee (Hymenoptera: Apidae) foraging behaviour and raspberry pollination. *J. Econ. Entomol.* **84**, 457-460.

Chagnon, M., Gingras, J. & De Oliveira, D. 1993 Complementary aspects of strawberry pollination by honey and indigenous bees (Hymenoptera). *J. Econ. Entomol.* **86**, 416-420.

Chacoff, N. P. 2007 Los ecosistemas naturales como fuente de polinizadores para cultivos en el pedemonte de las yungas. PhD Thesis. Universidad Nacional del Comahue. Argentina in press.

Chacoff, N. P. & Aizen, M. A. 2006 Edge effects on flower-visiting insects in grapefruit plantations bordering premontane subtropical forest. *J. Appl. Ecol.* **43**, 18-27.

Chiari, W. C., de Alencar Arnaut de Toledo, V., Ruvolo-Takasusuki, M. C. C., Attencia, V. M., Costa, F. M., Kotaka, C. S., Sakaguti, E. S. & Magalhaes, H. R. 2005a Floral biology and behavior of Africanized honeybees *Apis* mellifera in soybean (*Glycine max* L. Merril). *Braz. Arch. Biol.Technol.* **48**, 367-378.

Chiari, W. C., de Alencar Arnaut de Toledo, V., Ruvolo-Takasusuki, M. C. C., de Oliveira, A. J. B., Sakaguti, E. S., Attencia, V. M., costa, F. M. & Mitsui, M. H. 2005b Pollination of soybean (*Glycine max* L. Merril) by honey bees (*Apis mellifera* L.). *Braz. Arch. Biol.Technol.* **48**, 31-36.

Corbet, S. A. & Willmer, P. 1980a *Passiflora* and *Xylocopa*: economic and evolutionary considerations. *Acta Bot. Neerl.* **29**, 55.

Costa, G., Testolin, R. & Vizzotto, G. 1993 Kiwifruit pollination: an unbiased estimate of wind and bee contribution. *New Zeal. J. Crop Hort.* **21**, 189-195.

Crane, E. 1991 *Apis* species of tropical Asia as pollinators and some rearing methods for them. *Acta Hort*. **288**, 29-48.

Crossa-Raynaud, P. 1984 Quelques productions fruitières dépendant d'une pollinisation anémogame: noyer, noisetier, olivier, palmier-dattier, pistachier. In *Pollinisation et productions végétales* (ed. Pesson, P. & J. Louveaux). INRA, Paris, France.

Da Conceicao, E. S., Delabie, J. H. C. & De Costa Neto, A. 2004 The entomophily of the coconut tree in question: The evaluation of pollen transportation by ants (Hymenoptera: Formicidae) and bees (Hymenoptera: Apoidea) in inflorescence. *Neotropical Entomol.* **33**, 679- 683.

Dag, A. & Kammer, Y. 2001 Comparison between the effectiveness of honey bee (*Apis mellifera*) and bumble bee (*Bombus terrestris*) as pollinators of greenhouse sweet pepper (*Capsicum annuum*) *Am. Bee J.* **141**, 447-448.

Da Mota, M. O. S. & Nogueira-Couto, R. H. 2002 Entomophilous pollination in peach (*Prunus persica* L.). *Braz. J. Vet. Res. Anim. Sci.* **39**, 124-128.

Da Silva, M. A. E., Bruckner, C. H. , Picanço, M. & Molina-Rugama, A. 1999 Número floral, clima, densidad poblacional de *Xylocopa* spp. (Hymenoptera: Anthophoridae) y polinización del maracuyá (*Passiflora edulis* f. *flavicarpa*). *Rev. Biol. Trop.* **47**, 711-718.

Dag, A., Degani, C. & Gazit, S. 2001 In-hive pollen transfer in mango. *Acta Hort.* **561**, 61-65.

Dag, A., Lior, E. & Afik, O. 2002 Pollination of confection sunflowers (*Helianthus annuus* L.) by honey bees (*Apis mellifera*). *Am*. *Bee J*. **142**, 443- 445.

Dajue, L, Mündel, H.H. 1996 Safflower *Carthamus tinctorius* L. Institute of Plant Genetics and crop Plant Research, Gatersleben / International Plant genetic Resoruces Institute, Rome, Italy. 83 pp.

Davenport, T. L. & O'Neal, J. T. 2000 Flowering and fruit set of mamey sapote [*Calocarpum sapota* (jacq.) Merr.] cv. Magaña in south Florida. *Scientia Hort*. **83**, 61-70.

Dedej, S. & Delaplane, K. S. 2003 Honey bee (Hymenoptera: Apidae) pollination of rabbiteye blueberry *Vaccinium ashei* var. 'Climax' is pollinator density-dependent. *J. Econ. Entom.* **96**, 1215-1220.

Dedej, S. & Delaplane, K. S. 2004 Nectar-robbing carpenter bees reduce seed-setting capability of honey bees (Hymenoptera: Apidae) in rabbiteye blueberry, *Vaccinium ashei*, 'Climax'. *Environ. Entomol.* ***33***, 100-106.

DeFelice, M. S. 2004 Prickly pear cactus, *Opuntia* spp. - a spine-tingling tale. *Weed Technol.* **18**, 869-877.

Degen, B., Caron, H., Bandou, E., Maggia, L., Chevallier, M-H., Leveau, A. & Kremer A. 2001 Fine-scale spatial genetic structure of eight tropical tree species analysed by RAPDs. *Heredity* **87**, 497-507.

Degenhardt, J., Orth, A. I. & Guerra, M. P. et al. 2001 Flower morphology of Feijoa (*Feijoa sellowiana*) and it's implications of pollination. *Rev. Bras. Frutic.* **23**, 718-721.

De Grandi-Hoffman, G. 2001 The pollination of almonds. *Am. Bee J.* **141**, 655-657.

De Grandi-Hoffman, G. & Martin, J. H. 1993 The size and distribution of the honey bee (*Apis mellifera* L.) cross-pollinating population on male sterile sunflowers (*Helianthus annuus* L.). *J. Apic. Res*. **32**, 135-142.

De Grandi-Hoffman, G. & Watkins, J. C. 2000 The foraging activity of honey bees *Apis mellifera* and non-*Apis* bees on hybrid sunflowers (*Helianthus annuus*) and its influence on cross-pollination and seed set. *J. Apic. Res.* **39**, 37-45.

De Holanda-Neto, J. P., Freitas, B. M., Bueno, D. M. & De Aranjo, Z. B. 2002 Low seed/ nut productivity in cashew (*Anacardium occidentale*): Effects of self- incompatibility and honey bee (*Apis mellifera*) foraging behaviour. *J. Hort. Sci. Biotech.* **77**, 226-231.

Delaplane, K. S. & Mayer, D. F. 2000 Crop pollination by bees. CABI Publishing, New. York, USA.

De Lozano, N. B. 1986 Contribution to the study of the floral anatomy and pollination of the hog plum (*Spondias mombin* L.). *Caldasia* **15**, 369-380.

De Marco Jr., P. & Coelho, F. M. 2004 Services performed by the ecosystem: forest remnants influence agricultural culture pollination and production. *Biodivers. Conserv.* **13**, 1245-1255.

De Oliveira Cruz, D., Freitas, B. M., Da Silva, L. A., da Silva, E. M. S., Bomfim, I. G. A. 2005 Pollination efficiency of the stingless bee *Melipona subnitida* on greenhouse sweet pepper. *Presq. Agropec. Bras.* **40**, 1197-1201.

De Oliveira, D., Gomes, A., Ilharco, F. A., Manteigas, A. M., Pinto, J. & Ramalho, J. 2001 Importance of insect pollinators for the production of the chestnut *Castanea sativa*. *Acta Hort*. **561**, 269-273.

Devy, M. S. & Davidar, P. 2003 Pollination systems of trees in Kakachi, a mid-elevation wet evergreen forest of Western Ghats, India. *Am. J. Bot*. **90**, 650-657 (supporting data http://ajbsupp.botany.org/v90/).

Derin, K. & Eti, S. 2001 Determination of pollen quality, quantity and effect of cross pollination on the fruit set and quality in the pomegranate. *Turk. J. Agric. For.* **25**, 169-173.

Desjardins, È.-C & De Oliveira, D. 2006 Commercial bumblee bee *Bombus impatiens* (Hymenoptera: Apidae) as a pollinator in lowbush blueberry (Ericale : Ericaceae) fields. *J. Econ. Entomol.* **99**, 443-449.

Dhileepan, K. 1994 Variation in popuations of the introduced pollinating weevil (*Elaeidobius kamerunicus*) (Coleptera; Curculionidae) and its impact on fruit set of oil palm (*Elaeis guineensis*) in India. *Bull. Entomol. Res.* **84**, 477-485.

Diederichsen, A. 1996 Coriander *Coriandrum sativum* L. 82 pp. Institute of Plant Genetics and crop Plant Research, Gatersleben / International Plant genetic Resoruces Institute, Rome, Italy.

Dogterom, M. H. 1999 Pollination by four species of bees on highbush blueberry. Ph.D. Thesis. Simon Fraser Univ., Burnaby, B.C., Canada.

Dogterom, M. H., Winston, M. L. & Mukai, A. 2000 Effect of pollen load size and source (self, outcross) on seed and fruit production in highbush blueberry cv. 'Bluecrop' (*Vaccinium corymbosum*; Ericaceae). *Am. J. Bot.* **87**, 1584-1591.

Doku, E.V. 1968 Flowering, pollination and pod formation in bambara groundnut (*Voandzeia subterranea*) in Ghana. *Exp. Agr.* **4**, 41-48.

Dominguez Sanchez, D., Goulson, D., Serna Ramos, R. 2002 Stingless bees as alternative pollinators and their possible competition with Africanized bees in Tabasco, Mexico. *Bees without frontiers: The Proceedings of the Sixth European Bee Conference IBRA*, Cardiff, UK, 1-5 July 2002, pp. 128-133.

Dönmez, A. A. 2004 The genus *Crataegus* L. (Rosaceae) with special reference to hybridisation and biodiversity in Turkey. *Turk. J. Bot*. **28**, 29-37.

Ducroquet, J. P. H. J. & Hickel, E. R. 1997 Birds as pollinators of feijoa (*Acca sellowiana* Bera). *Acta Hort.* **452**, 37-40.

Dunthorn, M. 2004 Cryptic dioecy in *Mammea* (Clusiaceae). *Plant Syst. Evol*. **249**, 191-196.

Du Toit, A. P. 1990 Pollination research: a missing link in subtropical fruit production. *Acta Hort*. **275**, 239-243.

Du Toit, A. P. 1994 Pollination of avocados, mangos and litchis. *Inligtingsbulletin Institut vir Tropiese en Subtropiese Gewasse* **262**, 7-8.

Eisikowitch, D., Dafni, A. & Ivri, Y. 1986 Reward-partitioning in *Capparis* spp. along ecological gradient. *Oecologia* **71**, 47-50.

Ercan, N. & Onus, A. N. 2003 The effects of bumblebees (*Bombus terrestris* L.) on fruit quality and yield of pepper (*Capsicum annuum* L.) grown in an unheated greenhouse. *Israel J. Plant Sci.* **51**, 275-283.

Erskine, W. & Muehlbauer, F. J. 1991 Allozyme and morphological variability, outcrossing rate and core collection formation in lentil germplasm. *Theor. Appl. Genet*. **83**, 119-125.

Etoh, T. & Hong, C. J. 2001 RAPD markers for fertile garlic. *Acta Hort*. **555**, 209-212.

Evans, E. C. & Spivak, M. 2006 Effects of honey bee (Hymenoptera: Apidae) and bumble bee (Hymeoptera: Apida) presence on cranberry (Ericales: Ericacaeae) pollination. *J. Econ. Entomol.* **99**, 614-620.

Falque, M., Vincent, A., Vaissière, B. E. & Eskes, A. B. 1995 Effect of pollination intensity on fruit and seed set in *Theobroma cacao* L. *Sex. Plant Reprod*. **8**, 354-360.

Falque, M., Lesdalons, C. & Eskes, A. B. 1996 Comparison of two cacao (*Theobroma cacao* L.) clones for the effect of pollination intensity on fruit set and seed content. *Sex. Plant Reprod*. **9**, 221-227.

Falzari, L. M., Menary, R. C. & Dragar, V. A. 2005 Reducing fennel stand density increases pollen production, improving potential for pollination and subsequent oil yield. *HortScience* **40**, 629-634.

FAOSTAT data 2005 Data available at http://faostat.fao.org; Agricultural data/Agricultural production/Crops primary. last accessed in July 2006.

Fourez, A. 1995 Impact of pollination by bees (*Apis mellifera* Linne) on the production of apples (CV Jonagold). *Bel. J. Zool.* **125**, 135-141.

Franklin, G., Pius, P. K. & Ignacimuthu, S. 2000 Factors affecting *in vitro* flowering and fruiting of green pea (*Pisum sativum* L.) *Euphytica* **115**, 65-74.

Free, J. B. 1993 Insect Pollination of Crops. Academic Press, London, UK.

Freitas, B. M. & De Oliveira Filho, J. H. 2003 Rational nesting box to carpenter bees (*Xylocopa frontalis*) in the pollination of passionfruit (*Passiflora edulis*). *Cienc. Rural* **33**, 1135-1139.

Freitas, B. M. & Paxton, R. J. 1998 A comparison of two pollinators: the introduced honey bee *Apis mellifera* and an indigenous bee *Centris tarsata* on cashew *Anacardium occidentale* in its native range of NE Brazil. *J. Appl. Biol.* **35**, 109-121.

Freitas, B. M., Paxton, R. J., de Holanda-Neto, J. P. 2002 Identifiying pollinators among an array of flower visitors, and the case of inadequate cashew pollination in NE Brazil (ed. P. G. Kevan & Imperatriz-Fonseca, V. L.), pp. 229-254. Ministry of Environment: Secretariat for Biodiversity and Forests, Brazil.

Frève, A., de Oliveira, D. & Gingras, J. 2001 Insect pollination and production in two old varieties of Damas Plums (*Prunus domestica* L.) *Acta Hort.* **561**, 249-251.

Fuchs, R. & Müller, M. 2004 Pollination problems in styrain oil pumpkin plants: can bumblebees be an alternative to honeybees? *Phton (Horn, Austria)* **44**, 155-165.

Galon, I., Gazit, S. & Podoler, H. 1982 Improvement of natural fruit set of Annona by increasing the population of pollinating insects. *Alon Halontea* **9**, 611-614.

Garcia Neto, M., Couto, R. H. N., Malheiros, E. B. 1988 Polinização em *Dolichos lab-lab*. *Ciência Zootécnica* **3**, 3-4.

Gazit, S. & Degani, C. 2002 Reproductive Biology. In *The Avocado: Botany, Production and Uses.* (ed. A. W. Whiley, B. Schaffer & B. N. Wolstenholme) pp. 101-133. CAB International, Wallingford.

Gazit, S., Galon, I. & Podoler, H. 1982 The role of nitidulid beetles in natural pollination of annona in Israel. *J. Am. Soc. Hort. Sci* **107**, 849-852.

George, A. P., Nissen, R. J. & Campbell, J. A. 1992 Pollination and selection in *Annona* species (cherimoya, atemoya and sugar apple). *Acta Hort.* **321**, 178-185.

George, A. P., Nissen, R. J., Ironside, D. A. & Anderson, P. 1989 Effects of nitidulid beetles on pollination and fruit set of *Annona* spp. hybrids. *Sci. Hortic.* **39**, 289-299.

George, S. T., Pillai, K. R., Lim, K. H., Tham, S. & Zainal Abidin, M. 1994 Recent developments in assisted cross-pollination to enhance yield of durian clone D24. In *Recent Developments in Durian Cultivation* (ed. O. Mohamad, M. Zainal Abidin & M. O Shamsudin) pp. 63-70. MARDI. Serdang, Malysia.

Gingras, D., Gingras, J. & De Olivera, D. 1999 Visits of honeybees (Hymenoptera: Apidae) and their effects on cucumber yields in the field. *J. Econ. Entomol.* **92**, 435-438.

Gonzalez, M. V., Coque, M. & Herrero, M. 1998 Influence of pollination systems on fruit set and fruit quality in kiwifruit (*Actinidia deliciosa*). *Ann. Appl. Biol.* **132**, 349- 355.

Goodman, R., Hepworth, G., Kaczynski, P., McKee, B., Clarke, S. & Bluett, C. 2001 Honeybee pollination of buckwheat (*Fagopyrum esculentum* Moench cv. Manor). *Aust. J. Exp. Agr.* **41**, 1217-1221.

Gottsberger, G. 1999 Pollination and evolution in neotropical Annonaceae. *Plant Species Biol.* **14**, 143-152.

Goubara, M. & Takasaki, T. 2004 Pollination effects of the sweat bee *Lasioglossum villosulum trichopse* (Hymenoptera : Halictidae) on genic male-sterile lettuce. *Appl. Entomol. Zool.* **39**, 163-169.

Grant, V. & Hurd, P. D. 1979 Pollination of southwestern Opuntias. *Plant. Syst. Evol.* **133**, 15-28.

Grau, A., Dueñas, R. O., Cabrera, C. N. & Hermann, M. 2003 Mashua *Tropaeolum tuberosum* Ruîz & Pav. Int. potato center, Lima, Peru, p.55. Plant genet. Resources Inst., Rome, Italy.

Greenleaf, S. A. & Kremen, C. 2006a Wild bee species increase tomato production and respond differently to surrounding land use in Northern California. *Biol. Conserv.* in press, available online. (doi:10.1016/j.biocon.2006.05.025)

Greenleaf, S. A. & Kremen, C. 2006b Wild bees enhance honey bees' pollination of hybrid sunflower. *Proc. Nat. Acad. Sci. USA. 103, 13890-13895.* (doi:10.1073/pnas.0600929103)

Grewal G. S., Singh G., & Kandoria J. L. 1990 Insect pollinators of pigeonpea (*Cajanus cajan*) around Ludhiana. *Ind*. *J*. *Agric*. *Sci*. **60**, 227-228.

Griggs, W. H., Hartmann, H. T., Bradley, M. V., Iwakiri, B. T., Whisler, J. E. 1975 Olive pollination in California. *Bul. Calif. Agr. Exp. Sta* 869.

Gritton, E. T . 1980 Field pea. In *Hybridization of crop plants*. (ed. W. R. Fehr & H .H. Hadley) pp. 347-356. American Society of Agronomy & Crop Science Society fo America, Madison, WI, USA.

Gross, C. L. 1993 The reproductive ecology of *Canavalia rosea* (Fabaceae) on Anak Krakatau, Indonesia. *Aust. J. Bot.* **41**, 591-599.

Hagedoorn, K., Gross, C. L., Sedgley, M. & Keller, M. A. 1996 Increased Tomato Yield Through Pollination by Native Australian *Amegilla chlorocyanea* (Hymenoptera: Anthophoridae). *J. Econ. Entomol.* **99**, 828-833.

Hagerup, O. 1957 Wind autogamy in *Arbutus*. *Bull. Jardin Botanique de l'Etat, Bruxelles* **27**, 41-47.

Hamon, S. 1991 The reproductive biology of okra. 2. Self-fertilization kinetics in the cultivated okra (*Abelmoschus esculentus*), and consequences for breeding. *Euphytica* **53**, 49-55.

Hasan, S. M. Z & Razak, A. R. 1992 Parthenocarpy in seedless breadfruit (*Artocarpus incisus* (Thunb. L.) *Acta Hort.* **321**, 648-652.

Heard, T. A. 1993 Pollinator requirements and flowering patterns of *Macadamia integrifolia*. *Aust. J. Bot.* **41**, 491-497.

Heard, T. A. 1994 Behaviour and pollinator efficiency of stingless bees and honey bees on macadamia flowers. *J. Apic. Res.* **33**, 191-198.

Heard, T. A. 1999 The role of stingless bees in crop pollination. *Ann*. *Rev*. *Entomol*. **44**, 183-206.

Heard, T. A., Vithanage, V. & Chacko, E. K. 1990 Pollination biology of cashew in the Northern Territory of Australia. *Aust. J. Agric. Res.* **41**, 1101-1114.

Hedström, I. 1988 Pollen carriers and fruit development of *Psidium guajava* L. (Myrtaceae) in the neotropical region. *Rev. Biol. Trop.* **36**, 551-553.

Heiser, C. B 1972 The relationships of the naranjilla, *Solanum quitoense*. *Biotropica* **4**, 77-84.

Hennessy, E. F. F. 1991 Erythrinae (Fabacea) in Southern Africa. *Bothalia* **21**, 1-25.

Hermann, M. 1997 Arracacha (*Arracacia xanthorrhiza* bancroft). In *Andean roots and tubers: Ahipa, arracacha, maca and yacon* (ed. H. Hermann & J. Heller) pp.75-172. Institute of Plant Genetics and crop Plant Research, Gatersleben / International Plant genetic Resoruces Institute, Rome, Italy.

Herrera, C. M., Herrera, J. & Espadaler, X. 1984 Nectar thievery by ants from southern Spanish insect-pollinated flowers. *Insectes Soc*. **31**, 142-154.

Higo, H. A., Rice, N. D., Winston, M. L. & Lewis, B. 2004 Honey bee (Hymeoptera: Apidae) distribution and potential for supplementary pollination in commercial tomato greenhouses during winter. *J. Econ. Entomol.* **97**, 163-170.

Hokanson, K. & Hancock, J. 2000 Early-acting inbreeding depression in three species of *Vaccinium* (Ericaceae). *Sex. Plant Reprod.* **13**, 145-150.

Hogendoorn, K., Steen, Z. & Schwarz, M. P. 2000 Native Australian carpenter bees as a potential alternative to introducing bumble bees for tomato pollination in greenhouses. *J. Apic. Res.* **39**, 67-74.

Howard, H. W. & Lyon, A. G. 1952 *Nasturtium officinale* R. Br. (*Rorippa nasturtium-aquaticum* L. Hayek) *J. Ecol*. **40**, 228-245.

Howpage, D., Spooner- Hart, R. N. & Vithanage, V. 2001 Influence of honey bee (*Apis mellifera*) on kiwifruit pollination and fruit quality under Australian conditions. *New Zeal. J. Crop Hort.* **29**, 51-59.

Husin, A. & Abidin, M. Z. 1998 Durian. In *Tropical and subtropical fruits* (ed. P. E. Shaw, Jr., H. T Chan. & S. Nagy), pp. 261-289. AgScience, Auburndale, Florida.

Ibarra-Perez F. J., Barnhart D., Ehdaie B., Knio K. M., Waines J. G. 1999 Effects of insect tripping on seed yield of common beans. *Crop Sci*. **39**, 428-433.

Ish- Am, G. & Eisikowitch, D. 1993 The behaviour of honey bees (*Apis mellifera*) visiting avocado (*Persea americana*) flowers and their contribution to its pollination. *J. Apic. Res.* **32**, 175-186.

Ish- Am, G. & Eisikowitch, D. 1998a Low attractiveness of avocado (*Persea americana* Mill.) flowers to honeybees (*Apis mellifera* L.) limits fruit set in Israel. *J. Hort. Sci. Biotech.* **73**, 195-204.

Ish- Am, G. & Eisikowitch, D. 1998b Mobility of honey bees during foraging in avocado orchards. *Apidologie* **29**, 209-219.

Ish-Am, G., Barrientos-Priego, Fl, Castañeda-Vildozola, A. & Gazit, S. 1999 Avocado (*Persea americana* Mill) pollinators in its region of origin, Rev. *Chapingo Serie Hortic.* **5**, 137-143.

Ivancic, A., Lebot, V., Roupsard, O., Garcia, J.Q. & Okpui, T. 2004 Thermogenic flowering of taro (*Colocasia esculenta*, Araceae). *Can. J. Bot*. **82**, 1557-1565.

Jacob, V. J. 1980 Pollination, fruit setting and incompatibility in *Cola nitida*. *Incompatibility Newslett.* **12**, 50-56.

James D., Ariyanayagam R. P. & Duncan E. J. 1989 Effects of tripping flowers of four early varieties of pigeonpea (*Cajanus cajan* L. Millsp.). *J. Hort. Sci*. **64**, 243-247.

James, N. I. 1980 Sugarcane. In *Hybridization of crop plants* (ed. W. R. Fehr & H. H. Hadley) pp. 617- 629. American Society of Agronomy & Crop Science Society fo America, Madison, WI, USA.

Jarlan, A., De Oliveira, D. & Gingras, J. 1997a Pollination by *Eristalis tenax* (Diptera: syrphidae) and seed set of greenhouse sweet pepper. *J. Econ. Entomol.* **90**, 1646-1649.

Jarlan, A., De Oliveira, D. & Gingras, J. 1997b Effects of *Eristalis tenax* (Diptera: syrphidae) pollination on characteristics of greenhouse sweet pepper fruits *J. Econ. Entomol.* **90**, 1650-1654.

Javorek, S. K., Mackenzie, K. E. & Vander Kloet, S. P 2002 Comparative pollination effectiveness among bees (Hymenoptera: Apoidea) at lowbush blueberry (Ericaceae: V*accinium angustifolium* Ait.). *Ann. Entomol. Soc. Am.* **95**, 345-351.

Jicinska, D. 1976 Autogamy in various species of the genus *Rosa*. *Preslia* **48**, 225-229.

Jindal, K. K. & Sharma, G. 1997 Tropical fruits - mango, banana, papaya. In *Fruit crop pollination* (ed. L. R. Verma & K. K. Jindal), pp 279-297. Kalyani Pub., Ludhiana, India.

Jones, A. 1980. Sweet potato. In *Hybridization of crop plants* (ed. W.R. Fehr & H. H. Hadley) pp. 645-655. American Society of Agronomy & Crop Science Society of America, Madison, WI, USA.

Kakutani, T., Inoue, T., Tezuka, T. & Maeta, Y. 1993 Pollination of strawberry by the stingless bee, *Trigona minangkabau*, and the honey bee, *Apis mellifera*: an experimental study of fertilization efficiency. *Res. Popul. Ecol.* **35**, 95-111.

Kamenetsky, R. & Rabinowitch, H. D. 2001 Floral development in bolting garlic. *Sex Plant Reprod*. **13**, 235-241.

Kanchanapoom, K. & Kanchanapoom, M. 1998. Mangosteen. In *Tropical and subtropical fruits* (ed. P. E. Shaw, Jr. H. T Chan. & S. Nagy) pp. 191-215. AGSCIENCE, INC., Auburndale, Florida, USA.

Kato, E. C. & Nogueira-Couto, R. H. 2002 Polinização em melão (*Cucumis melo* L.) dos tipos amarelo e rendilhado. *Naturalia* **27**, 201-210.

Kaul, P., Sharma, N. & Koul, A. K. 1993 Pollination biology of Apiaceae. *Curr. Sci.* **65**, 219-222.

Kawano, K. 1980. Cassava. In *Hybridization of crop plants* (ed. W. R. Fehr & H. H. Hadley) pp. 225-233. American Society of Agronomy & Crop Science Society of America, Madison, WI, USA.

Kausch-Blecken von Schmeling, W. 1992 Der Speierling (*Sorbus domestica* L.) Arterhaltung durch Nachzucht, Goltze Druck GmbH & Co., Göttingen Germany, p. 219.

Kelly, B. A, Hardy, O. J, & Bouvet, J. M. 2004 Temporal and spatial genetic structure in *Vitellaria paradoxa* (shea tree) in an agroforestry system in southern Mali. *Mol. Ecol.* **13**, 1231-1240.

Kempler, C. & Kabaluk, T. 1996 Babaco (*Carica pentagona* Heilb.): A possible crop for the greenhouse. *HortScience* **31**, 785-788.

Kevan, P. G., Eisikowitch, D., Ambrose, J. D. & Demp, J. R. 1990 Cryptic dioecy and insect pollintion in *Rosa setigera* Michx. (Rosaceae), a rare plant of Carolinian Canada. *Biol. J. Linn. Soc.* **40**, 229-243.

Kevan, P. G. 2003 Pollination. In *Encyclopedia of rose science. Vol. 2.* (ed. A. V. Roberts, T. Debener & S. Gudin), pp. 456-460. Elsevier Academic Press, Oxford, United Kingdom.

Khan B. M., Shahid M., Chaudhry M. I. 1986 Effect of honey bee pollination on the fruit setting and yield of loquat. *Pakistan J. For.* **36**, 73-77.

Kill, L. H. P. & da Costa, J. G. 2003 Floral biology and reproductive system of *Annona squamosa* L. (Annonaceae) in Petrolina-PE, Brazil. *Cienc. Rural* **33**, 851-856.

Klein, A.-M., Steffan- Dewenter, I. & Tscharntke, T. 2003a Bee pollination and fruit set of *Coffea arabica* and *C. canephora* (Rubicacea). *Am. J. Bot.* **90**, 153-157.

Klein, A.-M., Steffan- Dewenter, I. & Tscharntke, T. 2003b Pollination of *Coffea canephora* in relation to local and regional agroforestry management. *J. Appl. Ecol.* **40**, 837-845. (doi:10.1046/j.1365-2664.2003.00847.x)

Klein, A.-M., Steffan- Dewenter, I. & Tscharntke, T. 2003c Fruit set of highland coffee increases with the diversity of pollinating bees. *P Proc. R. Soc. London B* **270**, 955-961. (doi:10.1098/rspb.2002.2306)

Knuth, P. 1908 Handbook of flower pollination, Vaolume II, Clarendon Press, Oxford.

Koelling, P. D., Kenworthy, W. J. & Caron, D. M. 1981 Pollination of male-sterile soybeans, *Glycine max*, in caged plots, *Crop Sci.* **21**, 559-561.

Koltowski, Z., Jablonski, B., Szklanowska, K. & Pluta, S. 1997 The influence of pollinating insects on the yield of more important new black currant cultivars (*Ribes nigrum* L.) *Pszczeln. Zesz. Nauk.* **41**, 19-31.

Koltowski, Z., Pluta, S., Jablonski, B. & Szklanowska, K. 1999 Pollination requirements of eight cutivars of black currant (*Ribes nigrum* L.). *J. Hort. Sci. Biotech.* **74**, 472- 474.

Koul, P., Sharma, N. & Koul A. K. 1993 Pollination biology of the Apiaceae. *Curr. Sci*. **65**, 219-222.

Krantz, G. W. & Poinar, G. O. 2004 Mites, nematodes and the multimillion dollar weevil. *J. Nat. Hist.* **38**, 135-141.

Kremen, C., Williams, N. M. & Thorp, R. W. 2002 Crop pollinaton from native bees at risk from agricultural intensification. *Proc. Nat. Acad. Sci. USA* **99**, 16812-16816.

Kremen, C., Williams, N. M., Bugg, R. L., Fay, J. P. & Thorp, R. W. 2004 The area requirements of an ecosystem service: crop pollination by native bee communities in California. *Ecol. Lett.* **7**, 1109-1119.

Kron, P., Husband, B. C., Kevan, P. G. & Belaoussoff, S. 2001 Factors affecting pollen dispersal in high-density apple orchards. *Hortscience* **36**, 1039-1046.

Lachenaud, P. 1994 Variations in the number of beans per pods in *Theobroma cacao* L. in the Ivory Coast. 1. the role of pollen. *J. Hort. Sci.* **69**, 1123-1129.

Ladizinsky G., Braun D., Goshen D. & Muehlbauer F. J. 1984 The biological species of the genus *Lens* L. *Bot. Gazette* **145**, 253-261.

Ladurner, E., Recla, L., Wolf, M., Zelger, R. & Burgio, G. 2004 *Osmia cornuta* (Hymenoptera Megachilidae) densities required for apple pollination: a cage study. *J. Apicult. Res.* **43**, 118-122.

Lakshmi, K. & Mohana Rao, G. 1998 Plants for bees – Guava. *Bee World* **79**, 135-137.

Langenberger, M. W. & Davis, A. R. 2002 Temporal changes in floral nectar production, reabsorption, and composition associated with dichogamy in annual caraway (*Carum carvi*; Apiaceae). *Am. J. Bot*. **89**, 1588-1598.

Larter, E. N. & Gustafson, J. P. 1980 Triticale. In *Hybridization of crop plants* (ed. W. R. Fehr & H. H. Hadley) pp. 681-694. American Society of Agronomy & Crop Science Society of America, Madison, WI, USA.

Le Guen, J., Mesquida, J., Pierre, J. S., Morin, G., Taséi, J. N. & Carré, S. 1993 Efficacité pollinisatrice de différents traitements sur 2 lignées de féverole de printemps (*Vicia faba* L. var. *equina* Steudel), à des niveaux d'autofertilité différents, avec utilisation de diverses espèces de *Bombus* Latr. (Hymenoptera: Apidae). *Apidologie* **24**, 129-145.

Lim, T. K & Luders, L. 1998 Durian flowering, pollination and incompatibility studies. *Ann. Appl. Biol.* **132**, 151-165.

Liu, X.H. & Ma, C.L. 2001 Production and research of longan in China. *Acta Hort*. **558**, 73-82.

Lughada, E. N. & Proenca, C. 1996 A survey of the reproductive biology of the Myrtoideae (Myrtaceae). *Ann. Missouri Bot. Gard*. **83,** 480-503.

Lumkin, D. 2005 Overcoming obstacles during 2005 almond pollination. *Am. Bee J.* **145**, 290-294.

Maccagnani, B., Ladurner, E., Santi, F. & Burgio, G. 2003 *Osmia cornuta* (Hymenoptera, Megachilidae) as a pollinator of pear (*Pyrus communis*): fruit- and seed-set. *Apidologie* **34**, 207-216. (doi:10.1051/apido:2003009)

Maeta, Y., Tezuka, T., Nadano, H. & Suzuki, K. 1992 Utilization of the Brazilian stingless bee, *Nannotrigona testaceicornis*, as a pollinator of strawberries. *Honeybee Sci.* **13**, 71-78.

Malagodi-Braga, K. S. & Kleinert, A. M. P. 2004 Could *Tetragonisca angustula* Latreille (Apinae, Meliponini) be effective as strawberry pollinator in greenhouses? *Aust. J. Agr. Res.* **55**, 771-773.

Malerbo-Souza, D. T. & Nogueira-Couto, R. H. 1997 Atrativo para as abelhas *Apis mellifera* e polinização em café (*Coffea arabica* L.) *Mensagem Doce* **44**, 6-11.

Manino, A., Patetta, A. & Marletto, F. 1991 Investigations on chesnut pollination. *Acta Hort*. **288**, 335-339.

Manning, R. & Boland, J. 2000 A preliminary investigation into honey bee (*Apis mellifera*) pollination of canola (*Brassica napus* cv. Karoo) in Western Australia. *Aust. J. Exp. Agr.* **40**, 439-442.

Manrique, A. J. & Thimann, R. E. 2002 Coffee pollination with africanized honeybees in Venezuela. *Interciencia* **27**, 414- 416.

Maroto, J. V., Miguel, A., Lopez-Galarza, S., San Bautista, A., Pascula, B., Alagarda, J. & Guardiola, J. L. 2005 Parthenocarpic fruit set in triploid watermelon induced by CPPU and 2,4-D applications. *Plant Growth Reg*. **45**, 209-213.

Mars, M. & Marrakchi, M. 2004 Dynamique de floraison et régime de reproduction chez le grenadier (*Punica granatum* L.) en Tunisie. *Fruits* **59**, 39-48. (doi:10.1051/fruits :2004005)

Maués, M. M. 2002 Reproductive phenology and pollination of the Brazil nut tree (*Bertholletia excelsa* Humb. & Bonpl. Lecythidaceae) in Eastern Amazonia. In *Pollinating bees - the conservation link between agriculture and nature.* (ed. P. Kevan & V. L. Imperatriz Fonseca) pp. 245-254. Ministry of Environment, Brasilia, Brazil.

Mayfield, M. M. 2005 The importance of nearby forest to known and potential pollinators of oil palm (*Elaeis guineensis* Jacq.; Arecaceae) in Southern Costa Rica. *Econ. Bot.* **59**, 190–196.

McGregor, S. E. 1976 Insect pollination of cultivated crop plants. Washington (DC). US Departement of Agriculture, *Agricultural Handbook* 496. http://gears.tucson.ars.ag.gov/book/index.html

McLaren, G. F., Fraser, J. A., Grant, J. E. 1995 Pollination compatibility of apricots grown in central Otago, New Zealand. *Acta Hort.* **384**, 385-390.

Mcphee K. E. 2003 Dry pea production and breeding - a mini-review. *Food Agric. Environ*. 1, 64-69.

Mehta, K. & Kashyap, A. S. 1997 Persimmon. In *Fruit crop pollination.* (ed. Verma, L. R. & Jindal, K. K.) pp. 205-211. Kalyani Pub., Ludhiana, Indiah.

Meisels, S. & Chiasson, H. 1997 Effectiveness of *Bombus impatiens* Cr. as pollinators of greenhouse sweet peppers (*Capsicum annuum*). *Acta Hort*. **437**, 425-429.

Meléndez-Ramírez, V., Parra-Tabla, V., Kevan, P. G., Ramírez-Morillo, I., Harries, H., Fernández-Barrera, M. & Zizumbo-Villareal, D. 2004 Mixed mating strategies and pollination by insects and wind in coconut palm (*Cocos nucifera* L. (Arecaceae)): importance in production and selection. *Agr*. *Forest Entomol*. **6**, 155-163.

Melgarejo, P., Legua, P., Martinez, M. & Martinez, J. J. 2000 Contribution to a better knowledge of the quality of pomegranante pollen (*Punica granatum* L.) *Options Méditerr. A.* **42**, 115-121.

Mickelbart, M.V. 1996 Sapodilla: A potential crop for subtropical climates. In *Progress in new crops*. (ed. J. Janick). pp 439-446. ASHS Press, Alexandria, VA.

Millogo-Rasolodimby, J. 1989 Importance apicole du karité, *Butyrospermum paradoxum* (Gaertn. Hepper) et du néré, *Parkia biglobosa* (Jacq. Benth.) *Rev. Française d'Apiculture* **482**, 72-74.

Miura, T. 1982 The hourly change of the pollinator association found in the Japanese persimmon, *Diospyros kaki* cultivar Saijo orchard during daytime. *Bulletin of the Faculty of Agriculture, Shimane University*, 166-171.

Moncur, M. W. 1985 Floral ontogeny of the jackfruit, *Artocarpus heterophyllus*. *Aust. J. Bot*. **33**, 585-593.

Monzón, V. H., Bosch, J. & Retana, J. 2004 Foraging behaviour and pollinating effectiveness of *Osmia cornuta* (Hymenoptera: Megachilidae) and *Apis mellifera* (Hymenoptera: Apidae) on “Comice” pear. *Apidologie* **35**, 575- 585. (doi:10.1051/apido:2004055)

Morandin, L. A., Laverty, T. M. & Kevan, P. G. 2001 Bumble bee (Hymenoptera: Apidae) activity and pollination levels in commercial tomato greenhouses. *J. Econ. Entomol.* **94**, 462-467.

Morandin, L. A. & Winston, M. L. 2005 Wild bee abundance and seed production in conventional organic, and genetically modified canola. *Ecol. Appl.* **15**, 871-881.

Moreti, A. C. de C. C., da Silva, E. C. A. & Alves, M. L. T. M. F. *et al. 1998 Observações sobre a poinização entomófila da cultura da soja (Glycine max Merril). Boletim da indústria Animal* **55**, 91-94.

Moreti, A. C. de C. C., da Silva, R. M. B., da Silva, E. C. A. *et al.* 1996 Aumento na produção de sementes de girassol (Helianthus annuus) Pela ação de insetos polinizadores. *Sci. Agric*. **53**, 280-284.

Morey, D. D. & Barnett, R. D. 1980 Rye. In *Hybridization of crop plants* (ed. W. R. Fehr & H. H. Hadley) pp. 523-534. American Society of Agronomy & Crop Science Society of America, Madison, WI, USA.

Mori, S. A. & Prance, G. T. 1990 Taxonomy, ecology, and economic botany of the Brazil nut (*Bertholletia excelsa* Humb. & Bonpl.: Lecythidaceae). *Adv. Econ. Bot.* **8**, 130-150.

Morton, J. F. 1987 *Fruits of warm climates*. Creative Resource Systems, Inc., Winterville, NC.

Mutsaers, M. 1993 Natural pollination of banana and plantain at Onne. *MusAfrica* **2**, 2-3.

Nadel, H. & Pena, J. E. 1994 Identity, behaviour, and efficacy of nitidulid beetles (Coleoptera: Nitidulidae) pollinating commercial *Annona* species in Florida. *Environ. Entomol.* **23**, 878-886.

Nadgauda, R. S., John, C. K., Parasharami, V. A., Joshi, M. S. & Mascarenhas A. F. 1997 A comparison of in vitro with in vivo flowering in bamboo: *Bambusa arundinacea*. *Plant Cell Tissue Organ Culture* **48**, 181-188.

Németh, E., Bernath, J. & Petheo, F. 1999 Study on flowering dynamic and fertilization properties of caraway and fennel. *Acta Hort.* **502**, 77-83.

Németh, E. & Székely, G. 2000 Floral biology of medicinal plants. I. Apiaceae species. *International Journal of Horticultural Science* **6**, 133-136.

Nepi, M. & Paccini, E. 1993 Pollination, pollen viability, and pistil receptivity in *Curcurbita pepo*. *Ann*. *Bot*. **72**, 527-536.

Njoroge, G. N., Gemmill, B., Bussmann, R., Newton, L. E. & Ngumi, V. W. 2004 Pollination ecology of *Citrullus lanatus* at Yatta, Kenya. *Int*. *J*. *Trop*. *Insect Sci*. **24**, 73-77.

Nogueira-Couto, R. H., Pereira, J. M. S & De Jong, D. 1998 Pollination of *Glycine wightii*, a perennial soybean, by Africanized honey bees. *J. Apicult. Res.* **3**, 289-291.

Norden, B. M. B. 1985 The comparative importance of small carpenter bees (*Ceratina* spp.) and other insects to pollination of muskmelon/cantaloupe (*Cucumis melo* L.) in Maryland. Ph.D. dissert., Univ. Maryland.

Nyéki, J. & Soltész, M. 2003 Pear (*Pyrus communis* L.). In *Floral biology, pollination and fertilisation in temperate zone fruit species and grape* (ed. P. Kozma, J. Nyéki, M. Soltész & Z. Szabó) pp. 317-331. Akadémiai Kiadó, Budapest, Hungary.

Nyéki, J., Szabó, Z. & Soltész, M. 2003a Sweet cherries (*Prunus avium* L.). In *Floral biology, pollination and fertilisation in temperate zone fruit species and grape* (ed. P. Kozma, J. Nyéki, M. Soltész & Z. Szabó) pp. 341-358. Akadémiai Kiadó, Budapest, Hungary.

Nyéki, J., Szabó, Z. & Soltész, M. 2003b Sour cherries (*Prunus cerasus* L.). In *Floral biology, pollination and fertilisation in temperate zone fruit species and grape* (ed. P. Kozma, J. Nyéki, M. Soltész & Z. Szabó) pp. 359-382.Akadémiai Kiadó, Budapest, Hungary.

O'Malley, D. M., Buckley, D. P., Prance, G. T. & Bawa, K. W. 1988 Genetics of Brazil nut (*Bertholletia excelsa* Humb. & Bonpl.: Lecythidacea). 2. Mating system. *Theoretical and Applied Genetics* ***76***, 929-932.

Osei, J. K. 1995-1996 Fruit setting from natural pollination and the yield of nine-year-old cross-compatible *Cola nitida* clones. *Ghana J. Agric. Sci.* **28-29**, 95-98.

Patterson, K. J. 1990 Effects of pollination on fruit set, size, and quality in feijoa. *New Zeal. J. Crop Hort.* **18**, 127-131.

Payne, J. A., Cane, J. H., Amis, A. A. & Lyrene, P. M. 1989 Fruit size, seed size, seed viability and pollination of rabbiteye blueberries (*Vaccinium ashei* Reade). *Acta Hort.* **241**:38-43.

Pelletier, L., Brown, A., Otrysko, B. & McNeil, J. N. 2001 Entomophily of the cloudberry (*Rubus chamaemorus*). *Entomol. Expt. Appl.* **101**, 219-224.

Peña, J. E., Castiñeiras, A., Bartelt, R. & Duncan, R. 1999 Effect of pheromone bait stations for sap beetles (Coleoptera: Nitidulidae) on *Annona* spp. fruit set. *Florida Entomol*. **82**, 475-480.

Petanidou, T. & Vokou, D. 1990 Pollination and pollen energetics in Mediterranean ecosystems. *Am. J. Bot*. **77**, 986-992.

Phipps, J. 2003 *Hawthorns and medlars*. 180 pp. Timber Press, Portland, OR, USA.

Pías, B. & Guitián, P. 2006 Breeding system and pollen limitation in the masting tree *Sorbus aucuparia* L. (Rosaceae) in the NW Iberian Peninsula. *Acta Oecol.* **29**, 97-103.

Piatos, P. & Knight, R. J. 1975 Self-incompatibility in the sapodilla. *Proc. Florida State Hort. Soc*. **88**, 464-465.

Pierre, J., Suso, M. J., Moreno, M. T., Esnault, R. & Le Guen, J. 1999 Diversité et efficacité de l'entomofaune pollinisatrice (Hymenoptera: Apidae) de la féverole (*Vicia faba* L.) sur 2 sites, en France et en Espagne. *Ann. Soc. Entomol. Fr*. **35** (suppl.), 312-318.

Pinzauti, M., Lazzarini, D. & Felicioli, A. 1997 Preliminary investigation of *Osmia cornuta* Latr. (Hymenoptera, Megachilidae) as a potential pollinator for blackberry (*Rubus fruticosus* L.) under confined environment. *Acta Hort.* **427**, 329-333.

Plaisted, R. L. 1980 Potato. In *Hybridization of crop plants* (ed. W. R. Fehr & H. H. Hadley) pp. 483-494. American Society of Agronomy & Crop Science Society of America, Madison, WI, USA.

Pomper, K .W., Layne, D. R., Peterson, R. N. & Wolfe, D. 2003 The pawpaw regional variety trial: background and early data. *HortTechnology* **13**, 412-417.

Pouvreau, A. 1984 Production de semences potagères In *Pollinisation et productions végétales* (ed. P. Pesson & J. Louveaux) pp 471-495. INRA, Paris, France.

Raccuia, S. A., Mainolfi, A., Mandolino, G. & Melilli, M. G. 2004 Genetic diversity in *Cynara cardunculus* revealed by AFLP markers: comparsion between cultivars and wild types from Sicily. *Plant Breed.* **123**, 280-284.

Rana, H. S. & Divedi, M. P. 1997 Pomegranate. In *Fruit crop pollination* (ed. L. R Verma & K. K. Jindal) pp. 331-344. Kalyani Pub., Ludhiana, India.

Ragone, D. 1997 Breadfruit *Artocarpus altilis* (Parkinson) Fosberg. Promoting the conservation and use of underutilized and neglected crops. 10. IPK, Gatersleben, Germany / IPGRI, Rome, Italy. 77 p.

Ramirez, N. 2004 Ecology of pollination in a tropical Venezuelan savanna. *Plant Ecol.* **173**, 171-189.

Rasmont, P., Regali, A., Ings, T. C., Lognay, G., Baudart, E., Marlier, M., Delcarte, E., Viville, P., Marot, C., Falmagne, P., Verhaeghe, J. C. & Chittka, L. 2005 Analysis of pollen and nectar of *Arbutus unedo* as a food source for *Bombus terrestris* (Hymenoptera: Apidae). *J. Econ. Entomol.* **98**, 656-663.

Raspé, O. 1998 Biologie de la reproduction et variation genetique d'un arbre entomophile: *Sorbus aucuparia* L. (Rosaceae: Maloideae). PhD Thesis, Universite catho- lique de Louvain, Belgium.

Raw, A. 2000 Foraging behavior of wild bees at hot pepper flowers (*Capsicum annuum*) and its possible influence on cross pollination. *Ann. Bot.* **85**, 487- 492.

Ray, J. D., Kilen, T. C., Abel, C. A. & Paris, R. L. 2003 Soybean natural cross-pollination rates under field conditions. *Environ. Biosafety Res.* **2**,133-138.

Reddi, E .U. B. 1989 Thrips pollination in sapodilla (*Manilkara zapota*). *Proc. Indian Nat. Sci. Acad.* B **55**, 407-410.

Reiter, R. 1947 The coloration of anther and corbicular pollen. *Ohio J. Sci*. **47**, 137-152.

Rhodes, J. 2002 Cotton pollination by honey bees. *Aust. J. Exp. Agric.* **42**, 513-518.

Ricciardelli D'Albore, G. C. 1986 The pollinating insects of some Umbelliferae of agricultural and herbal interest (*Angelica archangelica* L., *Carum carvi* L., *Petroselinum crispum* A.W. Hill, *Apium graveolens* L., *Pimpinella anisum* L., *Daucus carota* L., *Foeniculum vulgare* Miller V. *azoricum* Thell.) *Apidologie* **17**, 107-124.

Richards, A. J. 2001 Does low biodiversity resulting from modern agricultural practice affect crop pollination and yield? *Ann*. Bot. **88**, 165-172.

Richards, A. J. 1990 Studies in *Garcinia*, dioecious tropical forest trees: the origin of the Mangosteen. *Bot. J. Linn. Soc.* **103**, 301-308.

Ricketts, T. H. 2004 Tropical forest fragments enhance pollinator activity in nearby coffee crops. *Conserv. Biol.* **18**, 1262-1271.

Ricketts, T. H., Daily, G. C., Ehrlich, P. R. & Michener, C. D. 2004 Economic value of tropical forest to coffee production. *Proc. Nat. Acad. Sci. USA* **101**, 12579-12582.

Robertson, C. 1923 Flowers and insects XXII. *Bot. Gaz*. **75**, 60-74.

Rohrer, J. R., Robertson, K. R., Phipps, J. B. 1994 Floral morphology of Maloideae (Rosaceae) and its systematic relevance. *Am. J. Bot.* **81**, 574-581.

Ronnie Coffman, W. & Herrera, R. M. 1980 Rice. In *Hybridization of crop plants* (ed. W. R. Fehr & H. H. Hadley) pp. 511-522. American Society of Agronomy & Crop Science Society of America, Madison, WI, USA.

Roubik, D. W. 1995 Pollination of cultivated plants in the tropics. Food and Agriculture Organization of the United Nations, Rome. Bull. 118. Italy.

Roubik, D. W. 2002a Feral African bees augment neotropical coffee yield. In *The conservation link between agriculture and nature* (ed. P. G. Kevan & Imperatriz-Fonseca, V. L.), pp. 255-266. Ministry of Environment: Secretariat for Biodiversity and Forests, Brazil.

Roubik, D. W. 2002b The value of bees to the coffee harvest. *Nature* **417**, 708.

Russell, W. A. & Hallauer, A. R. 1980 Corn. In *Hybridization of crop plants* (ed. W. R. Fehr & H. H. Hadley) pp. 299-312. American Society of Agronomy & Crop Science Society of America, Madison, WI, USA.

Routley, M. B., Kron, P. & Husband, B. C. 2004 The consequences of clone size for paternal and maternal success in domestic apple (*Malus domestica*). *Am. J. Bot.* **91**, 1326-1332.

Sakai, S., Kato, M. & Nagamasu, H. 2000 *Artocarpus* (Moraceae) - Gall midge pollination mutualism mediated by a male-flower parasitic fungus. *Am. J. Bot.* **87**, 440-445.

Salakpetch, S., Chandraparnik, S. & Hiranpradit, H. 1992 Pollen grains and pollination in Durian, *Durio zibethinus* Murr. *Acta Hort.* **321**, 636-640.

Sampson, B. J. & Cane J. H. 2000 Pollination efficiencies of three bee (Hymenoptera: Apoidea) species visiting rabbiteye blueberry. *J. Econ. Entomol.* **93**, 1726-1731.

Sampson, B. J., Danka, R. G. & Stringer, S. J. 2004 Nectar robbery by bees *Xylocopa virginica* and *Apis mellifera* contributes to the pollination of rabbiteye blueberry. *J. Econ. Entomol.* **97**, 735-740.

Sampson, B., Noffsinger, S., Gupton, C. & Magee, J. 2001 Pollination biology of the muscadine grape. *Hortscience* **36**, 120-124.

Sampson, B. J., Stringer, S. J., Cane, J. H. & Spiers, J. M. 2004 Screenhouse evaluations of a mason bee *Osmia ribifloris* (Hymenoptera: Megachilidae) as a pollinator of blueberries in the southeastern United States. *Small Fruits Review* **3**, 381-392.

Sanford, M. T. 2003 Pollination of citrus by honey bees. FRAA092, Florida Cooperative Extension Service. Instiute of Food and Agricultural Sciences, University of Florida, Florida. available at http://edis.ifas.ufl.edu/pdffiles/AA/AA09200.pdf

Sanou H., Lovett P. N. & Bouvet J. M. 2005 Comparison of quantitative and molecular variation in agroforestry populations of the shea tree (*Vitellaria paradoxa* C.F. Gaertn) in Mali. *Mol. Ecol.* **14**, 2601-2610.

Sargent, R. D. & Otto, S. P. 2004 A phylogenetic analysis of pollination mode and the evolution of dichogamy in angiosperms. *Evol*. *Ecol*. **6**,1183-1199.

Sasikumar, B., Krishnamoorthy, B., Saji, D. V., Johnson, K. G, Peter, K. V. & Ravindran, P. N. 1999 Spice diversity and conservation of plants that yield major spices in India. *Plant Genetic Resources Newsletter* **118**, 19-26.

Schertz, K. F. & Dalton, L. G. 1980 Sorghum. In *Hybridization of crop plants* (ed. W. R. Fehr & H. H. Hadley) pp. 577-588. American Society of Agronomy & Crop Science Society of America, Madison, WI, USA.

Schittenhelm, S., Gladis, T. & Rao, V. R. 1997 Efficiency of various insects in germplasm regeneration of carrot, onion and turnip rape accessions. *Plant Breed.* **116**, 369-375.

Schroeder, C. A. 1953 The pollination of some subtropical fruit trees. *Lasca Leaves* **3**, 39-41.

Sealy, J. R. 1949 *Arbutus unedo*. *J. Ecol.* **37**, 365-388.

Segnou, C. A., Fatokun, C. A., Akoroda, M. O. & Hahn, S. K. 1992 Studies on the reproductive biology of white yam (*Dioscorea rotundata* Poir). *Euphytica* **64**, 197-203.

Sekita, N. 2001 Managing *Osmia cornifrons* to pollinate apples in Aomori Perfecture, Japan. *Acta Hort.* **561**, 303-307.

Sekita, N. & Amada, Y. 1993 Use of *Osmia cornifrons* to pollinate apples in Aomori Prefecture, Japan. *Japan Agricultural Research Quarterly* **26**, 264-270.

Sharma, H. K., Gupta, J. K. & Thakur, J. R. 2004 Effect of bee pollination and polliniser proportion on apple productivity. *Acta Hort.* **662**, 451-454.

Sharma, G. & Jindal, K. K. 1997 Sub-tropical fruits - Citrus, Litchi, Ber, Guava, Sapota, Jamun, Loquat, Aonla, Fig. In *Fruit crop pollination* (ed. L. R.Verma & K. K. Jindal), pp. 298-330. Kalyani Pub., Ludhiana, India.

Shipp, J. L., Whitfield, G. H., Papadopoulos, A. P. 1994 Effectiveness of the bumble bee *Bombus impatiens* Cr. (Hymenoptera: Apidae), as a pollinator of greenhouse sweet pepper. *Sci. Hortic.* **57**, 29-39.

Simmonds, N. W. 1965 The grain chenopods of the tropical American highlands. *Econ. Bot.* 19, 223-235.

Simmonds, N. W. 1971 The breeding system of *Chenopodium quinoa*. Male sterility. *Heredity* **27**, 73-82.

Singh, R.P. 1997 Olive In *Fruit crop pollination* (ed. L. R.Verma & K. K. Jindal), pp. 212-224. Kalyani Pub., Ludhiana, India.

Slaa, E. J., Sánchez, C. L. A., Malagodi-Braga, K. S. & Hofstede, F. E. 2006 Stingless bees in applied pollination. Practice and perspectives. *Apidologie* **37**, 293-315. (doi:10.1051/apido:2006022)

Smith, G. A. 1980 Sugarbeet. In *Hybridization of crop plants* (ed. W.R. Fehr & H. H. Hadley) pp. 601-616. American Society of Agronomy & Crop Science Society of America, Madison, WI, USA.

Soltész, M. 2003 Apple (*Malus sylvestris* (L.) Mill). In *Floral biology, pollination and fertilisation in temperate zone fruit species and grape* (ed. P. Kozma, J. Nyéki, M. Soltész & Z. Szabó) pp 237-316. Akadémiai Kiadó, Budapest, Hungary.

Soltész, M., Nyéki, J. & Szabó Z. 2003a Almond (*Amygdalus communis* L.). In *Floral biology, pollination and fertilisation in temperate zone fruit species and grape* (ed. P. Kozma, J. Nyéki, M. Soltész & Z. Szabó) pp. 435-449. Akadémiai Kiadó, Budapest, Hungary.

Soltész, M., Nyéki, J. & Szabó, Z. 2003b *Ribes* species. In *Floral biology, pollination and fertilisation in temperate zone fruit species and grape* (ed. P. Kozma, J. Nyéki, M., Soltész & Z. Szabó) pp. 499-513. Akadémiai Kiadó, Budapest, Hungary.

Somerville, D. C. 1999. Honeybees (*Apis mellifera* L.) increase yields of faba beans (*Vicia faba* L.) in New South Wales while maintaining adequate protein requirements from faba bean pollen. *Austral. J. Exp. Agric.* **39**,1001-1005.

Spalik, K. 1996 Species boundaries, phylogenetic relationships, and ecological differentation in *Anthriscus* (Apiaceae). *Plant Syst. Evol.* **199**, 17-32.

Sperens, U. 1996 Is fruit and seed production in *Sorbus aucuparia* L. (Rosaceae) pollen-limited? *Ecoscience* **3**, 325-329.

Stanghellini, M. S., Ambrose, J. T. & Schultheis, J. R. 1998 Seed production in watermelon: a comparison between two commercially available pollinators. *HortScience* **33**, 28-30.

Stanghellini, M. S., Ambrose, J. T. & Schultheis, J. R. 1997 The effects of honey bee and bumble bee pollination on fruit set and abortion of cucumber and watermelon. *Am. Bee J.* ***137***, 386-391.

Stanghellini, M. S., Ambrose, J. T. & Schultheis, J. R. 2002 Diurnal activity, floral visitation and pollen deposition by honey bees and bumble bees on field-grown cucumber and watermelon. *J. Apic. Res.* **41**, 27-34.

Starling, T. M. 1980 Barley. In *Hybridization of crop plants* (ed. W. R. Fehr & H. H. Hadley) pp. 189-202. American Society of Agronomy & Crop Science Society of America, Madison, WI, USA.

Stern, R. A., Eisikowitch, D. & Dag, A. 2001 Sequential introduction of honeybee colonies and doubling their density increases cross-pollination, fruit-set and yield in 'Red Delicious' apple *J. Hortic. Sci. Biotech.* **76**, 17-23.

Stern, R. A. & Gazit, S. 1996 Lychee pollination by the honeybee. *J. Am. Soc. Hort. Sci.* **120**, 152-157.

Stern, R. A., Goldway, M., Zisovich, A. H., Shafir, S. & Dag, A. 2004 Sequential introduction of honeybee colonies increases cross-pollination, fruit-set and yield of 'Spadona' pear (*Pyrus communis* L.). *J. Hortic. Sci. Biotech.* **79**, 652- 658.

Stewart, A. M. 1989 Factors affecting pollinator effectiveness in *Feijoa sellowiana. New Zeal. J. Crop Hort.* **17**, 145-154.

Stewart, A. M. 1984 Studies on the pollination biology of an introduced crop *Feijoa sellowiana. New. Zeal. J. Ecol.* **7**, 203-204.

Stougaard, B. 1983 Pollination in *Rosa multiflora. Tisskrift for planteavl.* **87**, 633-642.

Stubbs, C. S. & Drummond, F. A. 2001 *Bombus impatiens* (Hymenoptera: Apidae): An alternative to *Apis mellifera* (Hymenoptera: Apidae) for lowbush blueberry pollination. *J. Econ. Entomol.* **94**, 609-616.

Stubbs, C. S. & Drummond, F. A. 1999 Pollination of lowbush blueberry by *Anthophora pilipes villosula* and *Bombus impatiens* (Hymenoptera: Anthophoridae and Apidae). *J. Kan. Entomol. Soc.* **72**, 330-333.

Suso, M. J., Moreno, M. T., Mondragao-Rodrigues, F. & Cubero, J. I. 1996 Reproductive biology of *Vicia faba*: role of pollination conditions. *Field Crops Res*. **46**, 81-91.

Szabó, Z. 2003. Plum (*Prunus domestica* L.) 2003 In *Floral biology, pollination and fertilisation in temperate zone fruit species and grape* (ed. P. Kozma, J. Nyéki, M., Soltész & Z. Szabó) pp. 383-410. Akadémiai Kiadó, Budapest, Hungary.

Szabó, Z., Nyéki, J. & Soltész, M. 2003a Apricot (*Prunus armeniaca* L.). In *Floral biology, pollination and fertilisation in temperate zone fruit species and grape* (ed. P. Kozma, J. Nyéki, M., Soltész & Z. Szabó) pp. 411-423. Akadémiai Kiadó, Budapest, Hungary.

Szabó, Z., Nyéki, J. & Soltész, M. 2003b Peaches (*Prunus persica* (L.) Batsch). In *Floral biology, pollination and fertilisation in temperate zone fruit species and grape* (ed. P. Kozma, J. Nyéki, M., Soltész & Z. Szabó) pp. 425-434. Akadémiai Kiadó, Budapest, Hungary.

Tandon, R., Manohara, T. N., Nijalingappa, B. H. M. & Shivana, K. R. 2001 Pollination and pollen-pistil interaction in oil palm, *Elaeis guineensis*. *Ann*. *Bot*. **87**, 831-838.

Tayyar, R. I., Nguyen, J. H. T. & Holt, J. S. 2003 Genetic and morphological analysis of two novel nutsedge biotypes from California. *Weed Sci.* **51**, 731-739.

Tchuenguem Fohouo, F. N., Mapongmetsem, P. M., Hentchoya Hemo, J. & Messi, J. 2005 Exploitation des fleurs de quatre plantes oleagineused par *Apis mellifera angaundere* (Cameroun): *Bombax pentandrum*, *Vitellaria paradoxa*, *Lophira lanceolata* et *Dacryodes edulis*. Procédés Biologiques et Alimentaires: http://spip.cm.refer.org/pba1/article51.html

Thakur, B. S. & Thakur K. S. 1997 Grapes. In *Fruit crop pollination* (eds. L.R. Verma LR & K.K. Jindal) pp. 241-249. Kalyani Pub., Ludhiana, India.

Thien, L. B., White, D. A. & Yatsu. L. Y. 1983 The reproductive biology of a relict – *Illicium floridanum* Ellis. *Am. J. Bot.* **70**, 719-727.

Thomson, J. D. & Goodell, K. 2001 Pollen removal and deposition by honeybee and bumblebee visitors to apple and almond flowers. *J. Appl. Ecol.* **38**, 1032-1044.

Torre Grossa, J. P., Vaissière, B. E, Rodet, G., Botella, L. & Cousin, M. 1994 Pollination needs of the self-compatible almond cultivar 'Lauranne' *Acta Hort.* **373**, 145-152.

Trognitz, B. R., Hermann, M. & Carrión, S. 1998 Germplasm conservation of oca (*Oxalis tuberosa* Mol.) through botanical seed. Seed formation under a system of polymorphic incompatibility. *Euphytica* **101**, 133-141.

Trognitz, B. R., Carrión, S. & Hermann, M. 2000 Expression of stylar incompatibility in the Andean clonal tubar crop oca (*Oxalis tuberosa* Mol., Oxalidaceae). *Sex. Plant Reprod*. **13**, 105-111.

Trognitz, B. R. & Hermann, M. 2001 Inheritance of tristyly in *Oxalis tuberosa* (Oxalidaceae). *Heredity* **86**,564-573.

Ueda, Y. & Akimoto, S. 2001 Cross- and self-compatibility in various species of the genus Rosa. *J. Hort. Sci. Biotechnol.* **76**, 392-395.

Vaissière, B. E., Morison, N. & Subirana, M. 2004 Ineffectiveness of pollen dispensers to improve apricot pollination. *Acta Hort*. **701**, 635-640.

Vaissière, B. E., Rodet, G., Cousin, M., Botella, L. & Grossa, J . P. T. 1996 Pollination effectiveness of honey bees (Hymenoptera: Apidae) in a kiwifruit orchard. *J. Econ. Entomol.* **89**, 453- 461.

Valantin-Morison, M., Vaissière, B. E., Gary, C. & Robin, P. 2006 Source-sink balance affects reproductive development and fruit quality in cantaloupe melon (*Cucumis melo* L.) *J. Hort. Sci. Biotechnol.* **81**, 105-117.

Vaz, G. V., De Olivera, D. & Ohashi, O. S. 1998 Pollinator contribution to the production of cowpea on the Amazon. *Hortscience* **33**, 1157-1159.

Vicens, N. & Bosch, J. 2000 Pollinating efficacy of *Osmia cornuta* and *Apis mellifera* (Hymenoptera: Megachilidae, Apidae) on 'red Delicious' apple. *Environ. Entomol.* **29**, 235-240.

Vithanage, V. 1990 The role of the European honeybee (*Apis mellifera* L.) in avocado pollination, *J. Hort. Sci.* **65**, 81-86.

Wallace, H. M. & Lee, L. S. 1999 Pollen source, fruit set and xenia in mandarins. *J. Hortic. Sci. Biotech.* **74**, 82-86.

Wallace, H. M., Vithanage, V. & Exley, E. M. 1996 The effect of supplementary pollination on nut set of Macadamia (Proteaceae). *Ann. Bot.* **78**, 765-773.

Watson, L. E., Bates, P. L., Evans, T. M., Unwin, M. M. & Estes, J. R. 2002 Molecular phylogeny of subtribe Artemisiinae (Asteraceae), including Artemisia and its allied and segregate genera. http://www.biomedcentral.com/1471-2148/2/17

Westerkamp, C. & Gottsberger, G. 2000 Diversity pays in crop pollination. *Crop Sci.* **40**, 1209-1222.

Wei, S. G., Wang, R. Smirle, M. J. & Xu, H. L. 2002 Release of *Osmia excavata* and *Osmia jacoti* (Hymenoptera : Megachilidae) for apple pollination. *Can. Entomol.* **134**, 369-380.

Weiss, J., Nerd, A., & Mizrahi, Y. 1993 Vegetative parthenocarpy in the cactus pear *Opuntia ficus-indica* (L.) Mill. *Ann. Bot.* **72**, 521-526.

Westcott, L. & Nelson, D. 2001 Canola pollination: an update. *Bee World* **82**,115-129.

Wieble, J., Chacko, E. K. & Downton, W. J. S. 1992 Mangosteen (*Garcinia mangostana* L.) A potential crop for tropical northern Australia. *Acta Hort.* **321**,132-137.

Willmer, P. G., Bataw, A. A. M. & Hughes, J. P. 1994 The superiority of bumble bees to honeybees as pollinators – Insect visits to raspberry flowers. *Ecol. Entomol.* **19**, 271-284.

Willson, M. F. & Schemske, D. W. 1980 Pollinator limitation, fruit production, and floral display in pawpaw (*Asimina triloba*). *Bull. Torr. Bot. Club* **107**, 401-408.

Witter, S. & Blochtein, B. 2003 Effect of pollination by bees and other insects on the production of onion seeds. *Presquisa Agropecuaria Brasileira* **38**, 1399-1407.

Wodehouse, R. P. 1931 Pollen grains in the identification and classification of plants. VI. Polygonaceae. *Am. J. Bot.* **18**, 749-764.

Yaacob, O. & Subhadrabandhu, S. 1995 The production of economic fruits in South-east Asia. Oxford Univ. Press, Oxford, UK.

Yeboah Gyan, K. & Woodell, S. R. J. 1987 Analysis of insect pollen loads and pollination efficiency of some common insect visitors of four species of woody Rosaceae. *Funct. Ecol.* **1**, 269-274.

Zebrowska, J. 1998 Influence of pollination modes on yield components on strawberry (*Fragaria x ananassa* Duch.). *Plant Breed.* **117**, 255-260.