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Evaluation of *Lonicera* Taxa for Honeysuckle Aphid Susceptibility, Winter Hardiness and Use¹

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Abstract

One-hundred-thirty-five honeysuckle (*Lonicera* L.) taxa were evaluated in North Dakota, Manitoba and/or reviewed in the literature for relative honeysuckle aphid [*Hyadaphis tataricae* (Aizenberg)] susceptibility, winter hardiness and landscape characteristics. Sixty taxa are rated susceptible to highly susceptible, 13 lightly susceptible and 55 with apparent resistance to aphid attack. *Lonicera tatarica* L., *L. morrowii* Gray. and *L. ruprechtiana* Reg., including cultivars and hybrids derived from these species, were particularly susceptible. Taxa with apparent aphid resistance were evaluated for hardiness zone assignment and landscape qualities. Only 3 taxa are rated in the high recommendation category for landscape planting in USDA hardiness zones 2 through 5. These include *L. x brownii* (Reg.) Carr. 'Dropmore Scarlet', *L. x xylosteoides* Tausch. 'Miniglobe' and *L. xylosteum* L. 'Emerald Mound'. Sixteen taxa received an average recommendation and 27 taxa a low recommendation. The 60 taxa which proved susceptible or highly susceptible to honeysuckle aphid, plus 17 additional taxa, are placed in the non-recommendation category. These 77 taxa represent 57% of the taxa evaluated in this study. Eleven taxa are recommended for potential use in shelterbelt or conservation plantings as replacements for aphid susceptible honeysuckles.

Index words: honeysuckle (*Lonicera* L.), honeysuckle aphid [*Hyadaphis tataricae* (Aizenberg)], susceptibility, resistance, winter hardiness, landscape/shelterbelt recommendations.

Significance to the Nursery Industry

Among woody plant genera, the genus *Lonicera* is often considered inferior for use in the landscape. Many honeysuckles are characterized by dull foliage, leggy growth habits and poor winter appearance. Yet, this genus has provided a serviceable group of shrubs that are winter hardy and adaptable to the stressful climatic conditions experienced in USDA Hardiness Zones 2 through 5. Although numerous honeysuckle taxa are very susceptible to the honeysuckle aphid, a significant pool of resistant germplasm exists. Hopefully, as breeding and selection programs progress, the inventory of aphid resistant, landscape useful honeysuckles will expand.

Introduction

The genus *Lonicera* is a member of Caprifoliaceae, the honeysuckle family. Over 150 species of honeysuckles, including a large number of cultivars, have been grown in America (1). Several taxa, including *L. tatarica* and cultivar 'Zabellii', *L. xylosteum* 'Emerald Mound' and *L. x xylosteoides* 'Clavey's Dwarf', were popular in the Midwest and Northern Plains because of their winter hardiness, adaptation to varied soil and moisture conditions, ease of propagation, and flowering and fruiting characteristics. Although several compact cultivars have been introduced, most cultivated species are medium to large shrubs. Several species have vine-like characteristics.

Honeysuckle aphid [*Hyadaphis tataricae* (Aizenberg)] was first reported and described in 1936 in Russia after which it was frequently mentioned in Europe (7). This aphid is native

to northern and western Asia according to Voegtlin (21, 22). The aphid first entered North America in Quebec in the mid-1970s on infested plants from Europe (2). The earliest observation in the United States was in northeastern Illinois (Lake County) in 1979 (22). Since then, this aphid has spread throughout North America. Grigorov (7) gave a detailed account of the insect's biology in 1965. Severe witches' brooming is the most prominent effect. Broom-deformed twigs result in serious aesthetic impairment to shrubs in the landscape and, quite often, mortality. Newly planted seedlings or young vigorously growing plants with highly succulent tissues are particularly vulnerable. Over the past 15 years, numerous honeysuckles, particularly *L. tatarica* (Tatarian honeysuckle) and its cultivars, have been destroyed as honeysuckle aphid became epidemic in North America.

The objectives of this study were to assess honeysuckle taxa for susceptibility to honeysuckle aphid attack; evaluate honeysuckle taxa with apparent honeysuckle aphid resistance for winter hardiness and landscape characteristics; and provide alternative recommendations for the commonly planted *L. tatarica* (Tatarian honeysuckle) for use in landscape and conservation plantings in USDA Hardiness Zones 2 through 5.

Materials and Methods

One-hundred-and-eight honeysuckle accessions were evaluated in the North Dakota State University (NDSU) Research Arboretum, Absaraka, ND, and 108 accessions at the Morden Arboretum, Agriculture Canada Research Station, Morden, Manitoba, Canada (MRS). Susceptibility to honeysuckle aphid was evaluated for three years (1985–87 NDSU and 1986–89 MRS).

The NDSU and MRS evaluations were correlated with the findings in the literature by assigning four rating criteria as follows: highly susceptible—marked leaf and stem distortion, including numerous witches' brooms (rating = 1.0); susceptible—leaf and stem distortion visible, including scattered witches' brooms (rating = 2.0); lightly susceptible—slight distortion of leaves or stems visible but devoid of

¹Received for publication March 6, 1992; in revised form July 1, 1997.

Journal Paper No. 1993 of the North Dakota State University, Agricultural Experiment Station and Agriculture Canada, Morden Experiment Station.

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witches' brooms (rating = 3.0); and apparent resistance—no visible distortion of leaves or stems (rating = 4.0).

Eighty honeysuckle accessions were reviewed in the literature to obtain aphid susceptibility ratings. Literature re-

viewed includes Boisvert *et al.* (2), Cummings (3), Dirr (4), Evers (5), Funk (6), Lewis (10), Mainquist *et al.* (11), Nielson (12), Nixon (13), Pellett *et al.* (14, 15, 16), Selinger (18), Sydnor (19) and Voegtlin (22). Based on these reports and

Table 1. Sixty *Lonicera* (honeysuckle) taxa rated as susceptible or highly susceptible to honeysuckle aphid in NDSU/MRS evaluations and/or review of the literature.

Scientific name	Common name	Number of NDSU/MRS		Literature citations
		Accessions	Plants	
<i>L. x amoena</i> Zab. (<i>L. korolkowii</i> x <i>L. tatarica</i>)	Gotha H.	2	4	3, 6, 10
<i>L. x bella</i> Zab. (<i>L. morrowii</i> x <i>L. tatarica</i>)	Belle H.	—	—	2, 3, 6, 10, 11, 16, 22
<i>L. x bella</i> 'Albida'	White Belle H.	2	5	5, 11, 16
<i>L. x bella</i> 'Atrorosea'	Pink Belle H.	—	—	11, 16
<i>L. x bella</i> 'Candida'	Candida Belle H.	—	—	10
<i>L. x bella</i> 'Dropmore'	Dropmore Belle H.	3	6	2, 5, 16
<i>L. x bella</i> 'Rosea'	Rosea Belle H.	1	2	—
<i>L. x</i> 'Bouquet'	Bouquet H.	2	6	5, 10
<i>L. conjugialis</i> Kellogg.	Purpleflower H.	1	2	3, 6, 10
<i>L. confusa</i> (Sweet.) DC. 'Multiflora'	—	1	2	—
<i>L. discolor</i> Lindl.	—	—	—	11, 16
<i>L. gynochlamydea</i> Hemsl.	—	1	2	—
<i>L. maackii</i> (Rupr.) Maxim. var. <i>podocarpa</i> Franch.	Mongolian H.	—	—	11, 16
<i>L. microphylla</i> Willd.	—	1	2	5
<i>L. x minutiflora</i> Zab. (<i>L. morrowii</i> x <i>L. x xylosteoides</i>)	Bunchberry H.	—	—	2, 3, 6, 10, 16, 22
<i>L. morrowii</i> Gray.	Morrow H.	2	4	2, 3, 6, 10, 11
<i>L. x muendeniensis</i> Rehd. (<i>L. x bella</i> x <i>L. ruprechtiana</i>)	Muenden H.	1	2	3, 6, 10, 13, 22
<i>L. x muendeniensis</i> var. <i>xanthocarpa</i>	—	—	—	2
<i>L. x muscaviensis</i> Rehd. (<i>L. morrowii</i> x <i>L. ruprechtiana</i>)	Muscovy H.	2	3	22
<i>L. x myrtilloides</i> Purpus. (perhaps <i>L. angustifolia</i> Wall. exDC. x <i>L. myrtillus</i> Hook. f. & Thoms.)	—	1	2	—
<i>L. x notha</i> Zab.	Rutarian H.	2	5	11, 13, 16
<i>L. olgae</i> Regel. & Schmalh.	Olga H.	1	3	—
<i>L. orientalis</i> Lam.	Buckthorn H.	—	—	2, 11, 16
<i>L. orientalis</i> var. <i>longifolia</i> (Dipp.) Rehd.	—	1	1	—
<i>L. rupicola</i> Hook. f. & Thoms.	—	—	—	16
<i>L. ruprechtiana</i> Reg.	Manchurian H.	2	6	3, 5, 6, 10, 16
<i>L. ruprechtiana</i> var. <i>calvescens</i> Rehd.	—	1	2	—
<i>L. tatarica</i> L.	Tatarian H.	8	22	3, 5, 7, 10, 11, 16, 22
<i>L. tatarica</i> 'Alborosea'	—	—	—	16
<i>L. tatarica</i> 'American Beauty'	American Beauty H.	1	2	—
<i>L. tatarica</i> 'Angustifolia'	Narrowleaf H.	1	2	2, 11, 12, 16
<i>L. tatarica</i> 'Beavermor'	Beavermor H.	2	4	2
<i>L. tatarica</i> 'Best Red'	Best Red H.	1	2	—
<i>L. tatarica</i> 'Bytown'	Bytown H.	1	1	—
<i>L. tatarica</i> 'Cardinal'	Cardinal H.	1	2	5
<i>L. tatarica</i> 'Carmine Glory'	Carmine Glory H.	1	2	—
<i>L. tatarica</i> 'Carleton'	Carleton H.	4	9	5
<i>L. tatarica</i> 'Cascade'	Cascade H.	1	1	—
<i>L. tatarica</i> 'Cheerio'	Cheerio H.	1	2	5
<i>L. tatarica</i> 'Frosty'	Frosty H.	1	2	—
<i>L. tatarica</i> 'George'	George H.	1	2	—
<i>L. tatarica</i> 'Grandfather Alba'	Grandfather Alba H.	1	2	—
<i>L. tatarica</i> 'Grandiflora'	Bride H.	1	2	2
<i>L. tatarica</i> 'Grandiflora Rubra'	Grandiflora Rubra H.	1	2	—
<i>L. tatarica</i> 'Hack's Red'	Hack's Red H.	2	6	10
<i>L. tatarica</i> 'Lutea'	Yellow Fruit H.	—	—	4
<i>L. tatarica</i> 'Magnared'	Magnared H.	1	2	—
<i>L. tatarica</i> 'Morden Orange'	Morden Orange H.	3	7	2, 5, 11, 16
<i>L. tatarica</i> 'Mystic Melody'	Mystic Melody H.	1	8	—
<i>L. tatarica</i> 'Nana'	Low H.	3	6	5, 10, 11, 16
<i>L. tatarica</i> 'P.G. Dwarf'	P.G. Dwarf H.	1	2	—
<i>L. tatarica</i> 'Pulcherrima'	Pulcherrima H.	1	2	—
<i>L. tatarica</i> 'Red Giant'	Red Giant H.	1	2	—
<i>L. tatarica</i> 'Rosea'	Rosy H.	1	2	2, 10, 12
<i>L. tatarica</i> 'Sheridan Red'	Sheridan Red H.	1	1	—
<i>L. tatarica</i> 'Simonet Red'	Simonet Red H.	1	2	—
<i>L. tatarica</i> 'Valencia'	Valencia H.	2	4	5
<i>L. tatarica</i> 'Virginalis'	Maiden H.	1	2	11, 16
<i>L. tatarica</i> 'Wheeling'	Wheeling H.	—	—	10, 11, 16
<i>L. tatarica</i> 'Zabelii'	Zabel's H.	6	48	2, 4, 5, 10, 11, 12, 16

(some authorities list as *L. korolkowii* var. *zabelii* Rehd.)

extensive NDSU and MRS evaluations, aphid susceptibility or resistance ratings were established for 135 honeysuckle accessions.

Honeysuckle taxa categorized with apparent honeysuckle aphid resistance were evaluated at NDSU and MRS for winter hardiness. Primary criteria utilized in evaluating hardiness were subjective ratings: 0 = dead; 5 = no injury at NDSU and 0 = dead; 10 = no injury at MRS. Winter hardiness ratings were also compared with those referenced in the literature (1, 4, 9, 17, 19, 23).

Hortus Third (1), Standardized Plant Names (8) and additional references (4, 9, 17, 23) were used to corroborate nomenclature. Common names, however, are lacking for a considerable number of honeysuckle taxa in the literature. The authority for the scientific name is listed the first time each taxon appears in the text or in tables 1 through 4.

Honeysuckle taxa with apparent resistance to honeysuckle aphid injury were categorized into 4 recommendation categories: high recommendation, average recommendation, low recommendation, and non-recommendation. Landscape qualities were an important factor in categorization, including foliage quality, growth habit, flowering and fruiting, leginess and other factors. Data on winter hardiness and landscape characteristics were collected for up to 20 years.

Results and Discussion

Sixty honeysuckle taxa are rated as susceptible or highly susceptible to the honeysuckle aphid. These are listed alphabetically by scientific name in Table 1. Plants in these two categories are combined and listed in the same table, since both levels of susceptibility preclude recommendation of these taxa for planting. Common names are included in all tables if cited in the literature. *Lonicera tatarica*, *L. morrowii*, *L. ruprechtiana*, and hybrids between these species, are susceptible to honeysuckle aphid. This is also true for most cultivars derived from these species. Thirteen additional accessions are also susceptible. Based on three reports in the literature, *L. maackii* (Rupr.) Maxim var. *podocarpa* Franch. is susceptible. However, other accessions of this species exhibited resistance, which is not readily explainable.

Table 2 lists 13 honeysuckle taxa which are lightly susceptible to aphid attack. Most of these taxa are not commonly planted. *Lonicera fragrantissima* Lindl. and Paxt. (winter honeysuckle) has been used to a limited extent in hardiness

zone 5. Three *Lonicera tatarica* cultivars, including 'Best Pink', 'Latifolia' and 'Sibirica' were damaged only lightly, lacking visible broom formation.

Fifty-five honeysuckle taxa which displayed apparent resistance to honeysuckle aphid injury are listed in Table 3. *Lonicera alpigena* L., *L. caerulea* L., *L. chrysantha* Turcz., *L. ferдинандii* Franch. and *L. xylosteum* are examples of species showing resistance. These and several other species in Table 3 are not commonly grown. *Lonicera* 'Freedom' and *L. x xylosteoides* cultivars displayed good resistance in this study. Occasional shoots on *L. xylosteum* 'Emerald Mound' were found with a temporary tinge of leaf or stem distortion. Since symptoms did not persist as the growth matured, this cultivar was not rated in the slightly susceptible category. It is noteworthy that all of the vine honeysuckle taxa displayed resistance. In addition, the apparent resistance of *L. tatarica* 'Arnold Red' is significant. Based on this study, 'Arnold Red' is the only Tatarian honeysuckle cultivar recommended for general planting since the honeysuckle aphid epidemic became serious in North America. 'Arnold Red', and possibly 'Best Pink', 'Latifolia' and 'Sibirica' could serve as aphid resistant germplasm for future breeding work. After this study was completed, the University of Minnesota introduced an aphid resistant cultivar named *L. x 'Honey Rose'*, a cross between *L. tatarica* 'Arnold Red' and *L. tatarica* 'Zabelii' (14). Based upon this information and three years' evaluation at NDSU, this cultivar is included in Table 3.

Table 4 lists seven taxa which are not categorized in this study due to insufficient or conflicting data concerning aphid attack. *L. korolkowii* accessions showed susceptibility at MRS, but resistance at NDSU. Several accessions in Table 4 could have been putative hybrids or plants propagated sexually from seed. Such progeny would not be true-to-type and could account for conflicting data.

Based upon NDSU and MRS evaluations, as well as information from the literature, honeysuckle taxa that are resistant to aphid attack and recommended for planting in USDA Hardiness Zones 2 through 5 are summarized in Table 5. Landscape qualities of each taxon, in addition to aphid resistance, determine the category of recommendation in which the plant appears. Hardiness zones and approximate plant heights are also included.

Only three taxa are highly recommended. Brief descriptive features of these plants are as follows:

Table 2. Thirteen *Lonicera* (honeysuckle) taxa rated as lightly susceptible to honeysuckle aphid in NDSU/MRS evaluations and/or review of the literature.

Scientific name	Common name	Number of NDSU/MRS		Literature citations
		Accessions	Plants	
<i>L. demissa</i> Rehd.	—	2	5	5
<i>L. fragrantissima</i> Lindl. & Paxt.	Winter H.	—	—	4, 20
<i>L. insularis</i> Nakai.	—	3	10	5, 16
<i>L. insularis</i> x <i>L. tatarica</i> (hybrid)	—	1	3	—
<i>L. ledebourii</i> Esch.	Ledebour H.	—	—	2
<i>L. maximowiczii</i> (Rupr.) Maxim.	Manchurian H.	—	—	2
<i>L. x salicifolia</i> Zab. (<i>L. ruprechtiana</i> x <i>L. x xylosteoides</i>)	Willowleaf H.	1	2	2
<i>L. tatarica</i> L. 'Best Pink'	Best Pink H.	1	2	—
<i>L. tatarica</i> 'Latifolia'	Great H.	1	2	—
<i>L. tatarica</i> 'Sibirica' (syn. 'Rubra')	Red H.	3	5	2, 10, 16
<i>L. tatarinovii</i> Maxim.	—	—	—	2, 16
<i>L. trichosantha</i> Bur. & Franch.	Slender H.	1	2	—
<i>L. x xylosteoides</i> Tausch. (<i>L. tatarica</i> x <i>L. xylosteum</i>)	Vienna H.	1	2	13

Table 3. Fifty-five *Lonicera* (honeysuckle) taxa rated with apparent resistance to honeysuckle aphid in NDSU/MRS evaluations and/or review of the literature.

Scientific name	Common name	Number of NDSU/MRS		Literature citations
		Accessions	Plants	
<i>L. alpigena</i> L.	Alps H.	1	3	—
<i>L. alpigena</i> 'Nana'	Dwarf Alps H.	1	4	10, 11, 16
<i>L. x brownii</i> (Reg.) Carr. 'Dropmore Scarlet' (<i>L. hirsuta</i> Eat. x <i>L. sempervirens</i>)	Dropmore Scarlet H.	5	10	4, 10
<i>L. caerulea</i> L.	Sweetberry H.	2	5	2, 5, 11, 16
<i>L. caerulea</i> var. <i>altaica</i> Pall.	Altai H.	1	3	—
<i>L. caerulea</i> var. <i>dependens</i> (Dipp.) Rehd.	—	1	3	—
<i>L. caerulea</i> (NC-7 compact selections)	—	2	12	5
<i>L. caerulea</i> var. <i>edulis</i> Reg.	Turkestan H.	15	22	2, 11, 16
<i>L. caerulea</i> var. <i>edulis</i> 'George Bugnet'	George Bugnet H.	1	2	—
<i>L. caerulea</i> var. <i>edulis</i> 'Julia Bugnet'	Julia Bugnet H.	1	2	—
<i>L. caerulea</i> 'Kanzu'	Kanzu H.	1	3	—
<i>L. caerulea</i> 'Viridifolia'	—	—	—	2
<i>L. chrysantha</i> Turcz.	Coralline H.	2	6	2, 5, 16
<i>L. chrysantha</i> var. <i>latifolia</i> Korsh.	Turkestan Coralline H.	—	—	11
<i>L. chrysantha</i> var. <i>longipes</i> Maxim.	—	1	2	—
<i>L. chrysantha</i> var. <i>villosa</i> Rehd.	Villous Coralline H.	2	5	—
<i>L. dioica</i> L.	Limber H.	2	3	4
<i>L. ferdinandii</i> Franch.	Ferdinand H.	1	5	11, 16
<i>L. 'Freedom'</i> (appears to be a <i>L. korolkowii</i> selection, but original accession obtained at University of Minnesota was labelled <i>L. x amoena</i> 'Arnoldiana')	Freedom H.	1	6	4, 15
<i>L. glaucescens</i>	Douglas H.	4	6	—
<i>L. x heckrottii</i> Rehb. (<i>L. x americana</i> (Mill.) K. Koch. x <i>L. sempervirens</i>)	Everblooming H.	2	4	4, 10
<i>L. x heckrottii</i> 'Gold Flame'	Gold Flame H.	2	3	4
<i>L. x heckrottii</i> 'Summer King'	Summer King H.	—	—	4, 10
<i>L. heteroloba</i> Batal.	—	1	1	—
<i>L. x 'Honey Rose'</i>	Honey Rose H.	1	3	14
<i>L. involucrata</i> (Richards.)	Twinberry H.	4	8	—
<i>L. japonica</i> Thunb. 'Aureo-reticulata'	Yellownet Japanese H.	1	2	4, 5
<i>L. japonica</i> 'Halliana'	Hall's Japanese H.	1	2	4, 10
<i>L. japonica</i> 'Purpurea'	Purple Japanese H.	1	2	4, 10
<i>L. koehneana</i> Rehd.	Koehne H.	1	2	—
<i>L. korolkowii</i> Stapf. 'Floribunda'	Broad Blueleaf H.	1	3	2, 5, 12, 16
<i>L. maackii</i> (Rupr.) Maxim	Amur H.	7	12	2, 5, 6, 10
<i>L. maackii</i> 'Cling Red'	Cling Red H.	1	6	—
<i>L. maackii</i> 'Mandan Early'	Mandan Early H.	1	2	—
<i>L. maackii</i> 'Rem Red'	Rem Red H.	1	6	—
<i>L. maximowiczii</i> (Rupr.) Maxim. var. <i>sachalinensis</i> F. Schmidt.	Sakhalin H.	4	7	5, 11, 16
<i>L. nigra</i> L.	—	1	1	—
<i>L. prolifera</i> (Kirchn.) Rehd.	Grape H.	2	3	4, 10
<i>L. sempervirens</i> L.	Trumpet H.	1	2	4
<i>L. sempervirens</i> 'Magnifica'	Magnifica Trumpet H.	1	2	4
<i>L. spinosa</i> (Decne.) Walp.	Thorn H.	1	4	—
<i>L. spinosa</i> var. <i>alberti</i> (Reg.) Rehd. (a few European authorities list as <i>L. alberti</i> Reg. (Albert H.))	Albert Thornless H.	1	4	—
<i>L. stenantha</i> Pojark.	—	1	2	—
<i>L. syringantha</i> Maxim.	Lilac H.	2	4	2, 11, 16
<i>L. syringantha</i> 'Grandiflora'	Grandiflora H.	—	—	2
<i>L. syringantha</i> var. <i>wolfii</i> Rehd.	Wolfs Lilac H.	1	1	—
<i>L. tatarica</i> L. 'Arnold Red'	Arnold Red H.	3	6	2, 4, 10, 11, 13, 16
<i>L. x tellmanniana</i> Magyar. (<i>L. sempervirens</i> x <i>L. tragophylla</i> Hemsl.)	Tellmann H.	2	4	—
<i>L. tianshanica</i> Pojark.	—	1	1	—
<i>L. vesicaria</i> Komar.	—	2	4	11, 16
<i>L. x xylostoides</i> Taush. 'Clavey's Dwarf' (see parentage, Table 2; a few authorities list as <i>L. xylosteum</i> 'Clavey's Dwarf')	Clavey's Dwarf H.	4	15	5, 10, 11, 16
<i>L. x xylostoides</i> 'Hedge King' (a few authorities list as <i>L. xylosteum</i> 'Hedge King')	Hedge King H.	4	8	5, 11, 16
<i>L. x xylostoides</i> 'Miniglobe'	Miniglobe H.	7	97	18
<i>L. x xylosteum</i> L.	European Fly H.	5	10	2, 5, 11, 16
<i>L. xylosteum</i> 'Emerald Mound' (syn. 'Nana')	Emerald Mound H.	4	15	5, 10, 11, 16

Table 4. Seven *Lonicera* (honeysuckle) taxa which were not rated for honeysuckle aphid susceptibility or resistance due to insufficient and/or conflicting data.²

Scientific name	Common name	Number of NDSU/MRS		Literature citations
		Accessions	Plants	
<i>L. x amoena</i> Zab. 'Alba'	White Gotha H.	—	—	13
<i>L. x amoena</i> 'Arnoldiana'	Arnoldiana Gotha H.	1	2	10, 11
<i>L. korolkowii</i> Stapf.	Blueleaf H.	5	10	5
<i>L. obovata</i> Royle.	—	1	3	—
<i>L. praeflorens</i> Batal.	—	1	2	—
<i>L. tatarica</i> L. 'Alba'	White H.	—	—	10
<i>L. tatarica</i> 'Des Moines'	Des Moines H.	—	—	10

²Several of these *Lonicera* accessions may have been putative hybrids and/or seedling propagules which could account for the conflicting data obtained.

***Lonicera x brownii* 'Dropmore Scarlet' (Dropmore Scarlet H).** A hybrid vine introduced by the late F. L. Skinner, Dropmore, Manitoba with significantly greater winter hardiness compared to other commonly grown vine honeysuckles. It is essentially sterile and produces showy orange-rose tubular flowers from June to November. Flowers are apricot-gold on the inside.

***Lonicera x xylosteoides* 'Miniglobe' (Miniglobe H).** An introduction from the Morden Research Station, Morden, Manitoba (1981) which is superior to the closely related

'Clavey's Dwarf' and 'Hedge King' in form, compactness and foliage color. It has a distinct winter hardiness advantage over *L. xylosteum* 'Emerald Mound' in northern zones 2b, 3, and at least part of 4a. It produces cream-colored flowers and deep red berries, both somewhat inconspicuous.

***Lonicera xylosteum* 'Emerald Mound' (Emerald Mound H).** An excellent, compact, mound-like honeysuckle with emerald-green leaves, dull creamy-yellow flowers and deep red, non-showy berries. It is not sufficiently winter hardy in northern zones, and suffers periodic winter injury in zone

Table 5. *Lonicera* (honeysuckle) taxa with apparent resistance to honeysuckle aphid categorized by recommendation for landscape planting in USDA Hardiness Zones 2 through 5.

<i>Lonicera</i> taxa	Hardiness zone recommendation	Shrub height (ft.) or vine (v)
High Recommendation		
<i>L. x brownii</i> 'Dropmore Scarlet' (Dropmore Scarlet H.)	2b,3,4,5	v
<i>L. x xylosteoides</i> 'Miniglobe' (Miniglobe H.)	2b,3,4,5	3-4
<i>L. xylosteum</i> 'Emerald Mound' (Emerald Mound H.)	4b,5	3-5
Average Recommendation		
<i>L. alpigena</i> 'Nana' (Dwarf Alps H.)	4b, 5	3-4
<i>L. dioica</i> (Limber H.)	2,3,4,5	v (shrubby)
<i>L. x heckrottii</i> (Everblooming H., including 'Gold Flame' and 'Summer King')	4b,5	v
<i>L. x</i> 'Honey Rose' (Honey Rose H.)	3,4,5	6-8
<i>L. maackii</i> (Amur H.)	3,4,5	9-12
<i>L. maackii</i> 'Cling Red' (Cling Red H.)	4b, 5	9-12
<i>L. maackii</i> 'Mandan Early' (Mandan Early H.)	3,4,5	9-12
<i>L. maackii</i> 'Rem Red' (Rem Red H.)	4b, 5	9-12
<i>L. maximowiczii</i> var. <i>sachalinensis</i> (Sakhalin H.)	3,4,5	6-9
<i>L. sempervirens</i> (Trumpet H., including 'Magnifica')	4,5	v
<i>L. tatarica</i> 'Arnold Red' (Arnold Red H.)	2,3,4,5	10-12
<i>L. x tellmanniana</i> (Tellmann H.)	4,5	v
<i>L. x xylosteoides</i> 'Clavey's Dwarf' (Clavey's Dwarf H.)	2b,3,4,5	6-7
Low Recommendation		
<i>L. caerulea</i> (Sweetberry H. and its vars. & cvs.)	2,3,4,5	5-6
<i>L. ferдинандii</i> (Ferdinand H.)	4b, 5	8-9
<i>L. fragrantissima</i> (Winter H.)	5	6-8
<i>L.</i> 'Freedom' (Freedom H.)	4,5	8-9
<i>L. glaucescens</i> (Douglas H.)	2,3,4,5	v (shrubby)
<i>L. insularis</i>	3b,4,5	8-9
<i>L. involucrata</i> (Twinberry H.)	3,4,5	8-9
<i>L. japonica</i> (Japanese H., including 'Aureo-reticulata', 'Halliana' and 'Purpurea')	5	v
<i>L. korolkowii</i> 'Floribunda' (Broad Blueleaf H.)	3b,4,5	6-7
<i>L. maximowiczii</i> (Manchurian H.)	3b,4,5	6-9
<i>L. nigra</i>	3,4,5	5-6
<i>L. spinosa</i> (Thorn H., including var. <i>alberti</i>)	3b,4,5	2-3
<i>L. syringantha</i> (Lilac H., including 'Grandiflora' and var. <i>wolfii</i>)	4,5	5-6
<i>L. x xylosteoides</i> 'Hedge King' (Hedge King H.)	3,4,5	5-6
<i>L. xylosteum</i> (European Fly H.)	3,4,5	8-9

Table 6. Seventy-six *Lonicera* (honeysuckle) taxa categorized as non-recommended for landscape planting due to aphid susceptibility and/or other unsatisfactory characteristics.

All 60 *Lonicera* taxa in Table 1, which proved susceptible or highly susceptible to honeysuckle aphid, plus the following additional taxa:

<i>L. alpigena</i> (Alps H.)
<i>L. chrysantha</i> (Coralline H. and vars. <i>latifolia</i> , <i>longipes</i> and <i>villosa</i>)
<i>L. demissa</i>
<i>L. heteroloba</i>
<i>L. koehneana</i> (Koehne H.)
<i>L. ledebourii</i> (Ledebour H.)
<i>L. obovata</i>
<i>L. prolifera</i> (Grape H.)
<i>L. x salicifolia</i> (Willowleaf H.)
<i>L. stenantha</i>
<i>L. tatarinovii</i>
<i>L. tianshanica</i>
<i>L. trichosantha</i> (Slender H.)
<i>L. vesicaria</i>

4a. It is apparently identical to 'Compacta', originally named in Poland in 1931 (9). The cultivar 'Nana' is also a synonym in the United States.

Sixteen honeysuckle taxa are included in the average recommendation category. The primary reason for not placing 'Arnold Red', 'Honey Rose', and 'Clavey's Dwarf' honeysuckles in the high recommendation category is a general deficiency in foliage quality. 'Arnold Red' also becomes quite tall and leggy in growth habit, and the dark fruits and creamy flowers of 'Clavey's Dwarf' are not very showy.

Honeysuckles listed in the low recommendation category are usable but generally inferior in several landscape qualities.

Seventy-six taxa or 57% of the honeysuckle taxa in this study are listed in the non-recommended category due to aphid susceptibility and/or unsatisfactory landscape qualities (Table 6). Most of the honeysuckle taxa from Table 4 were not categorized in Tables 5 and 6 due to insufficient information or conflicting data. However, they could undoubtedly be relegated to the non-recommended category (Table 6).

Table 7 includes eleven honeysuckle taxa which are recommended for potential use in shelterbelt, farmstead windbreak, reclamation and wildlife plantings. All of these are medium-tall to tall in size which may make them more useful for shelter and conservation purposes.

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Table 7. Eleven *Lonicera* (honeysuckle) taxa recommended for propagation and potential use in shelterbelt or conservation plantings as replacements for aphid susceptible plants.

<i>Lonicera</i> taxa	Hardiness zone recommendation
<i>L. caerulea</i> var. <i>edulis</i> (Sweetberry H.) ^z (could also use other varieties of this species)	2,3,4,5
<i>L. 'Freedom'</i> (Freedom H.) ^y	4,5
<i>L. x 'Honey Rose'</i> (Honey Rose H.) ^y	3,4,5
<i>L. korolkowii</i> 'Floribunda' (Broad Blueleaf H.) ^y	3b,4,5
<i>L. maackii</i> (Amur H.) ^y and 'Mandan Early' (Mandan Early H.) ^y	3,4,5
<i>L. maackii</i> 'Cling Red' and 'Rem Red' (Cling Red and Rem Red H.) ^y	4b,5
<i>L. maximowiczii</i> var. <i>sachalinensis</i> (Sakhalin H.) ^z	3,4,5
<i>L. tatarica</i> 'Arnold Red' (Arnold Red H.) ^y	2,3,4,5
<i>L. xylosteum</i> (European Fly H.) ^z	3b,4,5

^zSince honeysuckle species hybridize freely, there is risk in obtaining true-to-type honeysuckles if seed is collected from plants growing in close proximity to other species or hybrids.

^yIn order to maintain these cultivars as true clones with apparent resistance to honeysuckle aphid, they must be vegetatively propagated by cuttings, not sexually by seed.

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