

# OBSERVATIONS ON THE SUSCEPTIBILITY AND DEGREE OF INJURY TO CRABAPPLES FROM APPLE SCAB

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**ABSTRACT.** — In 1966, 1967, and 1968 the crabapple collection at the Morton Arboretum was surveyed for the occurrence of apple scab. Thirty-one taxa were found free of infection during this period.

A number of other reports have been made on the susceptibility of ornamental crabapples, *Malus* sp., to apple scab, *Venturia inaequalis* (Cke.) Wint. Most of them have been based on field surveys in the eastern and east central United States (Chadwick, L. C., 1965; Nichols, L. P., 1963; Nichols, L. P., 1965; and Nichols, L. P., 1967) or on the effects of greenhouse inoculations (Shay, J. R., 1961; and Shay, J. R. and L. F. Hough, 1952). This present survey was undertaken to observe the effects of apple scab under field conditions occurring in northeastern Illinois in 1966, 1967, and 1968.

A survey of crabapples growing at the Morton Arboretum, Lisle, Illinois was made in August of each of the three years to observe the occurrence and severity of apple scab. About 250 species, varieties, and cultivars were examined, most of which were represented by at least three specimens.

The results of this survey are listed in Table 1. The degree of injury was rated from 0 to 3, with 0 indicating no lesions or spots on the leaves and the plant apparently free from apple scab; 1, lesions or spots present on less than one-half of the foliage; 2, lesions or spots present on more than one-half of the foliage with slight defoliation; 3, lesions or spots on most of the foliage accompanied by severe defoliation.

Whenever cedar-apple rust, *Gymnosporangium juniperi-virginianae* Sew., powdery mildew, *Podosphaera* sp., or fire flight *Erwinia amylovora* (Burr.) Winslow, *et al.*, were observed, they were noted in the survey as "other diseases." No attempt was made to rate the severity of these infections.

Observations of other authors have also been incorporated in Table 1. The differences in the data reported here, from what other workers have observed, are possibly due to different strains of the causal organism (Bagga, H. S. and D. M. Boone, 1968), variation in climatic conditions, or incorrect identification of plant material.

KIND <sup>a</sup>	Scab			Other Disease Observed <sup>b</sup>	Other Authors <sup>c</sup>
	66	67	68		
Abundance*	..	0	0		Ra
x <i>adstringens</i> ..	2	1	2		Sa, d
ALEXIS..	1	1	1		Sa
ALMEY..	3	1	2		Sb, d, e
AMISK..	1	2	1		Ra, Se
AMUR..	1	0	2		
<i>angustifolia</i> ..	0	0	0	CA	
Anoka*	..	1	..		
ARCTIC DAWN..	0	0	0		Ra
x <i>arnoldiana</i> ..	2	1	2		Re, Sb, d
ARROW..	3	1	1		Sa, d
x <i>astracanica</i> ..	1	0	0		Ra
x <i>atrosanguinea</i> ..	0	0	1		Rd, e, Sc
Babine*	1	1	1		
<i>baccata</i> ..	1	0	2		Sc, d
b. <i>aurantiaca</i> *	1	1	1		
b. <i>cerasifera</i> *	..	..	2		
b. <i>cerasiformis</i> *	0	0	1		
b. <i>columnaris</i> ..	1	1	1		Rd, Sc, e
b. <i>fructo-flava</i> *	1	1	1		
b. <i>gracilis</i> ..	0	0	0		Sc
b. <i>himalaica</i> ..	0	0	0		Ra
b. <i>jackii</i> ..	0	0	0		Rc, d, e
b. <i>lasiostyla</i> *	0	0	..		
b. <i>lutea</i> *	..	0	0		
b. <i>oblonga</i> *	1	0	0		
b. <i>odorata</i> *	2	3	2		
b. 'scab immune'	0	0	0		
b. 'source'	1	0	1		
b. <i>stricta</i> *	1	1	..		
b. 'Unusual'	..	..	1		
BASKATONG..	1	1	1		Ra
BEAUTY..	1	1	1		Rc
BEDFORD..	0	0	1	PM	
Beverly*	0	1	0		
BOB WHITE..	0	0	1		Rc, d, e
<i>bracteata</i> ..	2	1	1		
<i>brevipes</i> ..	1	1	1		Sc, d
BRIER..	1	2	2		
CASHMERE..	..	0	1		Sa
CATHAY..	..	0	0		Ra
CHEAL'S CRIMSON..	1	0	1		Ra, Sd
CHILKO..	1	1	1		Ra
COLUMBIA..	1	1	1		Sa
<i>coronaria</i> ..	1	1	1	CA	Sa, d
<i>c. charlottae</i> ..	..	..	2	CA	Ra, Sd, e
<i>c. dasycalyx</i> ..	1	1	1	CA	Ra
<i>c. nuevolandiana</i> ..	1	1	2	CA	Vd, Sc
<i>c. spinsa</i> *	2	1	1	CA	
COWICHAN..	2	1	1		Sa, d
CRIMSON BRILLIANT..	2	2	3		Vd, Sb, e
DARTMOUTH..	2	1	2		Ra
David*	0	0	1		Rc
x <i>dawsoniana</i> ..	0	1	1	PM	Sb
DELITE..	1	0	..		

KIND <sup>a</sup>	Scab			Other Disease Observed <sup>b</sup>	Other Authors <sup>c</sup>
	66	67	68		
denticulata*	1	1	1		Sa
Des Moines*	1	0	1		
DOLGO	0	0	1		Sc, e
DOROTHEA	1	1	2		Rd, e, Sc
E. H. WILSON	2	2	2		Ra
ELISE RATHKE	1	1	2		Ra, d
ELK RIVER	1	1	1	CA	Ra
ELLWANGERIANA	..	0	0		Ra
ERIE	3	0	1		Sa
EVELYN	1	1	1	FB	Rc, d, e
EXZELLENZ THIEL	..	1	1		Sa
FERRILL'S CRIMSON	2	2	3		Rb
FLAME	1	0	1		Sc, d
flexilis*	0	0	0		Ra
floribunda	1	0	1		Rd, e, Sc
FRAU LUISE DITTMANN	0	0	1		Ra
fusca	0	1	1		
Giant Wild Crab*	1	2	3	CA	
GIBB	1	1	0		Ra
glabrata	2	1	1		Ra
glaucescens	1	2	2		Rd, Sa
x gloriosa	1	0	1		Ra, d
Golden Gem*	0	0	0		
GOLDEN HORNET	0	0	0	PM	Rb
GOLDFINCH	2	2	1		Rb
GORGEOUS	1	0	0		Rc
GWENDOLYN	1	1	0		Rb
halliana	..	..	2		Ra, d, e
halliana spontanea	0	0	0		Sa
x hartwigii	..	1	1		Rb, d
HENRIETTA CROSBY	2	1	2		Sb
HENRY F. DuPONT	1	1	2		Sc, d, e
HILLIER CRAB	0	0	1		Ra, d
HOPA	3	2	2		Sb, d, e
huphensis	0	1	1		Rc, d, e
hybrid 'scab immune'	1	0	0		
hybrida*	1	0	1		
ioensis	1	1	1	CA	Sa
i. 'Clinton'	2	2	2	CA	
i. fimbriata	0	0	0	CA	Ra
i. klemii	1	1	2	CA	Ra, Vd, Se
i. plena	1	1	2	CA	Sb, d
i. plena Dwarf*	2	1	2	CA	
i. Rocky Glen*	..	1	1	CA	
IRENE	3	3	3		Sa
JAY DARLING	2	2	3		Vd, Sb
JOAN	2	2	2		Sa
Jubilee*	1	2	1		Ra
kansuensis	1	0	0		Ra
(kansuensis x toringoides)*	..	..	2		
KATHERINE	1	1	1		Rd, Sb, e
Kibeles*	1	1	1		
KINGSMERE	1	1	1		Ra
kirghisorum*	1	1	2	PM	Ra
KIT TRIO	3	2	..		Ra

KIND*	Scab			Other Disease Observed <sup>b</sup>	Other Authors*
	66	67	68		
Kohankie*	1	1	0		
KOLA	1	1	1	CA	
<i>lancifolia</i>	1	1	1		Vd, Sa
Linda*	1	1	1		
Lings*	1	1	2	CA	
LISA	1	1	1		
Liset	0	0	1		Rb, d, e
<i>x magdeburgensis</i>	1	1	0		Ra
MAKAMIK	0	0	0		Rc, d
<i>malifolia</i> *	1	1	0		
MARSHALL OYAMA	1	0	1		Rd, Sc, e
MARTHA	2	1	2		Ra
MARY POTTER	0	0	0		Rc
MATHEWS	1	1	2	CA	Ra
<i>x micromalus</i>	0	0	0		Ra, d, e
MONTREAL BEAUTY	2	1	2		Sa
Morden (19-85)*	0	0	1		
MORTON	1	1	1	CA	Ra
MRS. BAYARD THAYER	2	1	2		Ra
NANCY TOWNSEND	1	1	1		Ra
NEVILLE COPEMAN	2	1	1		
NEVIS	1	1	2		Ra
Nicoline*	1	1	1		
Northland (Minn. 1423)*	1	0	0		
NOVA	1	1	1	CA	Rb
OAKES	1	3	3		Ra, Sd
OEKONOMIERAT ECHTERMAYER	1	2	3		Sb, d
Okanagan*	1	1	1		
OPORTO	0	0	0		Ra
ORANGE	2	1	1		Ra
Orchid*	0	0	0		
ORMISTON ROY	0	0	1		Rc
<i>orthocarpa</i> *	1	0	0		
OSMAN	1	1	0		Ra
PATRICIA	1	1	1		Sb
PEACHBLOW	0	0	0		Ra
Pink Beauty*	0	0	0		Sd, e
PINK EYE	1	1	1		Ra
PIOTOSH	1	1	1		Ra
PIXIE	2	2	2		Rb
<i>platycarpa</i>	1	1	0	FB	Sa
<i>p. hoopessii</i>	1	1	2		Ra
Ponass*	1	1	2		
Prairie Rose*	1	1	2	CA	Ra, e
<i>prattii</i>	0	0	0		
Pretty Marjorie*	2	1	1		Ra
PRINCE GEORGES	0	0	0	CA	Rd, Sb, e
PROFESSOR SPRENGER	0	0	1		Rb
PROFUSION	1	0	1		Ra
<i>prunifolia</i>	0	0	0		Rb
<i>p. fastigiata</i>	1	1	1		Ra
<i>p. fructu-coccinea</i> *	1	1	2		Ra
<i>p. rinkii</i>	0	0	2	PM	Sb, d
<i>p. xanthocarpa</i> *	1	1	0		Ra
<i>pumila</i>	1	1	1		

KIND*	Scab			Other Disease Observed <sup>b</sup>	Other Authors <sup>c</sup>
	66	67	68		
<i>p. apetala</i> .....	1	1	1		Ra
<i>p. niedzwetzkyana</i> .....	1	1	1		Ra, Vd
<i>p. paradisiaca aureus</i> * .....	1	1	2	FB	
<i>p. p. ruberrima</i> * .....	1	1	2		
<i>p. pendula</i> .....	1	1	2		
<i>p. translucens</i> .....	2	1	..		Ra
PURPLE WAVE .....	1	0	2	FB	Ra, e, Vd
<i>x purpurea</i> .....	0	0	1		Ra, d
<i>x p. aldenhamensis</i> .....	2	2	1		Sb, d, e
<i>x p. eleyi</i> .....	3	2	3		Sb, d, e
<i>x p. kornicensis</i> .....	0	0	0		Ra
<i>x p. lemoinei</i> .....	1	1	1		Rd, e, Sc
QUEEN CHOICE .....	2	1	2		Ra
Radiant* .....	3	2	3		Sc
REDFLESH .....	1	2	2		Ra
REDFORD .....	1	1	1		Ra
RED JADE .....	1	0	1		Rd, Sc, e
Redman* .....	0	1	0		
RED SILVER .....	1	1	2		Rd, Sb
RED SPLENDOR .....	0	0	0		Rc
RED TIP .....	2	1	..	CA	Ra
<i>x robusta</i> .....	..	1	0		Rd, Sc
<i>x robusta erecta</i> .....	0	0	0		Sb, d
<i>x r. persicifolia</i> .....	1	0	0		Rc, d
Rockii .....	0	0	0		Ra
RONDO .....	2	2	3	CA	Ra
ROSSEAU .....	1	1	1		Rc, d
RUDOLPH .....	1	0	1		Ra, Vd
<i>sargentii</i> .....	0	0	1		Rd, e, Sc
<i>sargentii</i> (Ill.)* .....	0	0	1		
<i>s. rosea</i> .....	0	0	0	FB	Rb, d, Se
<i>x scheideckeri</i> .....	1	1	0		Rc, Vd, Sc
SCUGOG .....	0	0	1		Ra, Sd
SEAFOAM .....	..	..	2		Rc
<i>sieboldii</i> .....	1	1	2		Ra
<i>s. arborescens</i> .....	1	1	1	PM	Rc
<i>sikkimensis</i> .....	1	1	1		Ra, d
SIMCOE .....	0	0	0		Ra, Sd
SISSIPUK .....	1	1	1		Rd, Sc
SNOWBANK .....	0	0	0		Rc
<i>x soulardii</i> .....	1	0	1		Sa, d
<i>spectabilis</i> .....	1	1	0		Sa
<i>s. albi-plena</i> .....	1	1	0		Sc, d, e
<i>s. riversii</i> .....	..	0	0		Vd, Sc, e
STRATHMORE .....	2	2	2		Sb, d, e
STRIPED BEAUTY .....	1	0	1		Ra
<i>x sublobata</i> .....	1	1	2		Sa, d
<i>sylvestris</i> .....	1	1	1		Ra
<i>s. plena</i> .....	1	1	0		
TANNER'S VARIETY .....	2	1	1		
THOMAS ROLAND .....	1	1	2	FB	Sa
TIMISKAMING .....	1	0	..		Ra
TOMIKO .....	2	1	2		
<i>toringoides</i> .....	1	1	1		Rc
<i>t. macrocarpa</i> .....	1	1	2		Sb

KIND <sup>a</sup>	Scab			Other Disease Observed <sup>b</sup>	Other Authors <sup>c</sup>
	66	67	68		
TOSHPRINCE.....	1	1	0		Ra
TRAIL.....	0	1	1		
<i>transitoria</i> .....	1	..	2		Rd
VAN ESELTINE.....	1	1	1		Rd, Sc, e
Van Houttei*.....	0	0	1		
VEITCH'S SCARLET.....	1	1	1		Ra
VIRGINIA SEEDLESS.....	..	1	1		Sa
WABISKAW.....	1	1	2		Ra, Vd
WIERDAK.....	..	..	1		
Wild Red Crab*.....	..	1	1		
WILLIAM ANDERSON.....	0	1	1		Ra
WILLIAM SIM.....	..	1	1	FB	Sb
WINTERGOLD.....	0	0	0		Rc
WISLEY CRAB.....	1	1	1		Ra
WYNEMA.....	2	2	3		Ra
<i>yunnanensis veitchii</i> .....	1	1	1		Ra, d
ZITA.....	..	1	..		
<i>zumi</i> .....	1	1	1		Ra, d
<i>z. calocarpa</i> .....	0	0	0		Rc, d, e
spec 19039*.....	1	..	1		
spec AA 20*.....	1	1	1		
spec AA 33340*.....	1	1	1		
spec D1*.....	1	0	1		
spec D2*.....	0	0	0		
spec D4*.....	..	..	0		
spec L. B. 1*.....	1	0	0		
spec VC 4*.....	2	1	2		Ra
spec W 12*.....	0	0	0		

TABLE 1.—Susceptibility and degree of injury to crabapples from apple scab.

- (a) The nomenclature of the species, which are italicized, is from Rehder (1940, 1949), that of the cultivars, which are in capitals, is from Krussmann (1962) and Wyman (1955). Names followed by an asterisk (\*) represent taxa that are new, obsolete, or discarded.
- (b) Occurrence of other diseases:  
 CA—Cedar-apple rust  
 FB—Fire blight  
 PM—Powdery mildew
- (c) Reported by others as R—resistant, V—variable, or S—susceptible to apple scab.  
 a Nichols, 1963  
 b Nichols, 1965  
 c Nichols, 1967  
 d Chadwick, 1965  
 e Shay, 1961

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*Manuscript received February 20, 1969.*