Part III (chapter 6.3): Identifying ozone sensitive taxa from experimental studies - agricultural and horticultural crops

Table 1: Effects of ozone on symptom expression, growth, and yield parameters on agricultural and horticultural crops. For each species studies allowing a comparative asessment of different cultivars are listed first, followed by records including single species. Exposure systems: controlled = growth chambers with controlled environment, GH = exposure chambers within a greenhouse, EDU = exposure to ambient air and protection from ozone impacts by application of EDU, OTC = open top chamber.--- = not determined, sensitivity ranking in order of decreasing sensitivity.

species	cultivar/genotype	country	exposure	injury	growth effect	sensitivity ranking	notes	references
Aegilops tauschii	(wild genotype)	China	OTC	yes	growth reduction		donor of modern wheat	Biswas et al. (2008)
Allium ampeloprasum subsp. ampeloprasum	(not specified)	Germany	OTC	no	---			Kostka-Rick et al. (2002)
Allium cepa	Colossal	USA	OTC	yes	none			Temple et al. (1990)
	NU-MEX	USA	OTC	yes	none			
	Rio Bravo	USA	OTC	yes	yield reduction			
	Rio Hondo	USA	OTC	yes	none			
	Polo	Germany	OTC	yes	---			Kostka-Rick et al. (2002)
Arachis hypogaea	NC-V11	USA	OTC	---	growth reduction			Booker et al. (2007)
	NC-V11	USA	OTC	---	yield reduction			Burkey et al. (2007)
Avena sativa	Vital	Sweden	OTC	---	none			Pleijel et al. (1994)
Beta vulgaris	Allgreen	India	EDU	---	growth reduction			Tiwari & Agrawal (2009)
	Allgreen	India	OTC	---	yield reduction			Tiwari et al. (2010), Kumari et al. (2013)
	Patriot	Belgium	OTC	yes	yield reduction			De Temmerman et al. (2007)
Brassica campestris	Sanjukta	India	OTC	---	yield reduction	Sanjukta > Vardan		Tripathi & Agrawal (2012)
	Vardan	India	OTC	---	yield reduction			
	Kranti	India	OTC	---	yield reduction			Singh et al. (2009b)
	Rakuten	Japan	controlled	---	yield reduction			Yonekura et al. (2005)
	Wisconsin Fast Plants	UK	controlled	---	yield reduction			Black et al. (2012)
	Wisconsin Fast Plants	UK	controlled	---	none			Black et al. (2007)

species	cultivar/genotype	country	exposure	injury	growth effect	sensitivity ranking	notes	references
Brassica campestris ssp. chinensis[1]	Aijiao	UK	GH	yes	yield reduction	no diff. between cultivars (injury), minor diff. between cultivars (growth): Huangjin less sensitive		Zhao et al. (2011)
	communis Tsen & Lee	UK	GH	yes	yield reduction			
	Heiye	UK	GH	yes	yield reduction			
	Huangjin	UK	GH	yes	yield reduction			
	Huangye	UK	GH	yes	yield reduction			
Brassica juncea	foliosa Bailey	UK	GH	yes	yield reduction			Zhao et al. (2011)
	Pusa Tarak	India	OTC	---	yield reduction			Singh et al. (2013)
Brassica napus	(not specified)	UK	GH	yes	yield reduction			Zhao et al. (2011)
	Ability	Belgium	OTC	---	yield reduction			De Bock et al. (2011), De Bock et al. (2012)
	Callypso	Germany	OTC	yes	yield reduction			Adaros et al. (1991b,d)
Brassica napus ssp. oleifera		Denmark	controlled	---	not sign		4 cvs averaged	Clausen et al. (2011)
	Bienvenu	UK	controlled	none	none			Ollerenshaw et al. (1999)
	Cobra			none	none			
	Eurol			none	yield reduction			
	Lictor			none	none			
	Samurai			none	none			
Brassica oleracea	Commander	USA	OTC	---	none			Temple et al. (1990)
	Emperor			---	none			
	Green Belt			---	inc yield			
	Green Duke			---	none			
Brassica oleracea var. gongylodes	Lahn	Germany	OTC	yes	---			Kostka-Rick et al. (2002)
Brassica oleracea var. botrytis	Rudi, Freemont	Germany	OTC	no	---			Kostka-Rick et al. (2002)
Brassica rapa	Just Righ	USA	OTC	yes	growth reduction	minor or no differences between cultivars		Heagle et al. (1985)
	Purple Top White Globe			yes	growth reduction			
	Shogoin			yes	growth reduction			
	Tokyo Cross			yes	growth reduction			
Cicer arietinum	(not specified)	UK	solardomes	yes*	growth reduction*		*120 ppb	Kasana (1991)

[1] = Brassica rapa chinensis

species	cultivar/genotype	country	exposure	injury	growth effect	sensitivity ranking	notes	references
	CSG 88101	UK	controlled	---	growth reduction			Welfare et al. (2002)
	CSG 8890	UK	controlled	---	growth reduction			
Citrullus lanatus	Charlston Gray	USA	OTC	yes	---	less sensitive: Charlston Gray and Jubilee most sensitive: Sugar Baby		Decoteau et al. (1986)
	Crimson Sweet	USA	OTC	yes	---			
	Jubilee	USA	OTC	yes	---			
	Sugar Baby	USA	OTC	yes	---			
	Sugar Baby	UK	GH	yes	growth reduction	less sensitive than *Cucumis melo*		Fernandez-Bayon et al. (1993)
	De La Reina	UK	GH	yes	red root growth			
	Reina de Corazones	Spain	OTC	---	yield reduction			Calatayud et al. (2006)
	Toro	Spain	OTC	yes	yield reduction			Gimeno et al. (1999), Reinert et al. (1992)
Corchorus olitorius	(local var.)	Egypt	controlled	yes	---			Madkour & Laurence (2002)
Coriandrum sativum	(not specified)	UK	GH	yes	yield reduction			Zhao et al. (2011)
Cucumis melo	Amarillo Temprano	UK	GH	yes	none	more sensitive than *Citrillus lanatus*		Fernandez-Bayon et al. (1993)
	Verde Tendral Tardio			yes	none			
Cucurbita pepo	Ambassador	Italy	OTC	---	(yield reduction)		CF/NF	Fumagalli et al. (2001)
ssp. pepo convar. giromonti-ina	Arlesa	Germany	OTC	yes	---			Kostka-Rick et al. (2002)
	Eskandarany	Egypt	controlled	no	---			Madkour & Laurence (2002)
Daucus carota	Yukon, Puma	Germany	OTC	yes	---			Kostka-Rick et al. (2002)
	Pusa Kesar	India	EDU	---	yield reduction			Tiwari & Agrawal (2010)
Eruca sativa	(local var.)	Egypt	controlled	yes	---			Madkour & Laurence (2002)
	(not specified)	Argentina	OTC	yes	yield reduction			Menendez et al. (2010)
Fragaria x ananassa	Elsanta	Germany	controlled	---	growth reduction	no differences between cultivars		Keutgen et al. (2005)
	Korona			---	growth reduction			
	Bogota	---	---	---	growth reduction			Drogoudi & Ashmore (2002a)
	Cambridge Favorite	---	---	---	growth reduction			
	Elsanta	---	---	---	none			
	Bogota	UK	OTC	---	yield reduction			Drogoudi & Ashmore (2002b)
	Elsanta			---	none			
	Cambridge Favourite	UK	OTC	yes	growth reduction			Drogoudi & Ashmore (2000)
Glycine max	A3127	USA	free air	---	yield reduction	significant cultivar x		Betzelberger et al. (2010)

species	cultivar/genotype	country	exposure	injury	growth effect	sensitivity ranking	notes	references
	Clark			---	yield reduction	O_3 interaction Loda and Pana were more tolerant to O_3 than IA-3010		
	Dwight			---	yield reduction			
	Holt			---	yield reduction			
	HS93-4118			---	yield reduction			
	IA 3010			---	yield reduction			
	LN97-15076			---	yield reduction			
	Loda			---	yield reduction			
	NE3399			---	yield reduction			
	Pana			---	yield reduction			
	Dwight	USA	free air	---	yield reduction	no differences between cultivars the sensitivity of current soybean genotypes to O_3 is not different from early genotypes		Betzelberger et al. (2012)
	HS93-4118			---	yield reduction			
	IA 3010			---	yield reduction			
	LN97-15076			---	yield reduction			
	Loda			---	yield reduction			
	Pana			---	yield reduction			
	Pioneer 93B15			---	yield reduction			
	Bragg	India	OTC	yes	yield reduction	no differences between cultivars		Singh et al. (2009a), (2010)
	PK 472			yes	yield reduction			
	Essex	USA	OTC	---	none			Robinson & Britz (2000)
	Forrest			---	yield reduction			
	Bragg	USA	OTC	---	yield reduction	Forrest most sensitive, Bragg less sensitive		Heagle et al. (1991)
	Davis			---	yield reduction			
	Forrest			---	yield reduction			
	Ransom			---	yield reduction			
	Calland	USA	OTC	yes	yield reduction (averaged)	ensitivity ranking for injury: Cumberland > Williams >Pella > Miles > Calland = Sparks = Union =Bay > Forrest > Ware > York = Essex		Mulchi et al. (1988)
	Cumberland							
	Pella							
	Williams							
	Miles							
	Sparks							
	Union							
	Ware							
	Bay							
	Essex							

species	cultivar/genotype	country	exposure	injury	growth effect	sensitivity ranking	notes	references
	Forrest							
	York							
	93B15	USA	free air	---	yield reduction			Morgan et al. (2006)
	Casa	Italy	OTC	---	yield reduction			Jaoude et al. (2008)
	Ceresia	Italy	OTC	---	none		CF/NF	Fumagalli et al. (2001)
	Clark	USA	OTC	---	yield reduction			Mulchi et al. (1992), Mulchi et al. (1995)
	Corsoy	USA	GH	yes	growth reduction			Endress & Grunwald (1985)
	Davis	USA	OTC	---	yield reduction			Heagle et al. (1983), Unsworth et al. (1984), Heagle et al. (1991)
	Essex	USA	OTC	yes	---			Heagle et al. (1998b)
	Essex	USA	OTC	---	growth reduction			Miller et al. (1998), Booker & Fiscus (2005)
	Essex	USA	OTC	---	yield reduction			Heagle et al. (1998a), Heggestad & Lesser (1990), Fiscus et al. (1997)
	Forrest	USA	OTC		yield reduction			Heggestad & Lesser (1990)
	Hodgson	USA	OTC	---	yield reduction			Kohut et al. (1986)
	Holladay	USA	OTC	yes	yield reduction			Heagle et al. (1998a,b)
	NK 6955	USA	OTC	yes	none			Heagle et al. (1998a,b)
	Pusa 9712	India	OTC	---	yield reduction			Singh & Agrawal (2011)
	Pusa 9814	India	OTC	---	yield reduction			Singh & Agrawal (2011)
	Williams-79	USA	OTC	---	yield reduction			Heggestad & Lesser (1990)
	Thonghuang-14	China	OTC	---	yield reduction			Zhao et al. (2005)
	Young	USA	OTC	yes	yield reduction			Miller et al. (1989), Vozzo et al. (1995)
Gossypium barbadense	Alexandria 4	Egypt	controlled	no	---			Madkour & Laurence (2002)
	Giza 12			no	---			
	Giza 70			no	---			
	Pima S-6	USA	OTC	---	yield reduction			Grantz & Shrestha (2005)
Gossypium hirsutum	C1	USA	OTC	yes	yield reduction	injury ranking: SJ-2 < C1 = GC510 < SS2086		Temple (1990)
	GC510			yes	yield reduction			
	SJ-2			yes	yield reduction			
	SS2086			yes	yield reduction			
	Acala SJ-2	USA	OTC	---	red yield			Temple et al. (1983)

species	cultivar/genotype	country	exposure	injury	growth effect	sensitivity ranking	notes	references
	Allegria	Greece	controlled	---	yield reduction			Zouzoulas et al. (2009)
	Deltapine 51	USA	OTC	yes	growth reduction			Heagle et al. (1999)
	Roma nos	Greece	controlled	---	yield reduction			Zouzoulas et al. (2009)
Hordeum vulgare	Poco	USA	OTC	no	none			Temple et al. (1985)
	CM-72			no	none			
	Alexis	Germany	OTC	---	none			Adaros et al. (1991a)
	Arena	Germany	OTC	yes	yield reduction			Adaros et al. (1991a,b)
	Barberousse	Italy	OTC	---	yield reduction		CF/NF	Fumagalli et al. (2001)
	Lina	Sweden	OTC	---	none			Pleijel et al. (1992)
	Scarlett	Germany	controlled	---	(red growth)			Plessl et al. (2005)
		Denmark	controlled	---	yield reduction		4 cvs averaged	Clausen et al. (2011)
Lactuca sativa	Dark Green	USA	OTC	yes	none			Temple et al. (1990)
	Paris Island			yes	none			Temple et al. (1990)
	Prizehead			yes	none			Temple et al. (1990)
	Royal Green			yes	none			Temple et al. (1990)
	Paris Island	UK	OTC	---	yield reduction	no diff. between cvs		Goumenaki et al. (2007)
	Salad Bowl			---	yield reduction			Goumenaki et al. (2007)
	Grenada	?	controlled	---	not sign			Goumenaki & Barnes (2009)
	Paris Island			yes	growth reduction			Goumenaki & Barnes (2009)
	Balady	Egypt	controlled	yes	---			Madkour & Laurence (2002)
	Paris Island	Egypt	controlled	yes	---			Madkour & Laurence (2002)
	Nadine	Germany	OTC	yes	---			Kostka-Rick et al. (2002)
var. crispa	Bergamo	Germany	OTC	yes	---			Kostka-Rick et al. (2002)
var. crispa	Concord	Germany	OTC	no	---			Kostka-Rick et al. (2002)
	langifolia Lam	UK	GH	yes	yield reduction			Zhao et al. (2011)
Linum usitatissimum	Padmini	India	OTC	---	yield reduction	T-397 more sensi-		Tripathi & Agrawal (2013)
	T-397			---	yield reduction	tive than Padmini		
Lycopersicon esculentum	Nikita	Spain	OTC	---	growth reduction	Nikita more senitive		Marco et al. (2008)
	Ailsa craig			---	growth reduction	than Ailsa craig		
	Ailsa Craig	Spain	OTC	yes	yield reduction	Nikita is the most		Calvo et al. (2007)
	Moneymaker			yes	yield reduction	senitive with sign.		
	Nikita			yes	yield reduction	effects in NF		
	Piedmont			yes	yield reduction	UC 82 L and Pied-		

species	cultivar/genotype	country	exposure	injury	growth effect	sensitivity ranking	notes	references
	UC 82 L			yes	yield reduction	mont are more ozone-tolerant		
	Ida	Norway	GH	---	growth reduction			Mortensen (1992)
	Paco	Italy	OTC	---	growth reduction		CF/NF	Maggio et al. (2007)
	Pusa Ruby	India	EDU	---	yield reduction			Varshney & Rout (1998)
	Pusa Ruby	India	GH	no	no		> 100 ppb	Khan & Khan (1994)
	Pusa Ruby	India	controlled	yes	growth reduction			Mina et al. (2010a)
	Tiny Tim	USA	GH	---	yield reduction			Reinert et al. (1997)
Lycopersicon pimpinellifolium	accession 1048	Italy	controlled	yes	---			Iriti et al. (2006)
Medicago sativa	Apica	Canada	OTC	---	yield reduction	Apica more sesnis-stive than Team		Renaud et al. (1997)
	Team			---	yield reduction			
	(local var.)	Egypt	controlled	yes	---			Madkour & Laurence (2002)
	Iroquois	USA	GH	---	growth reduction	no 0_3 x cultivar interaction		Cooley & Manning (1988)
	Saranac AR	USA	GH	---	growth reduction			
Nicotiana tabacum	Vam	China	OTC	---	yield reduction			Ye et al. (2012)
	Yongding			---	none			
	K63	Greece	controlled	no	none	Bel-W3 > KK 6/5 > BX 2/a > Ma 13/b = MY > K63 = 14/a (injury)		Saitanis & Karandinos (2002)
	Bel-W3			yes	growth reduction			
	BX 2/a			yes	none			
	KK 6/5			yes	growth reduction			
	KP 14/a			none	growth reduction			
	Ma 13/b			yes	(growth reduction)			
	MY			yes	none			
Oryza sativa	BR11	Japan	GH	---	yield reduction	no differences between cvs		Akhtar et al. (2010b)
	BR14			---	yield reduction			
	BR28			---	yield reduction			
	BR29			---	yield reduction			
Oryza sativa	Shanyou 63	China	free air	---	yield reduction	Yangdao 6 less sensitive than Shanyou 63		Wang et al. (2012b)
	Yangdao 6			---	yield reduction			
	Basmati-370	Pakistan	OTC	---	yield reduction	Basmati-Pak slightly less sensitive	CF/NF	Wahid et al. (2011)
	Basmati-Pak			---	yield reduction			
	IRRI-9			---	yield reduction			
	NDR 97	India	OTC	---	yield reduction			Rai et al. (2010)

species	cultivar/genotype	country	exposure	injury	growth effect	sensitivity ranking	notes	references
	Saurabh 950			---	none			
	Malviya Dhan 36	India	OTC	yes	---	no differences between cvs		Sarkar & Agrawal (2010a)
	Shivani			yes	---			
	Kirara 397	Japan	OTC	---	yield reduction	IR36>Kasalath>Kira 397>Takanari>Sup hanburi 1>IR64		Sawada & Kohno (2009)
	Akitakomachi			---	none			
	Sato-no-yuki			---	none			
	Massigura			---	none			
	Tsugaru Reman			---	none			
	Sasanishiki	Japan	OTC	---	none			
	Hitomebore	Japan	OTC	---	none			
	Koshihikari	Japan	OTC	---	none			
	Haenuki	Japan	OTC	---	none			
	Yumetsukushi	Japan	OTC	---	none			
	Yumehitachi	Japan	OTC	---	none			
	Nipponbare	Japan	OTC	---	none			
	Kasalath	Japan	OTC	---	yield reduction			
	Takanari	Japan	OTC	---	yield reduction			
	IR 36	Japan	OTC	---	yield reduction			
	IR64	Japan	OTC	---	yield reduction			
	Jothi	Japan	OTC	---	none			
	KRH-2	Japan	OTC	---	none			
	Suphanburi 1	Japan	OTC	---	yield reduction			
	Suphanburi 90	Japan	OTC	---	none			
	Liangyoupeijiu	China	free air	---	yield reduction	hybrid cultivars (SY63 and LYPJ) more sensitive than inbred cultivars (WJ15 and YD6)		Shi et al. (2009)
	Shanyou 63			---	yield reduction			
	Wujing 15			---	none			
	Yangdao 6			---	none			
	Gorkor 15	Thailand	controlled	---	yield reduction	Gorkor 15 less sensitive than Pathumthani 1		Ariyaphanphitak et al. (2005)
	Khowdokmali 105			---	none			
	Klongluang 1			---	(yield reduction)			
	Pathumthani 1			yes	yield reduction			
	MR84	?	GH	---	none	MR84 altered its		Ishii et al. (2004)

species	cultivar/genotype	country	exposure	injury	growth effect	sensitivity ranking	notes	references
	MR185	?	GH	---	yield reduction	morphology to compensate for effects on growth and yield		
	Basmati-385	UK	?	yes	growth reduction	no cv differences		Maggs & Ashmore (1998)
	IRRI-6			yes	growth reduction			
	(not specified)	China	OTC	yes	yield reduction			Jin et al. (2001)
	IR 74	USA	GH	---	yield reduction			Olszyk & Wise (1997)
	Koshihikari	Japan	controlled	yes	growth reduction			Nouchi et al. (1991)
	Koshihikari	Japan	GH	---	yield reduction			Kobayashi et al. (1995), Yamaguchi et al. (2014)
	Lemont x Qi Gui Zao	USA	OTC	---	yield reduction			Reid & Fiscus (2008)
	Nippon-bare	Japan	GH	---	yield reduction			Kobayashi et al. (1995)
	Shanyou 63	China	free air	---	yield reduction			Wang et al. (2012a)
Phaseolus vulgaris	Bush Blue Lake-254	USA	OTC	yes	yield reduction	BBL-254 and BBL-290 are more sensitive than Dwarf Horticultural and BBL-274		Heck et al. (1988)
	Bush Blue Lake-274			yes	yield reduction			
	Bush Blue Lake-290			yes	---			
	Dwarf Horticultural			yes	yield reduction			
	Bush Blue Lake 290	USA	OTC	yes	yield reduction	BBL 290 less sensitive		Eason & Reinert (1991)
	Oregon 1604			yes	yield reduction			
	Oregon 17			yes	yield reduction			
	Oregon 4907			yes	yield reduction			
	Oregon 55			yes	yield reduction			
	Oregon 58			yes	yield reduction			
	Oregon 83			yes	yield reduction			
	Oregon 91			yes	yield reduction			
	Lit	Belgium	controlled	yes	yield reduction			Vandermeiren et al. (1995)
	Stella			yes	none	Stella was the least affected		
	Groffy			yes	yield reduction			
	R123	USA	free air	---	none	tolerant		Burkey et al. (2012)
	R331			---	none	tolerant		
	S156			---	yield reduction	sensitive		
	S156	USA	OTC	yes	none		CF/NF	Elagöz & Manning (2005)
	R123			yes	yield reduction			

species	cultivar/genotype	country	exposure	injury	growth effect	sensitivity ranking	notes	references
	BBL 290			yes	yield reduction			
	BBL 274			no	yield reduction			
	S156	USA	OPEC?[2]	---	yield reduction	R331 = S156 > R123		Flowers et al (2007)
	R123			---	yield reduction			
	R331			---	yield reduction			
	Provider	USA	OTC	---	yield reduction§	sensitivity ranking: S248 > R337 > Wade > Oregon-91 >Strike >Tenderette > Provider	§ no stats loss ranged from 36% to 80%	Burkey et al. (2000)
	Tenderette	USA	OTC	---	yield reduction§			
	Strike	USA	OTC	---	yield reduction§			
	Oregon-91	USA	OTC	---	yield reduction§			
	Wade	USA	OTC	---	yield reduction§			
	R337	USA	OTC	---	yield reduction§			
	S248	USA	OTC	---	yield reduction§			
	Rintintin	Germany	OTC	---	yield reduction	Rosistiy more sensitive than Rintintin		Adaros et al. (1993)
	Rosisty			---	yield reduction			
	Groffy	?	OTC	yes	---	Groffy slightly less senitive		Salam & Soja (1995)
	Lit			yes	---			
	Stella			yes	---			
	Linden Red Kidney	USA	OTC	yes	yield reduction	'Yolano Pink'> 'Sutter Pink'>'Sal Small White'> 'Linden Red Kidney'		Temple (1991)
	SutterPink			yes	yield reduction			
	Sal Small White			yes	yield reduction			
	Yolano Pink			yes	yield reduction			
	Giza 3 Contender	Egypt	controlled	no	---			Madkour & Laurence (2002)
	Borlotto Nano Lingua di Fuoco	Italy	OTC	yes	---			Gerosa et al. (2009)
	California Dark Red	USA	controlled	yes	---			Musselman et al. (1994)
	Guangzhouyuan	China	controlled	---	yield reduction			Wang et al. (2011)
	Lingua di fuoco	Italy	OTC	---	yield reduction		CF/NF	Schenone et al. (1992), Fumagalli et al. (2001)
	Lit	Netherlands	EDU	yes	yield reduction			Tonneijck & Van Dijk (1997), (2002a)
	Lit	Italy	OTC	---	yield reduction		CF/NF	Fumagalli et al. (2001)

[2] outdoor plant environment chambers

species	cultivar/genotype	country	exposure	injury	growth effect	sensitivity ranking	notes	references
	Lit	Germany	OTC	---	growth reduction			Brunschonharti et al. (1995)
	Lit	UK	OTC	yes	---			Sanders et al. (1992a)
	Lit	France+UK	OTC	yes	growth reduction			Sanders et al. (1992c)
	Nerina	UK	OTC	---	yield reduction		increased yield at near AA	Sanders et al. (1992b)
	Nerina	France	OTC	yes	---			Kanoun et al. (2001)
	Pinto	USA	OTC	---	growth reduction			Amthor (1988)
	Pros	Netherlands	OTC	yes	yield reduction			Tonneijck & van Dijk (1998)
	Saluggia	Italy	OTC	---	yield reduction		CF/NF	Schenone et al. (1992), Fumagalli et al. (2001)
	Taylor's Horticultural	Italy	OTC	---	yield reduction		CF/NF	Schenone et al. (1992), Fumagalli et al. (2001)
	Taylor's Horticultural	Italy	OTC	---	yield reduction		CF/NF	Schenone et al. (1992)
Pisum sativum	Feltham First	UK	controlled	---	growth reduction			Bambridge et al. (1995)
Raphanus sativus	Akamaru	Japan	controlled	---	yield reduction			Yonekura et al. (2005)
	Cherry Belle	Italy	OTC	---	none		CF/NF	Fumagalli et al. (2001)
	Cherry Belle	Germany	controlled	yes	growth reduction			Barnes & Pfirrmann (1992)
	Cherry Belle	USA	OTC	yes	yield reduction			Pell et al. (1990)
	Pusa chetki	India	controlled	yes	yield reduction			Mina et al. (2009)
	Rudi	Germany	OTC	no	---			Kostka-Rick et al. (2002)
Saccharum spp		USA	GH	---	growth reduction			Grantz & Vu (2009)
Solanum tuberosum	Agria	Spain	OTC	yes	yield reduction			Asensi-Fabado et al. (2010)
	Bintje	Europe	OTC	---	(yield reduction) (increased yield)		different sites	V&ermeiren et al. (2005)
	Bintje	Europe	OTC/free air	---	growth reduction		different sites	Craigon et al. (2002)
	Bintje	Europe	OTC/free air	---	yield reduction		different sites effect <5%	Fangmeier et al. (2002)
	Bintje	UK	OTC	---	none			Lawson et al. (2001)
	Bintje	UK	OTC	---	none			Donnelly et al. (2001)
	Desiree	Spain	GH	yes	yield reduction			Calvo et al. (2009)
	Hela	Germany	controlled	---	yield reduction			Köllner & Krause (2000)
	Kufri jyoti	India	controlled	yes	yield reduction			Mina et al. (2010b)
	Norchip	USA	OTC	---	yield reduction			Pell et al. (1988)
	Norland	USA	GH	yes	---			Eckardt & Pell (1996)

species	cultivar/genotype	country	exposure	injury	growth effect	sensitivity ranking	notes	references
Spinacea oleracea	Balady	Egypt	controlled	no	---			Madkour & Laurence (2002)
	Matador, Carambole, San Marco	Germany	OTC	yes	---			Kostka-Rick et al. (2002)
Trifolium alexandrinum	Bundel	India	OTC	---	growth reduction	sesnitivity ranking: Wardan > Bundel>> JHB-146 > Saidi=Mescavi= Fahli		Chaudhary & Agrawal (2013)
	Wardan	India	OTC	---	growth reduction			
	JHB-146	India	OTC	---	growth reduction			
	Saidi	India	OTC	---	growth reduction			
	Fahli	India	OTC	---	growth reduction			
	Mescavi	India	OTC	---	growth reduction			
Trifolium repens	Ladino Sacramento	Switzerland	OTC	yes	---	L. Sacramento ≤ L. California ≪ Alban ≤ Sonja ≤ Milka-nova		Becker et al. (1989)
	Ladino California	Switzerland	OTC	yes	---			
	Alban	Switzerland	OTC	yes	---			
	Sonja	Switzerland	OTC	yes	---			
	Milkanova	Switzerland	OTC	yes	---			
Trigonella foenum-graecum	(not specified)	UK	solardomes	yes*	growth reduction*		*120 ppb	Kasana (1991)
Triticosecale wittmack	(primitive genotype)	China	OTC	yes	growth reduction		donor of mod-ern wheat	Biswas et al. (2008)
Tritcium aestivum	Yangmai 15	China?	free air?	---	none			Kou et al. (2013)
	Yangmai 16			---	yield reduction			
	Yannong 19			---	yield reduction			
	Yangfumai 2			---	none			
	Jiaxing 002			---	yield reduction			
	Amintas	?	controlled	yes	growth reduction	Gorgona most sensitive (injury) the more modern the cultivar the greater its sensitivi-ty to ozone		Barnes et al. (1990)
	Dion			yes	growth reduction			
	Generosso			yes	growth reduction			
	Gorgona			yes	growth reduction			
	Grinias			yes	growth reduction			
	Tsougrias			yes	growth reduction			
	Zoulitsa			yes	growth reduction			
	Bijoy	Japan	GH	---	yield reduction	no differences between cvs		Akhtar et al. (2010a)
	Sufi			---	yield reduction			
	Malviya 234	India	EDU	---	yield reduction	Malviya 533 less sensitive than Mal-viya 234		Tiwari et al. (2005)
	Malviya 533			---	yield reduction			

species	cultivar/genotype	country	exposure	injury	growth effect	sensitivity ranking	notes	references
	Nandu	Austria	GH	yes	---	Nandu >Perlo > Triticum durum cv. Extradur		Reichenauer et al. (1998)
	Perlo			yes	---			
	Hannong 2	China	OTC	yes	growth reduction			Biswas et al. (2008)
	Nongda 3214			yes	growth reduction			
	Xiaoyan 22			yes	growth reduction			
	Xinong 2611			yes	growth reduction			
	HUVV 510	India	OTC	---	yield reduction	'HUW 510' more sensitive in terms of vegetative growth, 'Sonalika' more sensitive in terms of reproduction		Sarkar & Agrawal (2010b)
	Sonalika			---	yield reduction			
	Yangfumai 2	China	free air	---	yield reduction	no cultivar x O_3 interaction		Zhu et al. (2011)
	Yangmai 15			---	yield reduction			
	Yangmai 16			---	yield reduction			
	Yannong 19			---	yield reduction			
	Yangfumai 2	China	free air	---	none			Kou et al. (2012)
	Yangmai 15			---	yield reduction			
	Yangmai 16			---	yield reduction			
	Yannong 19			---	none			
	Jiaxing 002				yield reduction			
	Alexandria	UK	controlled	yes	growth reduction	no differences between cvs		Barnes et al. (1995)
	Hanno			yes	growth reduction			
	Mercia			yes	growth reduction			
	Riband			yes	growth reduction			
	Haven			yes	growth reduction			
	Tsougrias	UK?	GH	yes	growth reduction	the more modern the cultivar the greater the reduc-tion in growth	old and modern Greek cultivars of wheat	Velissariou et al. (1992)
	Zoulitsa	UK?	GH	yes	growth reduction			
	Grinias	UK?	GH	yes	growth reduction			
	Amintas	UK?	GH	yes	growth reduction			
	Generosso	UK?	GH	yes	growth reduction			
	Vergina	UK?	GH	yes	growth reduction			
	Dion	UK?	GH	yes	growth reduction			
	Gorgona	UK?	GH	yes	growth reduction			

species	cultivar/genotype	country	exposure	injury	growth effect	sensitivity ranking	notes	references
	Abe	USA	OTC	yes	yield reduction			Kress et al. (1985)
	Albis	Switzerland	OTC	yes	yield reduction			Fuhrer et al. (1989), Grandjean & Fuhrer (1989), Fuhrer et al. (1992)
	Arthur-71	USA	OTC	yes	yield reduction			Kress et al. (1985)
	Coker 9835	USA	OTC	---	yield reduction			Heagle et al. (2000)
	Coker 9904	USA	OTC	---	yield reduction			Heagle et al. (2000)
	Drabant	Sweden	OTC	yes	yield reduction			Pleijel et al. (1991)
	Dragon	Sweden	OTC	---	yield reduction			Pleijel et al. (1998), Gelang et al. (2001)
	Gemini	Italy	OTC	---	yield reduction		CF/NF	Fumagalli et al. (2001)
	Hanno	UK	controlled	yes	growth reduction			Balaguer et al. (1995)
	HUW-234	India	OTC	---	yield reduction			Rai et al. (2007)
	HUW-37	India	OTC	yes	growth reduction			Mishra et al. (2013)
	K-9107	India	OTC	yes less	growth reduction			Mishra et al. (2013)
	Minaret	UK	OTC	sen	growth reduction			Mullholland et al. (1997)
	Nandu	Germany	controlled	---	yield reduction		exp. during anthesis	Meyer et al. (2000)
	Perlo	Austria	controlled	---	yield reduction			Soja & Soja (1995), Khan & Soja (2003)
	Promessa	Ireland	OTC	---	yield reduction			Finnan et al. (1996)
	Riband	UK	free air	no	yield reduction			Ollerenshaw & Lyons (1999)
	Roblin	USA	controlled*	yes*	growth reduction*		*120 ppb	Rao et al. (1995)
	Roland	USA	OTC	---	yield reduction			Kress et al. (1985)
	Satu	Finland	OTC	---	yield reduction			Ojanpera et al. (1998)
	Star	Germany	OTC	yes	yield reduction			Adaros et al. (1991a,c)
	Turbo	Germany	OTC	yes	yield reduction			Adaros et al. (1991a,c), Tiedemann et al. (1991), Bender et al. (1994), Fangmeier et al. (1994)
	Vergina	?	controlled	yes	growth reduction			Barnes et al. (1990)
	Vona	USA	OTC	sen	yield reduction			Amundson et al. (1987)
	Xiaoyan 22	China	OTC	---	yield reduction			Biswas & Jiang (2011)
		USA	OTC	---	yield reduction		averaged cvs: Massey and Saluda	Rudorff et al. (1996)

species	cultivar/genotype	country	exposure	injury	growth effect	sensitivity ranking	notes	references
		USA	OTC	---	yield reduction		8 cvs averaged	Heagle et al. (2000)
Triticum boeoticum	(wild genotype)	China	OTC	yes	growth reduction			Biswas et al. (2008)
Triticum dicoccum	(primitive genotype)	China	OTC	yes	growth reduction			Biswas et al. (2008)
Triticum durum[3]	Limnos	UK?	GH	yes	growth reduction	modern cultivars more sensitive	see *T. aestivum*	Velissariou et al. (1992)
	Electra	UK?	GH	yes	growth reduction			
	(primitive genotype)	China	OTC	yes	growth reduction	less sensitive than *T. aestivum*		Biswas et al. (2008)
	(not specified)	China	OTC	---	yield reduction			Biswas & Jiang (2011)
	Electra	?	controlled	yes	growth reduction			Barnes et al. (1990)
	Limnos	?	controlled	yes	growth reduction			Barnes et al. (1990)
	Extradur	Austria	GH	yes	---	less sensitive than *T. aestivum*		Reichenauer et al. (1998)
Triticum monococcum	(primitive genotype)	China	OTC	yes	growth reduction			Biswas et al. (2008)
Triticum timopheevii	(primitive genotype)	China	OTC	yes	growth reduction			Biswas et al. (2008)
Triticum polonicum	(primitive genotype)	China	OTC	yes	growth reduction			Biswas et al. (2008)
Valerianella locusta	Gala, Verte, de Cambrai	Germany	OTC	yes	---			Kostka-Rick et al. (2002)
Vicia faba	Romy	Egypt	controlled	no	---			Madkour & Laurence (2002)
Vigna mungo	(not specified)	UK	solardomes	yes*	growth reduction*		*122 ppb	Kasana (1991)
Vigna radiata	HUM-1	India	OTC	yes	---	HUM 1 most sensitive, HUM 23 less sensitive		Chaudhary et al. (2013)
	HUM-2			yes	---			
	HUM-23			yes	---			
	HUM-24			yes	---			
	HUM-26			yes	---			
	HUM-6			yes	---			
	Malviya Jyoti	India	EDU	---	growth reduction			Agrawal et al. (2005)
Zea mays	Ganga Safed	India	controlled	no	yield reduction			Mina (2008)
Zea mays	PAG 397	USA	OTC	---	yield reduction			Kress & Miller (1985)
Zea mays	Pioneer 3714	USA	OTC	---	yield reduction			Mulchi et al. (1995), Rudorff et al. (1996)
Zea mays	Pioneer 3780	USA	OTC	---	yield reduction			Kress & Miller (1985)

[3] =*Triticum turgidum ssp. durum*

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