Table S1. *Trichoderma*-based commercialized biocontrol agents (BCAs) against fungal phytopathogens and their application in specific plant crops.

Name of products	Species	Strain	Registered in	Protected crops	Target pathogens
Anushka	*T. viride*		India[a]	permitted for use on all crops	*Phytophthora* spp., *Rhizoctonia* spp., *Sclerotinia* spp.
BF20.001	*T. asperellum*	ICC 012	Brazil[b]	permitted for use on all crops	*Rhizoctonia solani*, *Colletotrichum* spp., *Sclerotinia sclerotiorum*
Bhoomika	*T. viride*	TNAU-TV-1	India[a]	all crops and trees	*Phytophthora* spp., *Rhizoctonia* spp., *Sclerotinia* spp.
Binab T (Binab T Wettable Powder Biorational Fungicide)	*T. polysporum* *T. viride*	ATCC 20475 ATCC 20476	USA[c]	forest trees, ornamental shade trees, ornamental trees	*Poria carbonica*, *Lentinus lepideus*
Bio Zenon	*T. harzianum*	CCT 7589	Brazil[b]	permitted for use on all crops	*Rhizoctonia solani*
Bio-Fit	*T. harzianum* *Trichoderma* spp. *T. viride*		Chile[d]	permitted for use on all crops	*Fusarium* spp., *Phytophthora* spp., *Pythium* spp., *Rhizoctonia* spp., *Verticillium* spp.
Biofort	*T. viride*		India[a]	permitted for use on all crops	*Phytophthora* spp., *Rhizoctonia* spp., *Sclerotinia* spp.
Bio-Hulk	*T. asperellum*	BV-10	Brazil[b]	permitted for use on all crops	*Rhizoctonia solani*
Bioten WP (Bio-Tam 2.0, Tenet WP, Remedier WP, Tenet T&O)	*T. asperellum* *T. gamsii*	ICC 012 ICC 080	USA[c], Canada[f], EU Members[e]	strawberry, pepper, tomato, ornamental plants, grape vine, cereal grains, cole crops, berries, cucurbits, leafy vegetables, legume vegetables, herbs, onions, citrus, greenhouse and nursery	*Pythium* spp., *Rhizoctonia* spp., *Phytophthora* spp., *Phoma* spp., *Verticillium* spp., *Fusarium* spp., *Sclerotinia* spp., *Armillaria* spp., *Rosellinia* spp., *Sclerotium rolfsii*, *Phaeomoniella chlamydospora*
Bio-Traz	*T. harzianum*		Chile[d]	permitted for use on all crops	*Botrytis cinerea*
Bora HC	*T. harzianum*	KRL-AG2	Canada[f]	greenhouse crops, greenhouse vegetables, outdoor nursery plants, agricultural field crops, strawberry, lettuce, geranium	*Pythium* spp., *Rhizoctonia* spp., *Fusarium* spp.
Bora WP	*T. harzianum*	KRL-AG2	Canada[f]	greenhouse crops, outdoor nursery plants, greenhouse transplants	*Pythium* spp., *Rhizoctonia* spp., *Fusarium* spp., *Botrytis cinerea*

Table S1. Continuation.

Name of products	Species	Strain	Registered in	Protected crops	Target pathogens
BW 240 G Biological Fungicide (Rootshield Plus Granules, Rootshield Plus Granules Biological Fungicide, Rootshield Plus+ G, Rootshield Plus+ G Biological Fungicide, Rootshield Plus+ Granules, Rootshield Plus+ Granules Biological Fungicide, Turfshield Plus G, Turfshield Plus G Biological Fungicide, Turfshield Plus Granules, Turfshield Plus Granules Biological Fungicide)	*T. virens*	G-41	USA[c]	celery, cherries, chervil, chestnut, citrus, cole crops, corn, cotton, cucumber, eggplant, endive, fennel, fruiting vegetables, garlic, grapefruit, grapes, greens, herbs, leafy vegetables, lentils, lettuce, nut trees, oak, oranges, ornamental plants, onions, parsley, peppers, plantain	*Fusarium* spp., *Phytophthora* spp., *Pythium* spp., *Rhizoctonia* spp., *Thielaviopsis* spp.
	T. afroharzianum (formerly *T. harzianum)*	T-22			
BW 240 WP Biological Fungicide (Rootshield Plus, Rootshield Plus WP Biological Fungicide, Rootshield Plus+ WP Biological Fungicide, Rootshield Plus Wettable Powder, Rootshield Plus WP, Rootshield Plus+ WP, Turfshield Plus WP, Turfshield Plus WP Biological Fungicide)	*T. virens*	G-41	USA[c], Canada[f]	berries and small fruits, bulb vegetables, cucurbit vegetables, fruiting vegetables, leafy vegetables, cereal grains, citrus fruits, asparagus, herbs and spices, hydroponic plants	*Pythium* spp., *Phytophthora* spp., *Rhizoctonia* spp., *Fusarium* spp. *Cylindrocladium* spp., *Sclerotinia* spp., *Thielaviopsis* spp.
	T. afroharzianum (formerly *T. harzianum)*	T-22			
Criyagen	*T. viride*		India[a]	permitted for use on all crops	*Botrytis cinerea*, *Fusarium* spp., *Ganoderma* spp., *Sclerotinia* spp.
Daytona	*T. harzianum*	ESALQ-1306	Brazil[b]	beans, strawberry, soybean	*Fusarium solani* f.sp. *phaseoli*, *Rhizoctonia solani*, *Sclerotinia sclerotiorum*
Derma HL	*T. harzianum*	IIHR Th-2	India[a]	permitted for use on all crops	*Alternaria* spp., *Cercospora* spp., *Fusarium* spp., *Phytophthora* spp., *Rhizoctonia* spp., *Sclerotinia* spp., *Verticillium* spp.

Table S1. Continuation.

Name of products	Species	Strain	Registered in	Protected crops	Target pathogens
Derma WHP	*T. harzianum*	IIHR Th-2	India[a]	permitted for use on all crops	*Alternaria* spp., *Cercospora* spp., *Fusarium* spp., *Phytophthora* spp., *Rhizoctonia* spp., *Sclerotinia* spp., *Verticillium* spp.
Ecohume GR	*T. viride*		India[a]	permitted for use on all crops	*Alternaria* spp., *Ascochyta* spp., *Cercospora* spp., *Fusarium* spp., *Verticillium* spp.
Ecotrich WP	*T. harzianum*	IBLF006	Brazil[b]	permitted for use on all crops	*Rhizoctonia solani*
ESQUIVE WP	*T. atroviride*	I-1237	EU Members[e]	grapevine pruning, grapevine nursery	wood decay diseases
G-41 Technical	*T. virens*	G-41	USA[c], Canada[f]	various agricultural, greenhouse and nursery crops, plants in residential settings (e.g., vegetables, fruit and ornamentals)	*Rhizoctonia* spp., *Fusarium* spp.
Gaia Bio (Biagro GEB)	*T. harzianum*	CCT 7589	Brazil[b]	permitted for use on all crops	*Rhizoctonia solani*
Hariz	*T. harzianum*	IIHR Th-2	India[a]	permitted for use on all crops	*Botrytis* spp., *Fusarium* spp., *Penicillium* spp., *Pythium* spp.
Incept	*T. hamatum*	TH382	USA[c]	compost, greenhouse soils, ornamental plants, potting soil, vegetable crops	*Botrytis* spp., *Fusarium* spp., *Phytophthora* spp., *Pythium* spp., *Rhizoctonia* spp., *Sclerotinia* spp., *Thielaviopsis* spp.
Jaivika	*T. viride*		India[a]	permitted for use on all crops	*Botrytis cinerea*, *Botrytis* spp., *Fusarium* spp., *Pythium* spp., *Rhizoctonia* spp., *Sclerotinia* spp., *Sclerotium* spp.
Monitor	*T. viride*		India[a]	permitted for use on all crops	*Alternaria* spp., *Colletotrichum* spp., *Fusarium* spp., *Phytophthora* spp., *Rhizoctonia* spp., *Sclerotium* spp., *Pythium* spp.
Natucontrol	*T. harzianum*		Brazil[b]	permitted for use on all crops	*Rhizoctonia solani*, *Sclerotinia sclerotiorum*, *Fusarium solani*

Table S1. Continuation.

Name of products	Species	Strain	Registered in	Protected crops	Target pathogens
Neemoderma	*T. viride*	TNAU-TV-1	India[a]	permitted for use on all crops	*Botrytis cinerea*, *Fusarium* spp., *Ganoderma* spp., *Pythium* spp., *Rhizoctonia* spp., *Sclerotinia* spp., *Ustilago* spp.
Niprot	*T. viride*		India[a]	permitted for use on all crops	fungal diseases
Organic WP	*T. asperellum*	URM 5911	Brazil[b]	permitted for use on all crops	*Fusarium solani* f.sp. *phaseoli*, *Rhizoctonia solani*
Pardella	*T. asperellum* *T. harzianum*	URM 8120 URM 8119	Brazil[b]	permitted for use on all crops	*Rhizoctonia solani*, *Sclerotinia sclerotiorum*, *Colletotrichum* spp.
Peak Trico	*T. viride*		India[a]	permitted for use on all crops	*Armillaria* spp., *Fusarium* spp., *Ganoderma* spp., *Pythium* spp.
Peak Trico-H	*T. viride*	IIHR Th-2	India[a]	permitted for use on all crops	*Armillaria* spp., *Fusarium* spp., *Ganoderma* spp., *Pythium* spp.
Predatox	*T. harzianum*	IBLF006	Brazil[b]	lettuce, soybean, beans	*Rhizoctonia solani*, *Sclerotinia sclerotiorum*
Quality	*T. asperellum*	URM 5911	Brazil[b]	permitted for use on all crops	*Fusarium* spp., *Rhizoctonia* spp.
Rizoderma	*T. harzianum*	IBLF006	Brazil[b]	permitted for use on all crops	*Rhizoctonia solani*, *Sclerotinia sclerotiorum*
ROM-Tricho	*T. viride*		India[a]	pepper, cardamon, ginger, turmeric, banana, cabbage, potato, pomegranate and other crops	*Fusarium* spp., *Phytophthora* spp., *Pythium* spp., *Sclerotium* spp.
ROM-Trypae mixture	*T. viride*		India[a]	banana, cardamon, pepper, turmeric, ginger, pomegranate, all types of vegetable and other crops	*Fusarium* spp., *Pythium* spp., *Phytophthora* spp.
Sentinel	*T. atroviride*	LU132	New Zealand[g], Australia[h]	grapevines, tomatoes	*Botrytis cinerea*
Sharad-Tricho	*T. viride*	IIHR-TV-5	India[a]	wide range of crops	*Phytophthora* spp., *Pythium* spp., *Rhizoctonia* spp.
Shocker	*T. harzianum*	CPQBA 040-11	Brazil[b]	beans, soybean	*Rhizoctonia solani*, *Sclerotinia sclerotiorum*

Table S1. Continuation.

Name of products	Species	Strain	Registered in	Protected crops	Target pathogens
Stimucontrol	*T. harzianum*	CCT 7589	Brazil[b]	permitted for use on all crops	*Rhizoctonia solani*, *Sclerotinia sclerotiorum*
Stimucontrol Evolution	*T. harzianum*	CCT 7589	Brazil[b]	permitted for use on all crops	*Rhizoctonia solani*, *Sclerotinia sclerotiorum*
Sustain	*T. asperellum*		Uganda[i]	permitted for use on all crops	*Fusarium* spp.
T-22 G Biological Fungicide (Rootshield Granules Biological Fungicide, T-22 G Granules Biological Fungicide)	*T. afroharzianum* (formerly *T. harzianum)*	T-22	USA[c]	agricultural field crops, fruiting vegetables, leafy vegetables, fruits, ornamental plants	*Cylindrocladium* spp., *Fusarium* spp., *Pythium* spp., *Rhizoctonia* spp., *Thielaviopsis* spp.
T-22 Technical	*T. afroharzianum* (formerly *T. harzianum)*	T-22	USA[c]	permitted for use on all crops	*Fusarium* spp., *Pythium* spp., *Rhizoctonia* spp., *Thielaviopsis* spp.
T-22 WP Biological Fungicide (Plantshield HC Biological Fungicide, Root Guardian, Rootshield AG, Rootshield AG Biological Fungicide, Rootshield Home and Garden Biological Fungicide, Rootshield Seed Treatment, Rootshield Seed Treatment Biological Fungicide, T-22 HC Biological Fungicide)	*T. afroharzianum* (formerly *T. harzianum)*	T-22	USA[c]	almonds, bananas, beans, berries, broccoli, brussels, canola, carrots, cauliflower, corn, cotton, cucumbers, ornamental plants, citrus, grapes, wheat, leafy vegetables,	*Botrytis* spp., *Fusarium* spp., *Pythium* spp., *Rhizoctonia* spp., *Thielaviopsis* spp.
T34 Biocontrol (Asperello T34 Biocontrol)	*T. asperellum*	T34	USA[c], EU Members[e]	carnation plants growing in the greenhouse	*F. oxysporum* f.sp. *dianthi*
Tanus	*T. asperellum* *T. harzianum*	URM 8120 URM 8119	Brazil[b]	permitted for use on all crops	*Rhizoctonia* spp., anthracnose disease
Trianum DS	*T. afroharzianum* (formerly *T. harzianum)*	T-22	Brazil[b]	permitted for use on all crops	*Macrophomina phaseolina*, *Sclerotinia sclerotiorum*, *Fusarium oxysporum* f.sp. *lycopersici*

Table S1. Continuation.

Name of products	Species	Strain	Registered in	Protected crops	Target pathogens
Trianum G Biological Fungicide (Trianum G, Trianum Granules Biological Fungicide, T-22 G Granules – Biological Fungicide)	*T. afroharzianum* (formerly *T. harzianum)*	T-22	USA[c]	permitted for use on all crops	*Cylindrocladium* spp., *Fusarium* spp., *Pythium* spp., *Rhizoctonia* spp., *Thielaviopsis* spp.
Trianum Technical	*T. afroharzianum* (formerly *T. harzianum)*	T-22	USA[c]	permitted for use on all crops	*Rhizoctonia solani*, *Fusarium* spp., *Pythium* spp.
Trianum WG Biological Fungicide (Trianum P Biological Fungicide)	*T. afroharzianum* (formerly *T. harzianum)*	T-22	USA[c], Brazil[b]	permitted for use on all crops	*Fusarium* spp., *Rhizoctonia* spp., *Pythium* spp., *Thielaviopsis* spp.
Trianum P	*T. atrobrunneum*	ITEM 908	EU Members[e]	tomato	*Pythium* spp., *Rhizoctonia* spp., *Fusarium* spp.
Tricho Plus Biofungicide	*T. asperelloides*	JM41R	USA[c]	greenhouse plant beds, irrigation systems	*Fusarium* spp., *Phytophthora* spp., *Pythium* spp., *Rhizoctonia* spp., *Sclerotinia* spp.
Trichoderma harzianum WP	*T. harzianum*		Chile[d]	permitted for use on all crops	*Botrytis cinerea*, *Phytophthora* spp.
Trichodermax EC	*T. asperellum*	T-211	Brazil[b]	soybean, beans	*Fusarium solani* f.sp. *glycines*, *Rhizoctonia solani*, *Sclerotinia sclerotiorum*
Trichodermil SC 1306	*T. harzianum*	ESALQ-1306	Brazil[b]	beans, strawberry, soybean	*Fusarium solani* f.sp. *phaseoli*, *Rhizoctonia solani*, *Sclerotinia sclerotiorum*
Trichodermil Super SC 1306	*T. harzianum*	ESALQ-1306	Brazil[b]	beans, strawberry, soybean	*Fusarium solani* f.sp. *phaseoli*, *Rhizoctonia solani*, *Sclerotinia sclerotiorum*
Tricho-Guard	*T. asperellum*	BV-10	Brazil[b]	permitted for use on all crops	*Rhizoctonia* spp.
TrichoPlus®	*T. fertile*	JM4 1R	Africa[j]	permitted for use on all crops	*Rhizoctonia solani*, *Pythium* spp., *Sclerotinia* spp., *Fusarium* spp., *Phytophthora* spp.

Table S1. Continuation.

Name of products	Species	Strain	Registered in	Protected crops	Target pathogens
Trichosoil	*T. harzianum*		Uruguay[k]	garlic, pepper, lettuce, tomato, clove, roses	*Rhizoctonia* spp., *Pythium* spp., *Botrytis* spp.
Tricho-Turbo	*T. asperellum*	BV-10	Brazil[b]	permitted for use on all crops	*Rhizoctonia* spp.
Tric-O	*T. harzianum*		Chile[d]	permitted for use on all crops	*Alternaria* spp., *Botrytis cinerea*, *Cladosporium* spp., *Fusarium* spp., *Geotrichum candidum*, *Venturia* spp.
Tricovab	*T. stromaticum*		Brazil[b]	cocoa trees	*Moniliophthora perniciosa*
Tri-Soil	*T. atroviride*	I-1237	France[l]	carrot, lettuce, potato, ornamentals	*Pythium* sp., *Rhizoctonia solani*
Tritter	*T. harzianum*		Brazil[b]	permitted for use on all crops	*Rhizoctonia solani*, *Sclerotinia sclerotiorum*
Trychonyd FR25	*T. harzianum*	CCT 6550	Brazil[b]	permitted for use on all crops	*Sclerotinia sclerotiorum*
Tusal	*T. asperellum*	T25	EU Members[e]	tomato, pepper, cucumber, courgetti	*Phytophthora* spp., *Fusarium* spp., *Rhizoctonia solani*, *Pythium* spp., *Sclerotinia sclerotiorum*
Unite	*T. atroviride*		New Zealand[g]	organic and conventional crops, orchards, vineyards, cropping and outdoor vegetables, woody trees	*Pythium* spp., *Rhizoctonia* spp., *Phytophthora* spp., *Cylindrocarpon* spp.
Vinevax Bio-dowel	*T. atroviride*	5 strains	New Zealand[g], Australia[h]	grapevines, fruit trees	*Eutypa lata*, *Botryosphaeria stevensii*, *Chondrostereum purpureum*
Vinevax Pruning Wound Dressing	*T. atroviride*	5 strains	New Zealand[g], Australia[h]	pip and stone fruit trees, ornamental trees, shrubs, grapevines	*Eutypa lata*, *Botryosphaeria* spp., *Phaeomoniella chlamydospora*
Vintec	*T. atroviride*	SC1	USA[c], EU Members[e]	grapevines (ornamental, nursery), almonds (dormant application)	*Phaeomoniella chlamydospora*, *Phaeoacremonium aleophylum*, *Diplodia seriata*, *Eutypa lata*, *Eutypa armenicae*, *Botryosphaeria ribis*
Virisan	*T. asperellum*	TV1	EU Members[e]	tomato (greenhouse, professional)	*Pythium* spp., *Rhizoctonia* spp., *Phytophthora* spp., *Phoma* spp., *Verticillium* spp., *Fusarium* spp.

Table S1. Continuation.

Name of products	Species	Strain	Registered in	Protected crops	Target pathogens
Walker	*T. afroharzianum* (formerly *T. harzianum)*	T-22	Brazil[b]	permitted for use on all crops	*F. oxysporum* f.sp. *lycopersici*, *Sclerotinia sclerotiorum*
Xilon WP	*T. asperellum*	T34	Poland[m]	tomato, pepper, cloves, ornamentals	*F. oxysporum* f.sp. *dianthi*, *Pythium* sp., *Dianthus* sp.

[a] These biological products have been registered for use in India by Central Insecticide Board and Registration Committee of the Government of India (Available online: http://ppqs.gov.in/divisions/cib-rc/bio-pesticide-registrant; https://bioprotectionportal.com/india; accessed on 24 January 2022)
[b] These biological products have been registered for use in Brazil by the Ministério da Agricultura, Pecuária e Abastecimento (Available online: https://www.gov.br/agricultura/pt-br/; https://bioprotectionportal.com/brazil; accessed on 24 January 2022)
[c] These biological products have been registered for use in USA by the United States Environmental Protection Agency (EPA) (Available online: https://www.epa.gov/ingredients-used-pesticide-products/biopesticide-active-ingredients; accessed on 24 January 2022)
[d] These biological products have been registered for use in Chile by Servicio Agrícola y Ganadero (Available online: https://www.sag.gob.cl/; https://bioprotectionportal.com/chile; accessed on 24 January 2022)
[e] These biological products have been registered for use in Member States of the European Union by the European Commission (Available online: https://ec.europa.eu/food/plants/pesticides/eu-pesticides-database_en; accessed on 24 January 2022)
[f] These biological products have been registered for use in Canada by the Canadian Food and Inspection Agency (CFIA) or Health Canada (Available online: https://inspection.canada.ca/eng/1297964599443/1297965645317/; https://www.canada.ca/en/health-canada.html/; accessed on 24 January 2022)
[g] These biological products have been registered for use in New Zealand by the Ministry for Primary Industries (Available online: https://eatsafe.nzfsa.govt.nz/web/public/acvm-register; http://agrimm.co.nz/new-zealand/; accessed on 24 January 2022)
[h] These biological products have been registered for use in Australia by the New South Wales Environment Protection Authority (EPA) (Available online: https://www.epa.nsw.gov.au/; https://services.apvma.gov.au/Pubcris; http://agrimm.co.nz/australia/; accessed on 24 January 2022)
[i] This biological product has been registered for use in Uganda by the Ministry of Agriculture, Animal Industry and Fisheries (MAAIF) of Uganda (Available online: https://www.agriculture.go.ug/; https://realipm.com/products/mazao-sustain/; accessed on 24 January 2022)
[j] This biological product has been registered for use in Africa by the Department of Agriculture, Land Reform and Rural Development (DALRRD) (Available online: https://www.agro.basf.co.za/en/Products/Overview/Fungicide/TrichoPlus.html; accessed on 24 January 2022)
[k] This biological product has been registered for use in Uruguay (Available online: https://www.lageycia.com/en/producto.php/32; accessed on 24 January 2022)
[l] This biological product has been registered for use in France (Available online: https://ephy.anses.fr/ppp/tri-soil; accessed on 24 January 2022)
[m] This biological product has been registered for use in Poland by the Ministry of Agriculture and Rural Development (Available online: https://www.gov.pl/web/rolnictwo/wyszukiwarka-srodkow-ochrony-roslin---zastosowanie; accessed on 24 January 2022)