

BASF Nursery & Protected Cropping Solutions

Product Range Guide



BASF are dedicated to continued investment in the nursery and protected cropping industries.

Our team strive to maintain a focus in our research and development on creating a rounded portfolio of weed, disease and insect management on and around nursery stock. For over 150 years BASF have developed innovations that focus on current and pressing challenges.

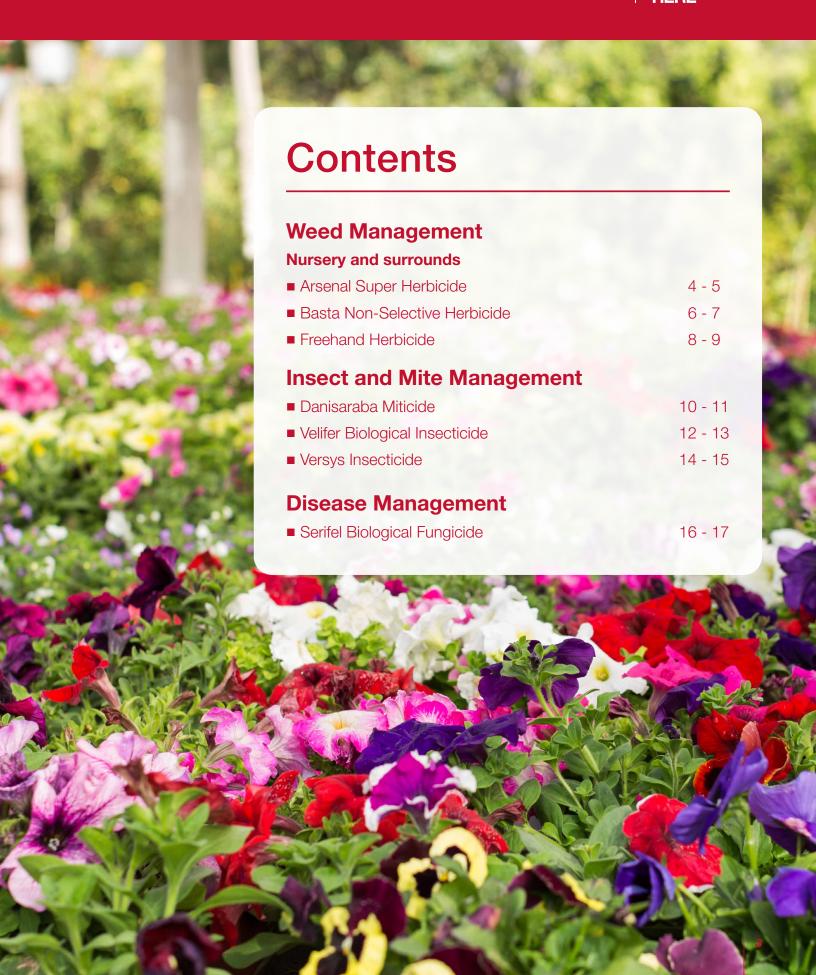
This BASF Nursery and Protected Cropping Product Range Guide is a culmination of research in this industry segment and showcases the unique technologies, unmatched in efficacy and performance, which lay the foundation for nursery management.

Nurseries are dynamic high throughput growing environments placing them at risk of a range of pests and diseases. BASF Nursery and Protected Cropping Solutions are developed to support good cultural practices to ensure you present the best quality stock to your customers.

Kiana Barrie-Gresham

Technical Development Specialist BASF Professional and Specialty Solutions We have invested in, and developed solutions to address key market needs and provide options that not only outperform current technologies but provide a solution which manage resistance, integrate with cultural and IPM programs and meet customer needs.

We are excited to introduce these technologies to you in a comprehensive, solution focused guide, and look forward to bringing new technologies and innovations to compliment this suite in the near future.



Weed Management - Nursery and Surrounds

Complete knockdown and long-term pre-emergent weed control made easy

Arsenal® Super Herbicide with Transport Technology™ is a unique formulation that provides superior long-term pre- and post- emergent weed control on a wide range grass and broadleaf weeds. Arsenal Super has been specifically designed for non-crop situations where long-term vegetation management is required, such as around nursery structures, fence lines, under seeding and planting tables. The unique formulation provides greater and more effective translocative uptake of the active ingredient and superior rainfastness when compared to other herbicides. Arsenal Super is effective as a stand-alone solution and is also highly compatible with a broad range of herbicides.

- Long-term pre- and post-emergent control for up to six months
- Unique Transport Technology[™] enables rapid uptake and translocation throughout target weeds resulting in optimised efficiency
- Treatment flexibility with suitability for application through a small knapsack or large boomspray
- Suitable as a stand-alone solution or tank mix partner with BASF's Basta® Non-Selective Herbicide

Arsenal Super

Situational use pattern

A broad spectrum weed control solution for ornamental facilities, Arsenal Super offers a diverse use pattern around fixed nursery structures where long-term weed control is imperative. Applications can be made pre- or post- emergence via handgun or knapsack. Arsenal Super stops growth rapidly although symptoms may take over 30 days to develop. Affected plants are discoloured and growth is distorted. Arsenal Super is rapidly absorbed through foliage and roots and translocated throughout the plants.

Do not use where water will be collected for irrigation, or in areas where potted plants roots will be in contact with treated surfaces.

Situation	Weed	States	Rate Critical Comments	
Around agricultural buildings and other farm non-crop situations, commercial, industrial, and public service areas, rights of way and	Arsenal® Super controls a broad range of pre and post emergent grass and broadleaf weeds.	All states	Boom: 4 L/ha Hand gun*: 400ml/ 100L Knapsack*: 40ml/10L	Applications can be made pre or post-emergence. Post-emergence applications also provide pre- emergence control. (refer to label for full application instructions)
waste land, away from desirable vegetation.	Please refer to the product label for full All states Boom: 6 L/ha Hand gun*:		6 L/ha Hand gun*: 4600ml/ 100L Knapsack*:	Applications can be made pre or post-emergence. Post-emergence applications also provide pre- emergence control. (refer to label for full application instructions)
Irrigation channels - supply channels and tail drains leading to recirculation dams only.	rrigation channels - supply channels and tail drains eading to ecirculation dams Residual activity is maximised when applied to bare or low		Boom: 3 L/ha Hand gun*: 300ml/ 100L Knapsack*: 430ml/10L	Apply during the non-crop season and when the channel is not in use. Drain channels to be treated prior to use. Apply only to irrigation delivery and recirculation channels which may be flushed to a recirculation dam or settling pond. Do NOT apply where flushing water cannot be disposed of safely on-farm. Water from the initial flushing of treated channels must be retained onfarm. Applications can be made pre or post-emergence. Post-emergence applications also provide preemergence control. (refer to label for full application instructions)

^{* 100}L & 10L Hand Gun and Knapsack rates provided in the table above are calculated on 1000L spay volume per hectare. Any deviation in spray volumes above or below 1000L/ha will require recalibration.

Refer to the product label for full directions for use table.

Packaging

Available in 10L bottles



Weed Management - Nursery and Surrounds

The powerful knockdown alternative

Basta® Herbicide is a non-selective knockdown with a well-deserved reputation for versatility, effectiveness and a high level of non-target plant safety. Basta is a partially systemic herbicide which is labelled for the control of over 80 of the toughest weeds. Basta also provides users with faster weed control and improved levels of non-target safety when compared to glyphosate alternatives.

- A powerful broad-spectrum alternative to glyphosate which controls over 80 troublesome weeds
- Superior non-target safety and target weed control of the toughest weeds whilst minimising damage to desired non-target plants
- Effective control for glyphosate resistant weeds with an alternative mode of action
 Group N
- Broad use pattern across a range of non-crop situations
- Compatible with BASF's Arsenal® Super for up to 6 months of broad-spectrum pre-emergent weed control





A broad-spectrum herbicide for use in nursery stock (seedlings, plugs, potted colour, trees, shrubs, foliage plants, palms, grasses, fruit trees, cut flowers), Basta can be applied through a boom spray or handgun. Basta herbicide can be applied as necessary to actively growing weeds up to a maximum of three applications per season. Despite its versatility, nurseryman should avoid spraying Basta when crops are in flower or fruiting.

B. COMMERCIAL, INDUSTRIAL, NON-AGRICULTURAL AREAS, FENCELINES IN AGRICULTURAL AREAS and FORESTRY PLANTATIONS

Crop/Situation	Weeds	State	Rate	WHP	Critical Comments
Commercial & industrial areas, forest plantations, rights-of-	Please refer to the product	All States	1.0 to 5.0 L/ha	-	Determine the recommended rate of use by considering the criteria WEED SPECIES, WEED STAGE OF GROWTH, WEED DENSITY and CLIMATIC CONDITIONS as described above in Part A of the Directions for Use table, under Critical Comments.
way and other non- agricultural areas	label for full list of weeds				Warnings: Do not allow spray or spray drift to contact desirable plants. To avoid potential crop damage refer to the label sections on Application and PROTECTION OF CROPS, NATIVE AND OTHER
Fencelines in agricultural areas	controlled.			- (8 weeks if grazing)	NON-TARGET PLANTS.
Commercial & industrial areas, forest plantations, rights-of-way and other non-	Volunteer or wildling Pinus spp.		Handgun and knapsack application	-	Basta is a non-selective herbicide and will affect most weeds. Its forestry use is designed to improve the control of Pinus spp. wildings when pre-plant weed control is carried out. To broaden the weed spectrum, mixing with other herbicides such as glyphosate and metsulfuron-methyl at labelled rates may be necessary.
agricultural areas			500 mL/		APPLICATION
	_		100 L water	-	Apply with an adjuvant. The addition of an adjuvant e.g. Nu-Film® P or Exit® may assist in improving performance.
Forestry plantations (pre-plant plantation establishment)			5 L /ha		High water volumes or nozzle systems should be used to achieve complete coverage of weeds, which is essential for good control.
occusiooy					Handgun and knapsack rates are based on the application of 1000 L of spray mixture per sprayed hectare. This is usually adequate to thoroughly wet dense stands of weeds. Less dense stands will require lower water rates. Basta does not provide residual weed control. Refer also to comments in the General Instructions which relate to application.
					WEED GROWTH STAGE AND CONDITION
					Use on Pinus spp. ≤ 15 cm is recommended to maximise efficacy. Apply when weeds are actively growing. Results will be reduced if treated plant is under stress due to very dry, very wet, frosty or diseased conditions.
					COVERAGE
					Complete coverage of target is essential for good control. Poor coverage may result in re-growth.
					CLIMATIC CONDITIONS
					Best results are achieved when applied under warm, humid conditions (temperatures below 33 °C with a relative humidity above 50 %). Good results will be achieved under most other conditions, however poor results may occur under hot, dry conditions.
					Trials have shown better results from autumn and winter applications than from spring and summer applications.
					SYMPTOMS
					Visible symptoms will appear within 3 weeks; tree death may take several months depending on initial coverage and size of tree. Follow up treatments may be necessary to control re-growth in some cases.

D. OIL TEA TREE, NURSERY STOCK (NON FOOD), FOLIAGE, CUT FLOWERS, WILDFLOWERS

Crop/ Situation	Weeds	State	Rate	WHP	Critical Comments
Oil tea tree	Please refer to the	All States	Boom spray:	- (8	Apply spray treatment along the sides of crops and between rows of crops. Avoid overspray or incidental spray drift onto crop, as damage or death of plants may occur.
Nursery stock [(non-food) – seedlings, plugs, potted colour, trees, shrubs, foliage plants, palms, grasses, fruit trees (non- bearing)], cut flowers including wildflowers and foliage. Wildflower crops.	product label for full list of weeds controlled and directions for use.		1 to 5 L/ha Hand-gun: 300 to 500 mL/100 L	weeks if grazing)	Apply as necessary to actively growing weeds up to a maximum three applications per season. Use suitable ground application equipment. Ensure equipment is correctly calibrated. Use higher rates for perennial grass weeds. Increase the application rate as the size of target weeds increases. Only apply spray to actively growing grass weeds free from environmental stresses. Avoid spraying when crops are in flower or fruiting.

Refer to the product label for full directions for use table.

Packaging

Available in 20L bottles

Weed Management - Container & In-ground Ornamentals

Powerful pre-emergent control for the toughest weeds

Freehand® Herbicide offers the ornamental grower a new tool for pre-emergent weed control of broadleaf and grassy weeds. Its two unique active ingredients, pendimethalin and dimethenamid-P, prevent weeds from growing and multiplying by inhibiting cell growth in seedling shoots and impeding plant cell microtubule assembly in roots. This powerful herbicide is labelled for the control and suppression of more than 60 of the toughest, most troublesome weeds, promoting higher quality and more marketable plants.

- Unique combination of two modes of action (Groups D and K) for broader spectrum weed control and resistance management
- Safe on a broad range of ornamental crops providing up to three months of control and suppression of weeds
- Easy-to-use granular formulation and particle distribution allows for easy spreading and flexible application rates
- Extended residual control for up to three months without the need to be watered in immediately

Apply evenly over the area or pots to be treated preferably using a properly calibrated mechanical granule spreader. Apply to the surface of weed free soil preferably after cultivation or just after potting up. Freehand will not control established weeds. Apply to dry foliage only and then sprinkler irrigate or hose (10-15 mm) to wash granules from foliage and incorporate the herbicide into the soil. One application will last for 2-3 months depending upon rainfall, irrigation, soil type (potting mix), temperature and weed seed burden. Retreat when the first signs of weed growth are seen but no sooner than 2 months and no later than 3 months after the first application.

Do not apply Freehand 2 weeks prior to or 2 weeks after leaf bud break or during periods of flush growth. Newly formed leaves are sensitive to this product. Spotting or leaf drop may result from such applications. Do not apply directly on to bare roots of woody ornamentals as injury may occur.

Situation	Weeds	Rate	Critical Comments				
Container & in-ground Ornamental plants Recreational Turf:	Freehand Herbicide controls and	100 kg/ha or	Apply evenly over the area or pots to be treated preferably using a properly calibrated mechanical granule spreader. Apply to the surface of weed free soil preferably after cultivation or just after potting up.				
Including but not limited to: fairways, golf tees, municipal sports fields, industrial	suppresses a wide range of broadleaf and grassy weeds.	1 kg/100 square metres or	Freehand will not control established weeds. Apply to dry foliage only and then sprinkler irrigate or hose (10 - 15mm) to wash granules from foliage and incorporate the herbicide into the soil.				
commercial and domestic lawns.	Please refer to the product label for full weed species	10 g/square metres	Do not apply Freehand to wet foliage – should this happen irrigate or hose immediately to remove granules from the leaf surface.				
Warm Season Turf species only:			Follow the precautions listed below to avoid unnecessary plant damage and to obtain optimum weed control.				
Hybrid Couch (Cynodon dactylon, Cynodon transvaalensis)	listings and directions for use.		One application will last for 2 - 3 months depending upon rainfall, irrigation, soil type (potting mix), temperature and weed seed burden.				
Common Couch (Cynodon dactylon)			Retreat when the first signs of weed growth are seen but no sooner than 2 months and no later than 3 months after the first application.				
QLD Blue Couch			Ornamentals				
(Digitaria didactyla) Carpet Grass		200 kg/ha	Do not apply Freehand 2 weeks prior to or 2 weeks after leaf bud break or during periods of flush growth. Newly formed leaves are sensitive to this product. Spotting or leaf drop may result from such applications.				
(Axonopus compressus) Kikuyu (Pennisetum clandestinum)		2.0 kg/100 square metres or 20 g/square metres	Do not apply directly on to bare roots of woody ornamentals as injury may occur.				
Buffalo (Stenotaphrum secundatum) Zoysia			Turf Apply prior to germination of weeds (typically from early spring through to late summer early Autumn).				
(Zoysia japonica and Zoysia matrella)			Delay overseeding of treated turfgrass for at least 3 months after last application.				
·			Application of Freehand to newly sodded areas must be delayed until turfgrass root system has been well established and turfgrass mowed at least 2 times.				

Refer to the product label for full directions for use table.

Packaging

Available in 22.7kg bags



Insect & Mite Management

An innovative miticide that's hard on spider mites and soft on beneficials

Danisaraba® Miticide introduces a highly effective new mode of action that's ideal for first-line control of two-spotted mite, European red mite and Bryobia mite across all life stages. Danisaraba not only provides growers with unmatched mite control, but also optimal compatibility with beneficial predators.

- Gives growers the stopping power to gain immediate control of infestations
- Rapid, targeted control of two-spotted, red and Bryobia mites at all life stages
- Compatible with Integrated Pest Management and beneficial release programs
- A novel mode of action to reduce resistance pressure on other miticides
- Up to 21 days residual control and rainfast after 1 hour



Danisaraba®

Situational use pattern

Danisaraba Miticide is not systemic and does not have translaminar activity. Apply in sufficient water to ensure thorough coverage to the point of runoff and penetration of the target plants. Monitor crops and commence applications before local threshold levels are reached. Continue to monitor crops and make subsequent applications after 14 days where necessary. Apply a maximum of 2 sprays per growing season.

Crop	Pest	Rate	WHP	Critical comments
Ornamentals, including Chrysanthemum, Cyclamen, Fuchsia, Gerbera daisy, Rose and African violets (Saintpaulia spp.) (field and protected)	Two spotted mite (Tetranychus urticae) European red mite (Panonychus ulmi) Bryobia mite (Bryobia spp.)	100mL/ 100L		Monitor crops and commence applications before local threshold levels are reached. Continue to monitor crops and make subsequent applications after 14 days where necessary. Apply a maximum of 2 sprays per growing season. Alternate the applications of DANISARABA MITICIDE with a miticide from a different Mode of Action. Refer to the Crop Life Australia Guidelines for resistance management. DANISARABA MITICIDE is not systemic and does not have translaminar activity. Apply in sufficient water to ensure thorough coverage to the point of runoff and penetration of the target plants. The addition of an appropriate adjuvant may aid in speed of knockdown and the overall control. Test the safety and compatibility of all adjuvants before use. Always read and follow the specific adjuvant label using the correct concentration of adjuvant to avoid plant injury. For ornamentals not listed on the label, a small test application to assess for phytotoxicity should be made before spraying the whole crop.

Refer to the product label for full directions for use table.

Packaging

Available in 5L bottles



Insect & Mite Management

Adding versatility with biologicals

Velifer® Biological Insecticide is an exciting new non-chemical solution to manage a wide range of key pests, adding more versatility to spray programs. Complimentary to Integrated Pest Management (IPM) programs, Velifer effectively targets all insect life stages combatting resistance to conventional insecticides. Safe to most beneficial pest species, Velifer can be applied multiple times throughout all growing stages of the crop and is non-phytotoxic to ornamentals. With sustainability goals becoming front of mind for customers and consumers it has never been more imperative to diversify your defence with biologicals.

- Compatible with IPM programs, Velifer offers versatility in spray programs and combats the resistance to conventional insecticides
- Offering versatility of application, Velifer can be applied multiple times throughout all growing stages of the crop
- Effective against all insect life stages, including eggs, larvae/nymph and adults
- Non-phytotoxic to ornamentals and safe to most beneficial pest species including pollinator insects





Velifer Biological Insecticide is best used on low pest populations to maintain pressure below economic damage threshold. Spray sufficient Velifer/water mixture, to obtain full crop coverage, but not to the point of run off. Velifer Biological Insecticide is a contact insecticide and it is essential that the spores make contact with all the insects, to be treated. Apply, as a full cover film spray, using conventional spray equipment. Good coverage is essential, but not to the point of run off. Due to UV sensitivity, it is recommended that Velifer is applied during the **afternoon**, **or evenings**.

Situation	Pest	Rate	WHP	Critical Comments
Protected vegetables and ornamentals	Suppression of Western Flower Thrips (Frankliniella occidentalis) Onion Thrips (Thrips tabaci) Greenhouse Whitefly (Trialeurodes vaporarium) Silverleaf Whitefly (Bemisia argentifolii) Sweet Potato Whitefly (Bemisia tabaci)	50 ml / 100 L	0 days	Apply when pests are first detected in the crop or above economic thresholds. Repeat applications are to be made as necessary at an interval of 3-14 days. Use shorter application intervals when insect pressure is higher.
	Suppression of Green Peach Aphid (Myzus persicae) Rose Aphid (Macrosiphum rosae) Chrysanthemum Aphid (Macrosiphoniella sanborni) Two Spotted Spider Mite (Tetranychus urticae)			Generally, 3 consecutive weekly applications are required for adequate pest suppression. Velifer biological insecticide should be applied in a water volume ranging from 500 to 2500 L/ha.
				It is important to ensure coverage on the bottom side of the leaves where pests might be located. In higher pest situations, Velifer biological insecticide is best used within an Integrated Pest Management program in conjunction with a chemical insecticide.

Refer to the product label for full directions for use table.

Packaging

Available in 5 Litre bottles



Insect & Mite Management

For rapid and targeted control of aphids, whitefly and mealybug in ornamentals & nursery stock

Versys® Insecticide is a pioneering solution from BASF that provides effective control of aphids, whitefly and mealybug in ornamentals & nursery stock plants. Versys offers a unique mode of action subgroup (9D) with no known cross-resistance to other insecticides. With the recent label extension adding whitefly and mealybug species, Versys Insecticide provides growers with class leading control of key pests, with the added benefit of long-term resistance management. Versys affects all life stages from eggs to adults. It exhibits a favourable environmental profile with low acute toxicity to mammals, fish, birds, beneficial insects and pollinators. Versys delivers long lasting control of problem pests, resulting in clean plants of exceptional quality, whilst also providing the convenience of no withholding periods when used in ornamentals and nursery stock.

- Fast acting with long residual control disrupting the sensory response of target pests
- Low impact to beneficials including colony health and development
- Compatible in IPM programs with a unique MOA subgroup
- Affected aphids stop feeding within a few minutes preventing the transmission of viruses and diseases spread by these insects



Versys Insecticide disrupts insect behaviour and feeding and will provide slow knockdown. Versys Insecticide will provide residual control of aphids out to 21 days. Apply a maximum of 2 sprays before rotating to an alternative insecticide for aphid control. Do not apply more than 4 applications per crop. Apply in sufficient water to ensure thorough coverage of the target crop.

Crop	Pest	Rate	WHP	Critical Comments
Ornamentals & Nursery Stock including: (NON-FOOD) seedlings, tubes and plugs, potted colour, trees and shrubs, foliage plants, cut flowers, palms and grasses and fruiting plants (NON-BEARING) (field and protected)	Green peach aphid (Myzus persicae) Cabbage aphid (Brevicoryne brassicae) Currant lettuce aphid (Nasonovia ribis-nigri) Cotton aphid / Melon aphid (Aphis gossypii) Rose aphid (Macrosiphum rosae)	10mL/100L	10mL/100L -	Versys Insecticide disrupts insect behaviour and feeding and will provide slow knockdown. Monitor crops and commence applications as local threshold levels are reached. Versys Insecticide will provide residual control of aphids out to 21 days. Continue to monitor crops and make subsequent applications after 14 days where necessary. Apply a maximum of 2 sprays before rotating to an alternative insecticide for aphid control.
	Greenhouse whitefly (Trialeurodes spp.) Silverleaf whitefly (Bemisia tabaci Biotype B) Citrus mealybug (Planococcus spp.) Long-tailed mealybug (Pseudococcus spp.)	33-30Hii/ 100L		Do not apply more than 4 applications per crop. Apply in sufficient water to ensure thorough coverage of the target crop. Addition of an adjuvant may aid in speed of knockdown and the overall control. For suitable adjuvants refer to the Adjuvant section in Compatibility on the label.

Refer to the product label for full directions for use table.

Packaging

Available in 1 Litre bottles



Disease Management

Battling resistance with biologicals

With sustainability at the forefront of grower and nurserymans' minds, Serifel offers growers a ground-breaking biological alternative to traditional chemical modes of action. Its high loading of pure spores, Bacillus amyloliquifaciens strain MBI600, allows low application rates while guaranteeing low environmental impact and toxicity.

- Unique mode of action
- Low environmental impact and toxicity
- Lower spray rate compared to other biologicals
- No cross-resistance between Serifel and conventional chemical fungicides
- Compatible with Velifer® Biological Insecticide





Apply preventatively, prior to an infection period and development of disease only. Use higher rate when high disease pressure is expected. Continue applications on a 3–14-day interval as required. DO NOT apply more than 10 applications per crop. Serifel is best applied as part of an integrated disease management program.

FOLIAR APPLICATION:

Apply using ground-based spray equipment in an adequate spray volume to ensure thorough coverage of all plant surfaces.

SOIL DRENCH:

Apply soil drench using calibrated drenching equipment to thoroughly soak.

Crop	Pest / Disease	Rate
NURSERY STOCK	SUPPRESSION ONLY	50-75g / 100L
(NON-FOOD): Seedlings, tubes and plugs, potted colour, trees and shrubs, foliage plants, palms, grasses, fruiting plants (non-bearing), cut flowers, ornamentals.	FOLIAR DISEASES Alternaria leaf spot (Alternaria spp.) Anthracnose (Colletotrichum spp.) Cercospora leaf spot (Cercospora spp.) Downy Mildew (Peronospora spp.) Grey Mould (Botrytis cinerea) Powdery Mildew (Erysiphe/Leveillula/Podosphaera/ Sphaerotheca spp.) Rust (Puccinia spp.) White Mould/Watery soft rot (Sclerotinia spp.) SOIL DISEASES Fusarium Wilt (Fusarium spp.) Leaf Drop (Sclerotinia spp.) Phytophthora Root Rot (Phytophthora spp.) Pythium Damping Off (Pythium spp.) Rhizoctonia Rot (Rhizoctonia spp.) Verticillium Wilt (Verticillium spp.)	50-75g / 100L

Refer to the product label for full directions for use table.

Packaging

Available in 2kg buckets



Arsenal Super

Herbicide

Freehand

Herbicide

Velifer

Biological Insecticide

Serifel

Biological Fungicide

Basta®

Herbicide

Danisaraba

Miticide

Versys

Insecticide

For more information on Arsenal® Super, Basta®, Freehand®, Danisaraba®, Velifer®, Versys® and Serifel® visit turf-solutions.basf.com.au or call 1800 558 399