



Protection technology. Rapeseed

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CLEARFIELD® technology

- NOPASARAN®
- CARAMBA®
- CARAMBA DUO®
- PICTOR®
- FASTAC®

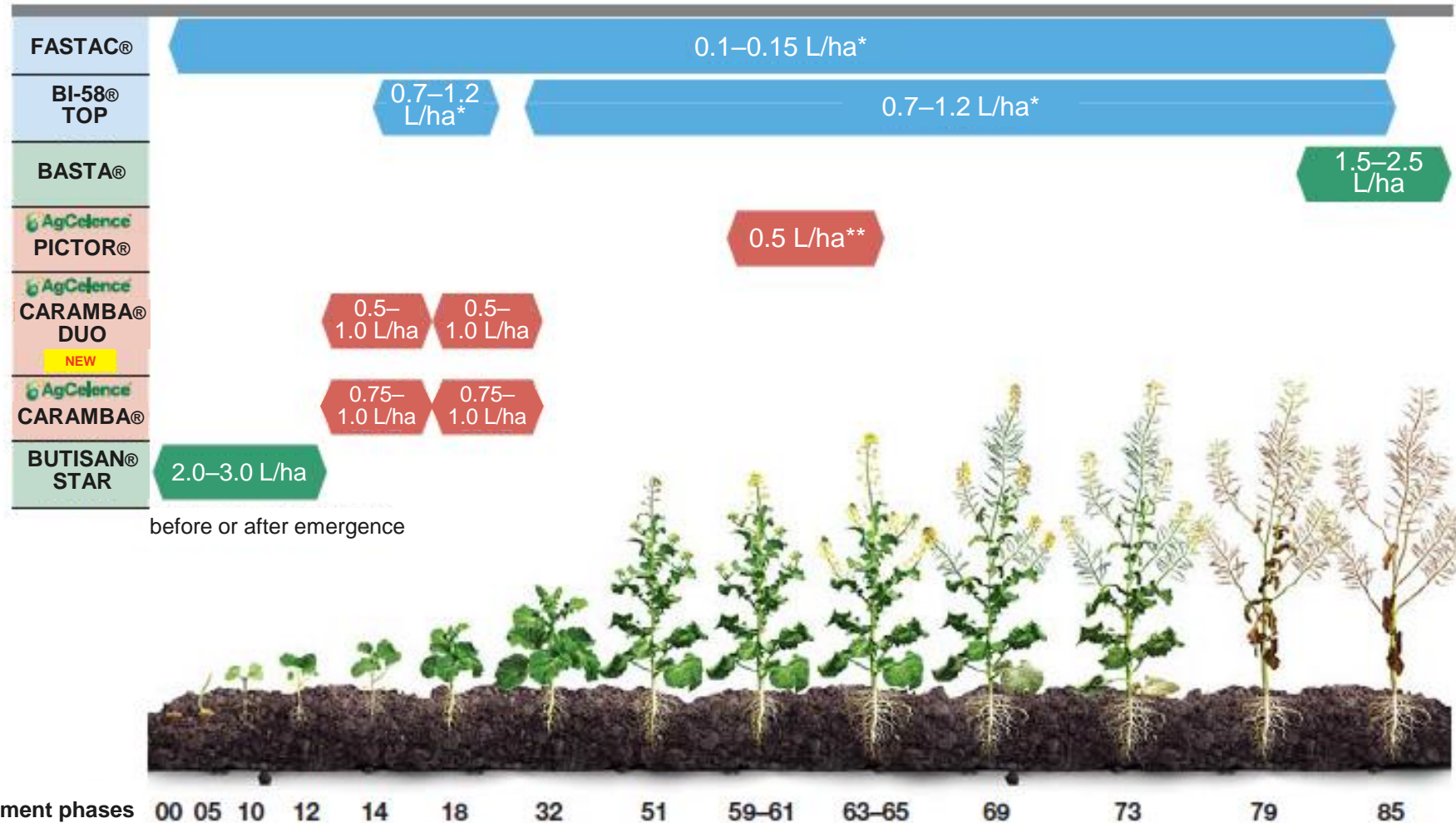
Conventional technology

- BUTISAN STAR®
- CARAMBA®
- CARAMBA DUO®
- PICTOR®
- FASTAC®

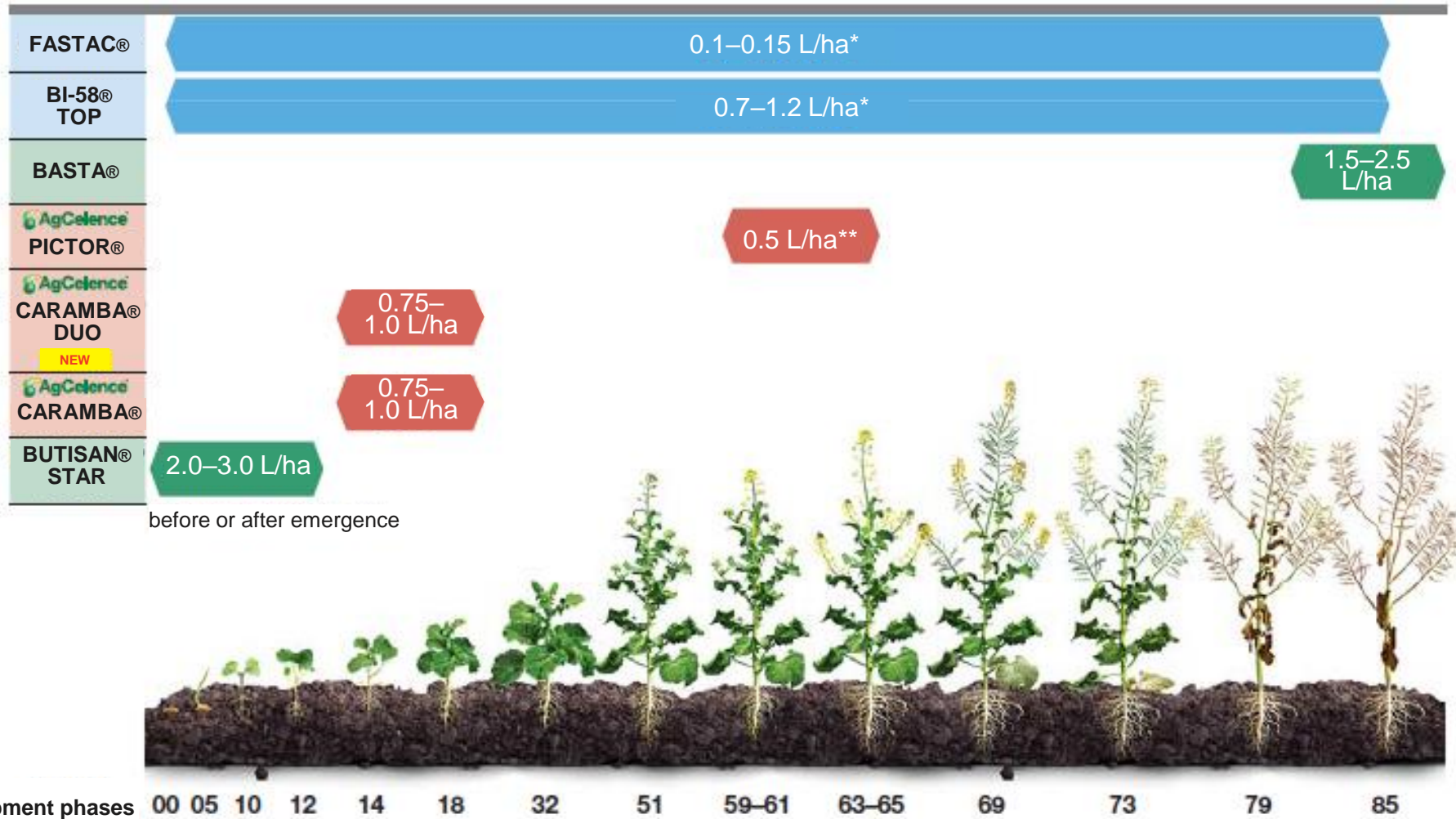
* hybrids resistant to Nopasaran herbicide



Winter rapeseed protection system

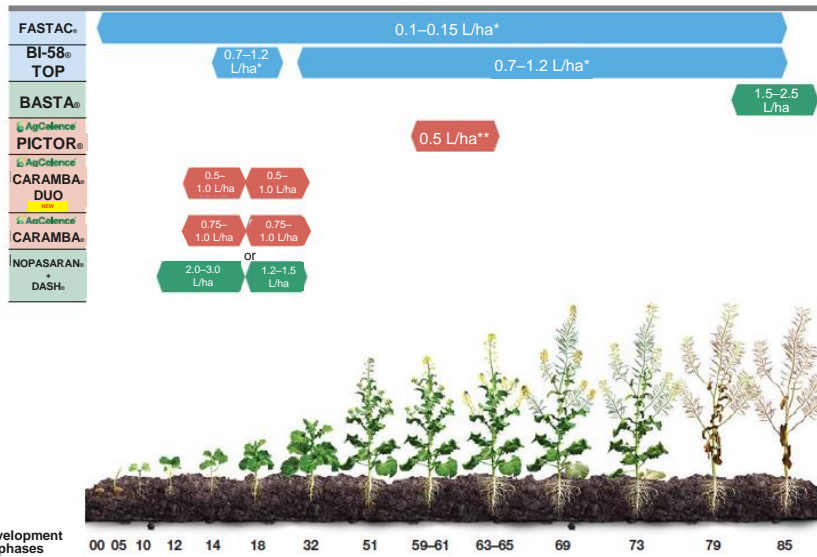


Spring rapeseed protection system

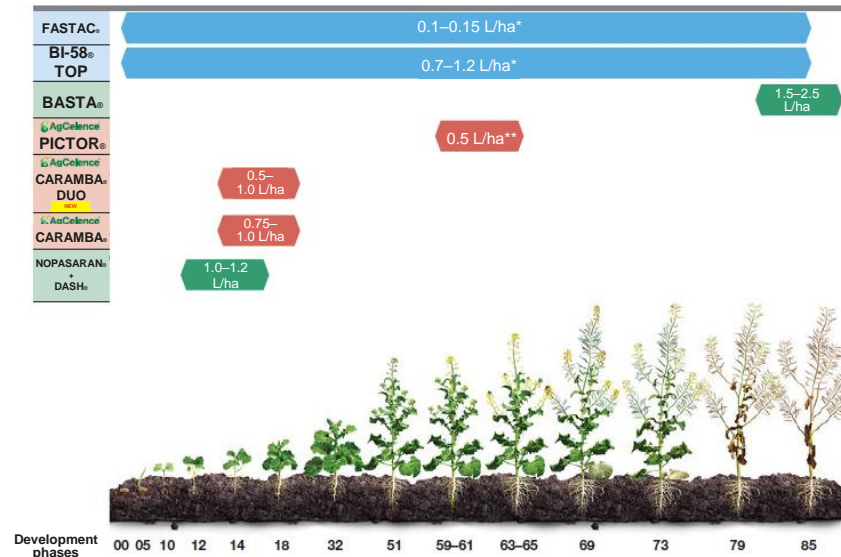




Clearfield® WINTER RAPESEED PROTECTION PROGRAM



Clearfield® SPRING RAPESEED PROTECTION PROGRAM



* Insecticide applications during the flight time will kill bees.

** The best application time for rapeseed is the beginning of petal fall.

BUTISAN STAR®

Only rapeseed in the field





Butisan Star: Description

Active ingredients	Metazachlor 333 g/L Quinmerac 83 g/L
Formulation	Suspension concentrate (SC)
Plant penetration	Absorption by leaves and roots
Effect on weeds	Germination inhibition
Application rate	2–3 L/ha
Weed spectrum	Annual grass and dicotyledonous weeds
Application time	Before emergence—after emergence
Crops	Spring and winter rapeseed



Advantages of Butisan Star herbicide

- Flexible application time: can be used both before and after emergence
- Application time depends only on the weed development phase.
- High efficacy against annual grass and broadleaf weeds in rapeseed crops
- Effective against cleavers and chamomile species
- High selectivity



Butisan Star herbicide: Weed spectrum

Weeds	Butisan Star
	Before or early after emergence
Foxtail grass	++(+)
Fallen grain	+(+)
Annual bluegrass	+++
Windgrass	+++
Wild radish and mustard	+(+)
Veronica	+++
Field pennycress	+(+)
Shepherd's purse	++
Flixweed	++
Chamomile	+++
Foxtail	+++
Cleavers	+++
Cockspur grass	+++
Spurge	++
Thistle	++
Chickweed	+++
Knotweed	+(+)



Clearfield®

Production system for rapeseed



Clearfield®

Production system for rapeseed



NOPASARAN herbicide for rapeseed growing using the CLEARFIELD® system



- Active ingredients: imazamox 25 g/L + metazachlor 375 g/L
- Currently approved: spring rapeseed resistant to Nopasaran herbicide
- Weed spectrum: annual grass and dicotyledonous weeds
- One application per season in the 2–6 leaves phase (taking into account the weed development phase)
- Use mixed with DASH surfactant (1:1)
- Application rate: NOPASARAN 1.2 L/ha + DASH 1.2 L/ha
- Working fluid application rate: 200–400 L/ha
- Protection period: until the end of the season with proper application (destroys emerging weeds and forms a soil screen for the future waves of weeds)



Advantages of the CLEARFIELD® system for rapeseed

Convenience and ease of use:
single application,
flexible timing

High yield potential: a combination
of herbicide with high-yielding
hybrids of leading breeders



Harvest preservation:
broad weed spectrum

High-quality products:
elimination of weeds affecting
glucosinolate and weed content in the
crop



Clearfield®
Production system for rapeseed

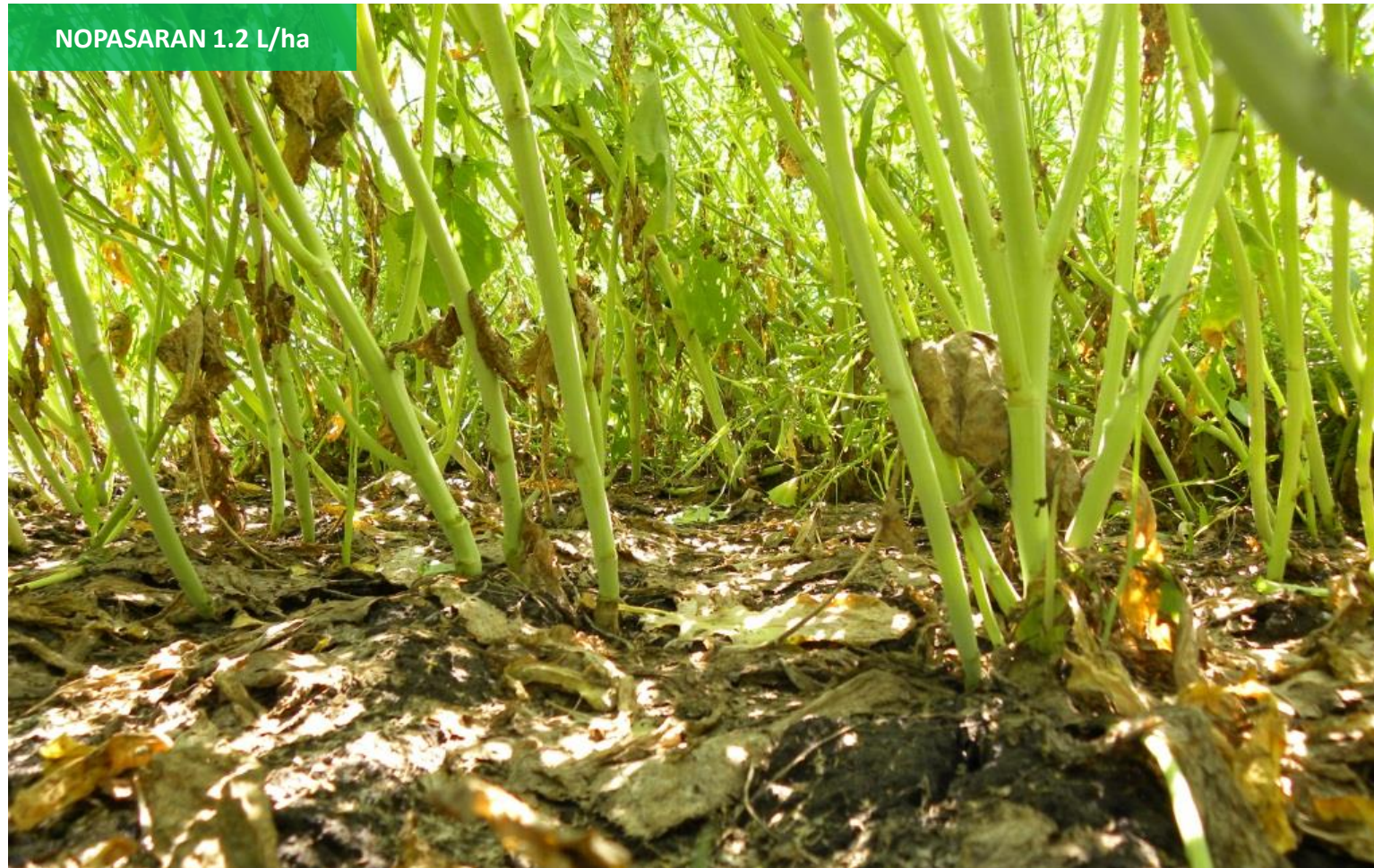
Efficacy of NOPASARAN herbicide on spring rape CL Oryol Region



Efficacy of NOPASARAN herbicide on spring rape CL Tula Region



Efficacy of NOPASARAN herbicide on spring rape CL Tula Region, Volovsky District

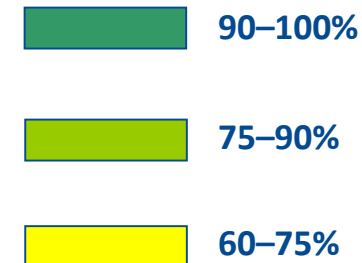




NOPASARAN® herbicide: Weed spectrum

Shepherd's purse	Capsella bursa-pastoris	90–100%
Flixweed	Descurainia Sophia	90–100%
Wild radish	Raphanus raphanistrum	90–100%
Mustard	Sinapis spp.	90–100%
Field pennycress	Thlaspi arvensis	90–100%
Rough cocklebur	Xanthium strumarium	90–100%
Common ragweed	Ambrosia artemisiifolia	75–90%
Fat-hen	Chenopodium album	75–90%
Quickweed	Galinsoga parviflora	90–100%
Cleavers	Galium aparine	90–100%
Chamomile	Matricaria spp.	90–100%
Knotweed	Polygonum spp.	90–100%
Chickweed	Stellaria media	90–100%
Field bindweed	Convolvulus arvensis	75–90%
Velvetleaf	Abutilon Theophrastii	75–90%
Amaranthus	Amaranthus spp.	90–100%
Cockspur grass	Echinochloa crus-galli	90–100%
Foxtail	Setaria spp.	90–100%
Couch grass	Agropyron repens	60–75%
Foxtail grass	Alopecurus myosoides	90–100%
Common wild oat	Avena fatua	75–90%
Creeping thistle	Cirsium arvense	75–90%
Field milk thistle	Sonchus arvensis	75–90%
Blue lettuce	Mulgedium tataricum	75–90%

Efficacy of NOPASARAN with early post-emergence application on spring rape



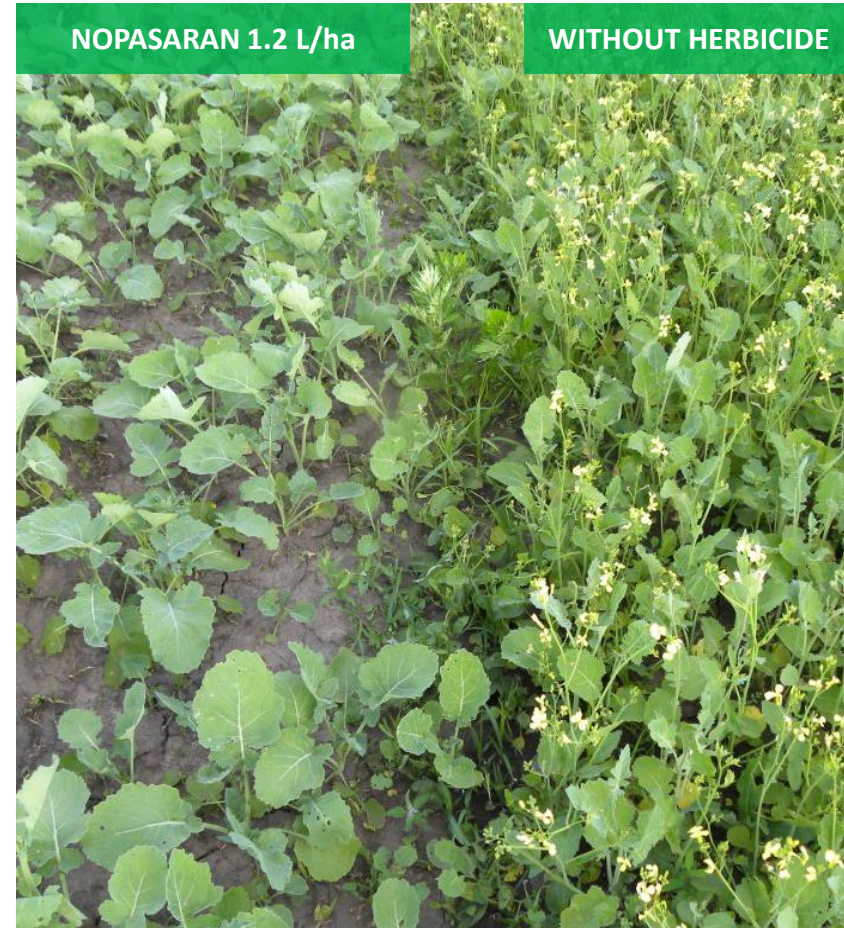
Efficacy of NOPASARAN herbicide against annual and perennial weeds



12 days after application



NOPASARAN eliminates cruciferous weeds in CLEARFIELD rapeseed. Ryazan Region, Korablinsky District





Always use NOPASARAN mixed with DASH



DASH significantly increases the efficacy against grass and dicotyledonous weeds

Caramba Duo®

Double confidence
in yield





Caramba Duo[®]: Description

Active ingredient	Metconazole 80 g/L + pyraclostrobin 130 g/L
Formulation	Emulsion concentrate
Application rate	0.5–1.0 L/ha (1–2 applications), average rate 0.75
Crop	Winter rapeseed, spring rapeseed
Weed spectrum	Activation of form-building processes, improved yield and product quality. Highly effective against Phoma rot and Alternaria spot*
Application time	Spring rapeseed: beginning of stem elongation phase. Winter rapeseed: 4–6 leaves (fall); beginning of stem elongation phase (spring). Working fluid application rate: 200–400 L/ha.
Packaging	4x5 L

*Based on BASF internal experiments

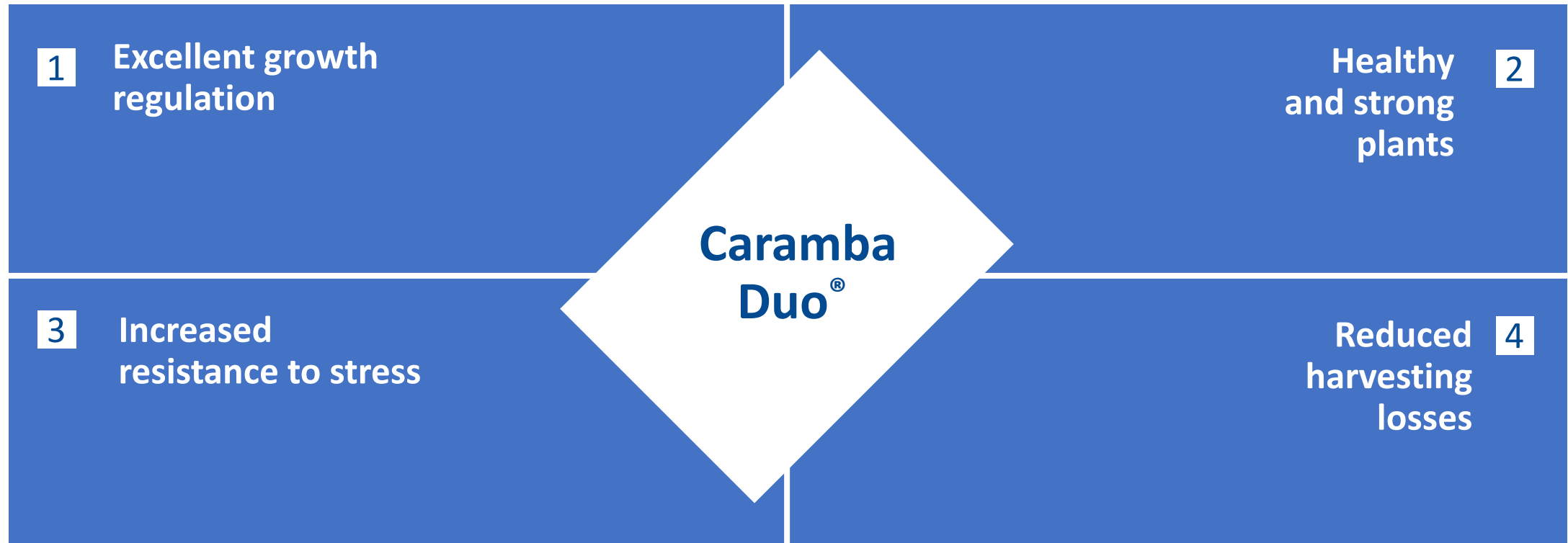
Recommended application rates:

- Winter rapeseed: 0.75–1.0 L/ha for maximum combination effect and overwintering
- Spring rapeseed: 0.5–0.75 L/ha



Caramba Duo[®]: Advantages

The first growth regulator with fungicidal activity on rapeseed in Russia*



*Registration Certificate No. 014-07-1595-01



Caramba Duo[®]: Double confidence in yield

- **The first growth regulator with fungicidal activity on rapeseed in Russia***
- A powerful growth regulator
- Developed specially for rapeseed
- New formulation
- More effective disease control due to the synergy of two active ingredients from different classes (triazoles and strobilurins)
- Increases yield even in the absence of disease due to the powerful
- AgCelence[®] effect:
 - ✓ Increased winter hardiness
 - ✓ Improved root development
 - ✓ Increased branching of rapeseed plants

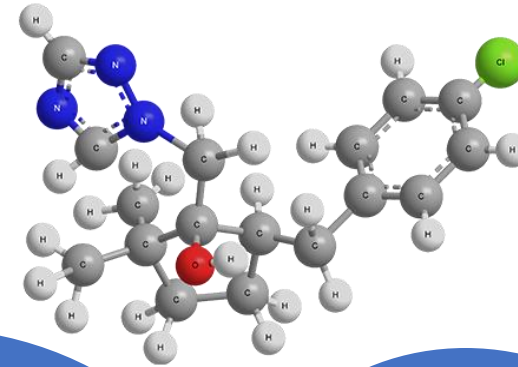


*Registration Certificate No. 014-07-1595-01



Caramba Duo[®]: active ingredient metconazole

Metconazole is a systemic triazole fungicide and growth regulator



Mechanism of action: suppresses ergosterol biosynthesis, resulting in growth inhibition and breakdown of fungal cell membrane

Penetrates plant tissues, with local systemic and acropetal transfer and uniform distribution in aerial parts of plants.



Caramba Duo[®]: active ingredient pyraclostrobin

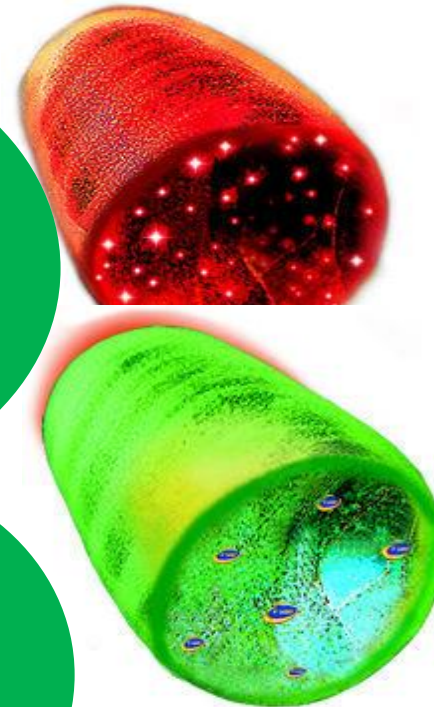


Pyraclostrobin is a strobilurin fungicide

Mechanism of action: inhibits mitochondrial respiration by suppressing electron transfer

Pyraclostrobin molecules remain active for several weeks, providing long-term protection

Disrupts the fungus energy supply, causing its death



Caramba Duo[®]: penetration of the growth regulator / fungicide into rapeseed plants



Under UV light, you can see how the product penetrates the rapeseed plant

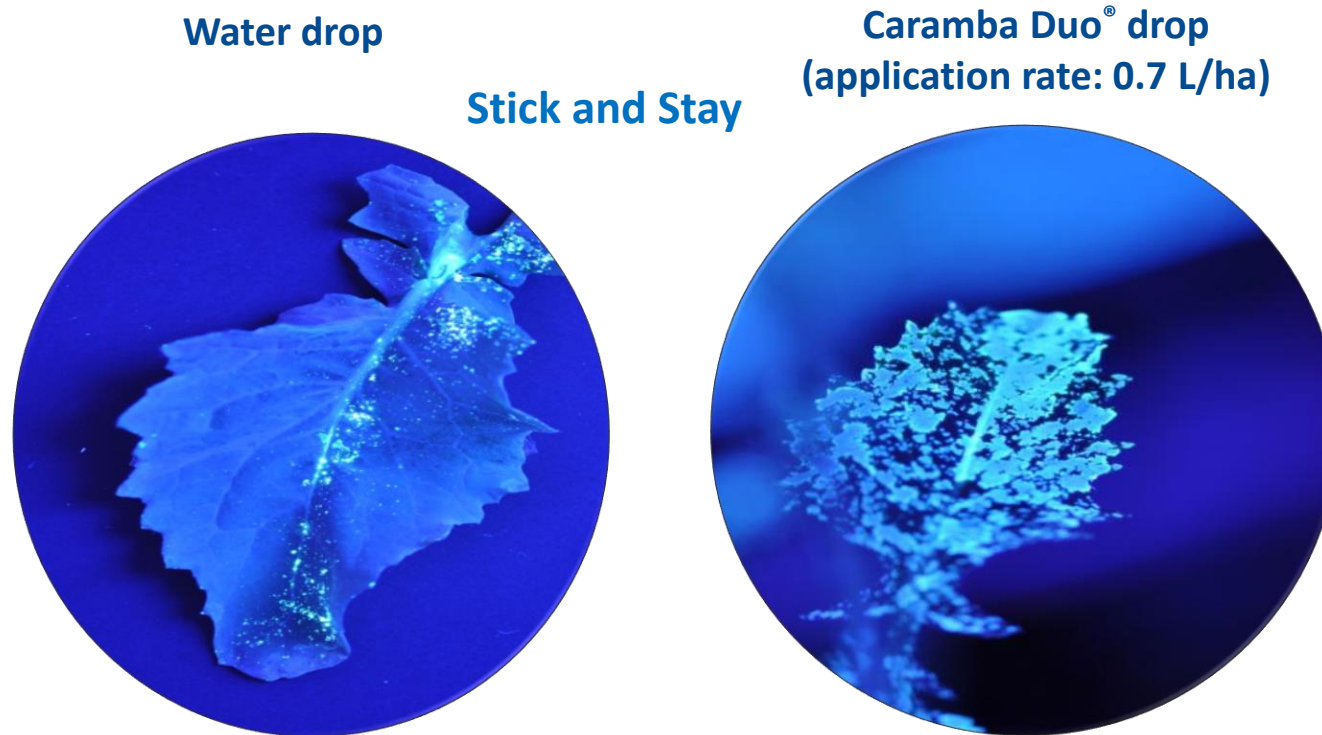
Once on the plant surface, water drops tend to bounce off the leaf or run off

Stick and Stay

Caramba Duo[®] drops are retained on the leaves, spreading and moisturizing the rapeseed leaf surface



CARAMBA Duo[®]: Formulation characteristics



After spraying, Caramba Duo[®] uniformly covers the leaves, ensuring excellent distribution of active ingredients across the entire leaf surface. Water drops are difficult to hold on the surface of rapeseed leaves due to the epicuticular wax crystals that cover them.

Caramba Duo® on spring rapeseed



**Recommended application rate for spring rapeseed:
0.5–0.75 L/ha**

Sibirsky LLC, Novosibirsk Region, 2020.

- Root development
- Inhibition of main stem growth to promote lateral shoot development
- Increase in the number of pods
- Uniform flowering and ripening
- Less cracked pods before harvesting
- Effective against Phoma rot, Alternaria spot*, and downy mildew*

- **Uniform phenological development**
- **Formation of optimal habitus**
- **Easier harvesting**
- **Harvest preservation**

BASF

We create chemistry

AgCelence[®]

Ожидай большего

PICTOR[®] fungicide



Pictor: Fungicide characteristics

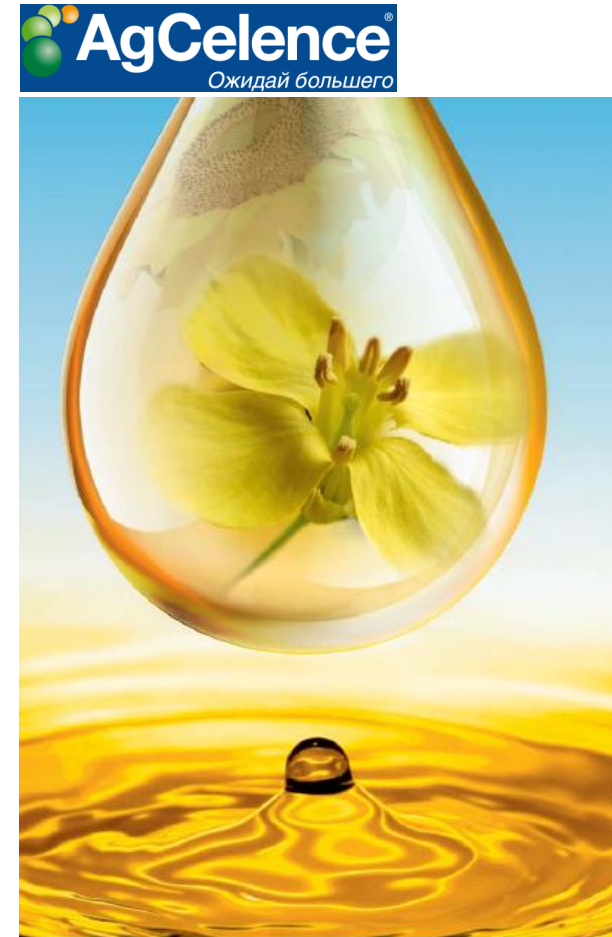


Active ingredients	Boscalid 200 g/L + dimoxystrobin 200 g/L
Formulation	Suspension concentrate (SC)
Action	<ul style="list-style-type: none">• Preventive and curative• Translaminar, local systemic• Inhibits cellular respiration and electron transport
Application rate	0.5 L/ha
Weed spectrum	Sclerotinia, Alternaria
Application time	<ul style="list-style-type: none">• Against Sclerotinia: from the beginning of petal fall• Against Alternaria: in case of infection risk or after 50–60% of flowers have opened



Advantages of Pictor for rapeseed

- Increased resistance to stress
- Effective disease control
- Prevention of pod cracking
- Preserving and obtaining high-quality yield



Sclerotinia disease (white mold)

Pathogen: *Sclerotinia sclerotiorum*



Pictor protects the pods from disease, prevents cracking, and preserves seed quality. Bryansk Region



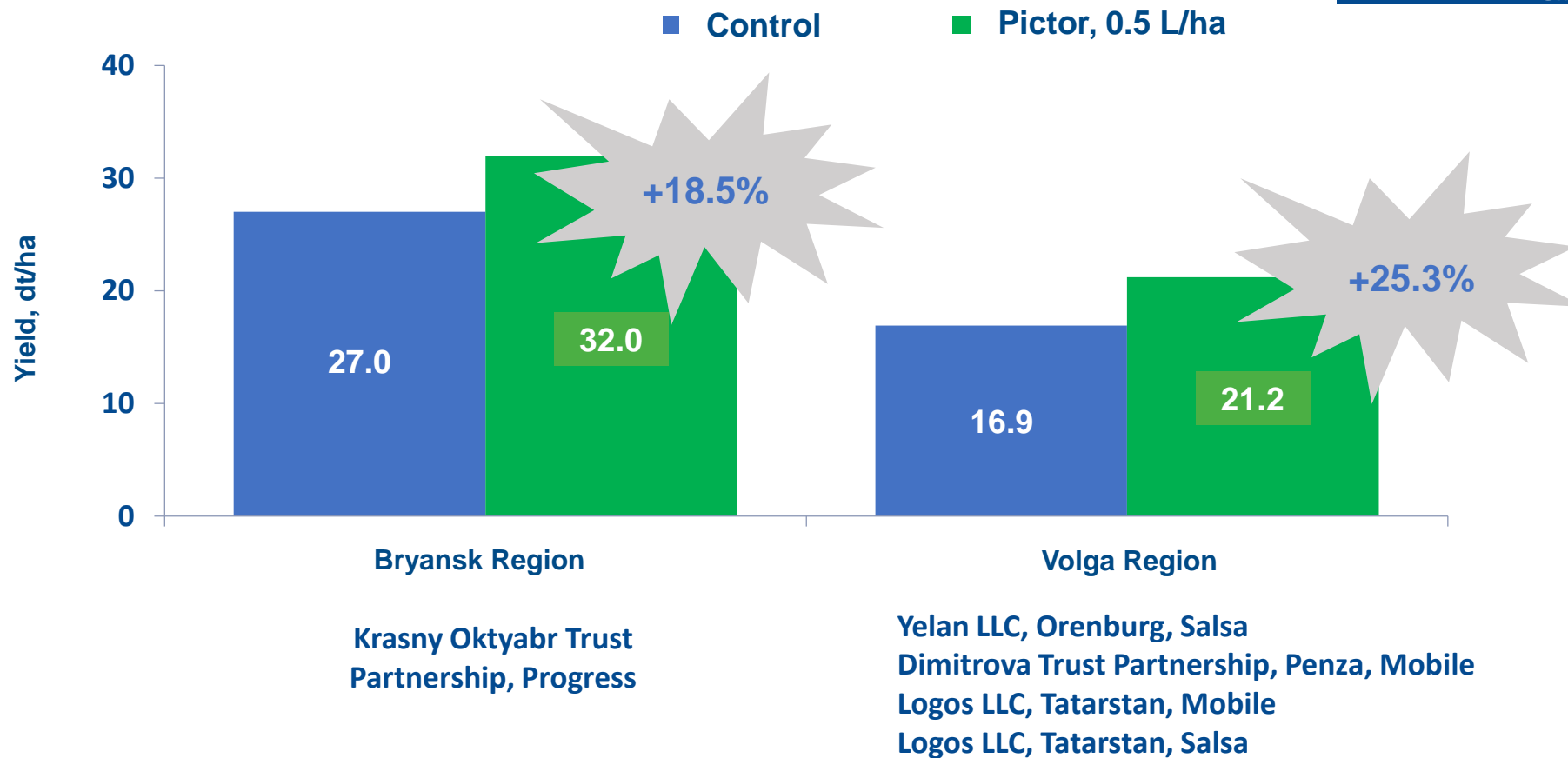
Pictor, 0.5 L/ha



Without herbicide



Average yield increase after application of Pictor fungicide (0.5 L/ha) in different regions of Russia



Rapeseed pests



Crucifer flea beetle

Krasnodar—Ust-Labinsk, winter rapeseed



Crucifer flea beetle

Oryol Region, spring rapeseed



Crucifer flea beetle

Tatrstan, spring rapeseed



Phyllotreta nemorum

Common pollen beetle



Krasnodar Territory, winter rapeseed



Oryol Region, winter rapeseed



Oryol Region, wild radish



Oryol Region, wild radish

Common pollen beetle

Time of infestation and association with application time



Cabbage seedpod weevil

Krasnodar Territory



Brassica pod midge *Dasyneura brassicae*





Economic injury levels (EILs) of rapeseed pests

Pest	Rapeseed development phase	EIL
Crucifer flea beetle	Emerging plants	1–3 beetles per 1 square meter
Diamondback moth	Emerging plants	2–3 caterpillars per plant
Common pollen beetle	At the beginning of budding	1 beetle per plant
	In the middle of budding	1–2 beetles per plant
	At the end of budding	2–3 beetles per plant
Cabbage seedpod weevil	Budding	1 beetle per plant
Cabbage leaf sawfly	Stem formation—budding	2 larvae per 1 square meter, 2 damaged plants per 1 square meter
Brassica pod midge	Flowering	1 female per plant or 20 females per 1 square meter
	Pod development	100 damaged pods per 1 square meter or 6 damaged pods per plant



Thank you!