Program for Cover and Forage Crops

EXPERTS in their field

Mixtures and varieties

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SAATEN UNION
Züchtung ist Zukunft

EXPERTS

… in breeding

The breeding and selection of our cover crops is in the experienced hands of P. H. Petersen Saatzucht in Lundsgaard. The renowned company has been successfully active in plant breeding for decades and has set new standards with the development of nematode-resistant varieties. Together, we offer you a wide range of varieties that are suited to your location and fulfil the highest quality standards. Your advantages:

Diversity: Wide range of plant species for different crop rotations, requirements and cultivation targets

Innovation: Continuous development of new, high-performance varieties and practical solutions through cooperation with research institutes, technical advisory services and innovative farmers.

Quality: Our varieties have top notations for agronomically relevant traits and resistances and are continuously monitored.

Regionality: We offer regionally bred and tested varieties that are specially adapted to your local conditions.

… in counselling

Our experienced sales team is at your side as a competent contact and offers you personalised advice. We analyse your specific requirements and targets and work with you to develop customised, location-specific solutions.

Comprehensive product knowledge: Our employees have in-depth knowledge of our cover crop programme and its possible applications.

Expertise on site: At regional field days organised by us and our partners, you can find out about our catch crops and mixtures in the field.

Information: In addition to catalogues, you will find further and up-to-date information on the products, their applications and useful tools on our website.

… in production and logistics

All steps of seed production are subject to constant quality control. We guarantee that only seed that exceeds the legal standard is delivered in extra quality. Our fast, efficient logistics department ensures quick, uncomplicated delivery.

Seed multiplication: We only use officially tested basic seed material at carefully selected propagation sites. Meticulous propagators and dedicated and experienced supervisors ensure the best possible seed quality and purity from the start.

Cleaning: State-of-the-art, high-performance cleaning systems remove impurities and ensure a high level of seed purity. The efficiant and gentle processing by trained personnel leads to optimum results.

Inspection and certification: In our laboratories, our products are regularly tested for germination capacity, purity and other quality characteristics. Finally they are also officially certified.

Logistics: Good organisation and team work as well as fast and efficient dispatch enable prompt delivery and satisfied customers.

We are convinced that successful agriculture begins in the soil.

With our highly effective cover crop varieties and mixtures, we create the basis for healthy soils and high yields. As your professional and down-to-earth partner for sustainable crop production, we rely on the highest quality and comprehensive expertise along the entire value chain.

P. H. PETERSEN SAATZUCHT LUNDSGAARD

SAATEN UNION
Züchtung ist Zukunft

EXPERTS

- Increased soil fertility
- Better nutrient availability
- Healthy crop rotations
- Climate resilient yields

Contents

EXPERTS in their field

Smart cover cropping is the key to unlocking higher yields and better quality in your main crops, all while ensuring and improving long-term soil fertility. You'll find the many advantages of cover crops that make this happen detailed below, with corresponding symbols throughout this document.

Soil rooting

Intensive root growth from cover crops can break through soil compaction. Furthermore, after mechanical soil cultivation, they can line the loosened soil space with extensive root mass, providing long-term stability. As the roots decompose in the spring, they create air pockets for better aeration and warming. Water absorption capacity is increased, and additional soil structure improvement through freeze-thaw cycles becomes possible.

Different root types complement each other: oilseed radish, faba bean, and lupine develop deep taproots, while saia oat form a root network in the topsoil. This cover crop root activity creates soil aggregate stability and improves the load-bearing capacity of the soil. The radish-forming oilseed radish STINGER is unique in that its strong radish body literally perforates the topsoil.

Current research is intensively investigating the contribution of roots to humus formation, nutrient management, and the promotion of soil biology.

Soil health

With targeted use, cover crops improve field hygiene. By specifically selecting species and varieties tailored to the subsequent crop, disease pressure is reduced, and the health, quality, and yield of the main crop are enhanced. **Continue reading on page 42 ff**

Soil fertility and humus formation

Cover crops deliver additional organic material to your soil as green manure. This means you can make the most of extra sunlight and heat for photosynthesis. In general, one kilo of plant biomass fixes 2 kg of CO_2 and generates 1.5kg of O_2. In the soil, the plant mass feeds soil life and supports the formation of humus.

As well as the amount of biomass from the cover crop, the ratio of carbon to nitrogen in the plant debris is important. Legumes and young plants have a close C/N ratio, so their biomass is easily digestible for soil life. Maturing plants and fast developing species such as early sown white mustard, linseed and saia oat have a higher C/N ratio, so are more resistant to degradation. This effectively contributes to the formation of long-lasting humus. Roots have a different C/N ratio than leaves and stems. So, species with lots of underground biomass (such as oilseed radish and grasses) contribute greatly to lasting humus. The addition of sufficient organic substance is essential for the composition and maintenance of soil fertility, as humus plays a key role in nutrient release, soil structure and the soil's resistance to soil-borne diseases as well as weather damage.

Biological nitrogen synthesis

Thanks to their symbiosis with rhizobia, legumes can fix nitrogen from the atmosphere and use it for plant growth. This means that legumes provide any subsequent crops with additional nitrogen. Properly used, this reduces the need for mineral fertiliser and its energy-intensive production as well as increasing the cover crop blend's N-elasticity. From this year, each viterra® blend will state its N-profit for the subsequent crop. This varies depending on the type of legume and the proportion used in the cover crop blend. **Find out more on page 70.**

Nitrogen conservation

Cover crops can effectively collect nutrients in the autumn, store them in biomass and keep them in the top layer of soil. The nutrients remaining in the soil after harvest and that are mineralised from crop residue may be lost over winter as they are leaching or runnoff with the surface water. Alongside easily displaceable nitrogen, further key nutrients such as potassium, magnesium and sulphur may be washed away with leachate, depending on soil type and pH value.

Some cover crops also have the ability to bind nutrients and making them available for the following main crop. For example, phacelia binds organic phosphorous and buckwheat binds inorganic phosphorous, while linseed mobilises silicon. Some plants enter into symbiosis with fungus to ensure an effective phosphate supply. These mycorrhiza fungi release phosphates from organic compounds, in return using the root exudates (organic carbon compounds) produced by plants. Other cover crops, such as oilseed radish and white mustard, don't need symbiotic fungi as they are able to produce enzymes to digest phosphates (phosphatases) themselves.

When working in green manure in the following spring, the nutrients stored in the cover crops are re-mineralised and can be made available to a main crop such as corn during peak growing season.

Winter-hardy cover crops

Winter-hardy cover crops protect the soil and fix the bound nutrients until spring. The soil organisms are provides with constant nutrition. Depending on the system and cultivation process beeing used, soil protection and biomass production can be combined. The V-Max® mixtures LUNDSGAARDER GEMENGE and WICKROGGEN promote soil biology with theit legume content.

Winter-hardy undersown blends such as viterra® UNTERSAAT GRAS SPÄT or viterra® UNTERSAAT GRAS FRÜH are ideal for regenerative cultivation methods, as they enable facilitate green-in-green cultivation methods to activate and strengthen soil life combined with humus enrichment. In addition, winterhardy cover crops are generally very tolerante to late sowing due to their longlasting growth phase. The viterra® WINTERGRÜN (‚green winter') or viterra® WASSERSCHUTZ (‚water protection') blends are therefore ideal for sensible greening after a late maize harvest (see also EXPERT-TIP page 18).

Frost-sensitive cover crops

Frost-sensitive cover crops can be easily incorporated in the spring and leave optimal conditions for sowing summer crops. Mulch and direct sowing methods are also simpler with frost-sensitive cover crops. Species such as yellow mustard, bristly oats, or phacelia usually die off with light frosts if they were sown in good time. Variety selection also has an influence. For example, the oilseed radish COMPASS is more frost-sensitive than comparable oilseed radish varieties. The oilseed radish CARUSO and the newly approved variety RELAX also die off more easily than other oilseed radish varieties. **Read more on page 18.**

Fodder production

Cover crops offer the possibility to close feed gaps in cattle feeding and to produce additional fresh feed rations. Fodder rape, ryegrasses, legumes, or cereals are suitable for this purpose. When cultivated as a second crop, our V-Max® mixtures can enable two biomass harvests in one year, and harvest periods can be staggered. For reliable planning of on-farm feed production, expected dry matter yields are indicated for all V-Max® blends. **Read more on page 28.**

Promoting soil fauna

A handful of topsoil is home to more soil organisms than there are humans on Earth. Soil life is incredibly diverse in terms of variety and forms. It includes bacteria, fungus, worms, arachnids, countless insects and more. Most of these soil dwellers feed on organic substances, so are the driving force behind all nutrient cycles. They ensure the soil is balanced and retains its buffer capacity. Cover crops contribute to continuously supplying these small beings with sufficient nutrition.

An easily visible example is the earthworm: it takes in plant residue as well as mineral soil elements, sticking them together and excreting highly stable particles.

Earthworm castings contain 5 x more nitrogen, 7 x more phosphorus and 11 x more potassium than the surrounding soil. In „earthworm towers" the clay-humus complexes and earthworm mucus are very visibly effective for soil cohesion. The crumbs are 1 to 5 mm thick and have extreme water resistance.

Safeguarding biodiversity

Cover crops offer the farmer an additional opportunity to expand diversity in subsequent crops. As well as diverse varieties especially developed for particular purposes and conditions, there are also old varieties that are increasingly valued for their benefits. Depending on the subsequent crop, soil type and cultivation period, purposefully greened cover crop fields not only contribute to a high-yield main crop, but also improve soil fertility through managing and encouraging healthy soil life. **Find out more from page 34.**

Production of biomass

Many cover crops produce biomass that can be used in biogas generators. Forage rye (e.g. PROTECTOR and LUNATOR) in particular grows over winter and can be cut in spring (find out more on page 63). Fast-growing blends of summer grains such as V-Max® GRANOLEG and V-Max® GRANOPUR can also be cultivated after early harvested cereals, facilitating another biomass harvest.

Ground cover and erosion control

A dense cover crop layer shades the soil and suppresses weeds. It also offers protection from abiotic stress: the topsoil is protected from overheating, and wind/water erosion is reduced. Cover crops not only take on this role when green, but also protect the ground as a dead mulch layer in preparation for the following main crop and facilitate mulch or direct sowing as well as regenerative farming methods.

Nectar dispenser for honey bees and other insects

Honey and wild bees have great ecological benefits and significance in society. Field greening with flowering cover crops can support bees and other insects by closing any gaps with crop cover. Farmers can have some of their additional expenses reimbursed by programmes to encourage flowered land. People also appreciate flowering species such as phacelia, sunflowers, Persian clover and more, resulting in an image boost for agriculture. **Read more on page 37.**

Habitat and grazing for game

Local big and small game will also benefit from cover crop cultivation. Game cover blends viterra® HORRIDO and viterra® HOCHWILD have been especially designed for this purpose. They offer local wildlife cover, suitable grazing and protection from predators. **Find out more on page 39.**

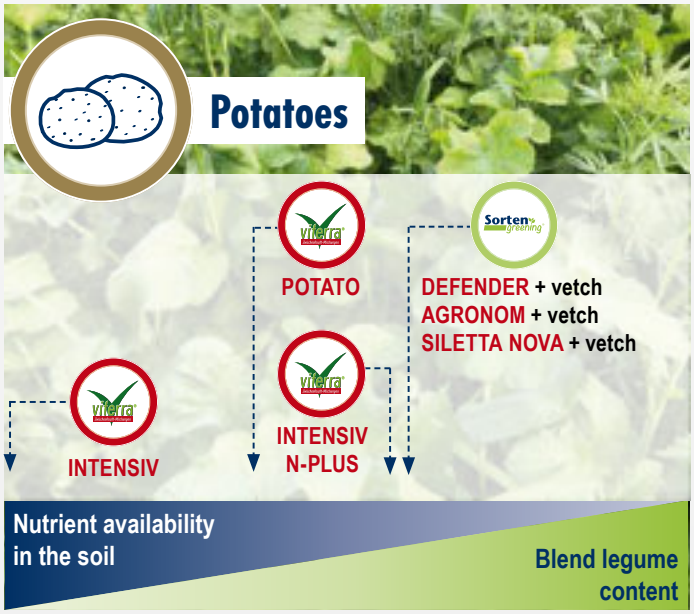
Water retention capacity and rain infiltration

While the addition of organic matter increases the buffering capacities and water retention capacity of the soil in the long term, catch crops also have a very direct preceding crop value. The root penetration of the soil increases the proportion of macropores and mesopores, which improve the soil's ability to absorb rainwater and increase the infiltration rate. As a result, less rainwater runs off the surface unused. During dry periods, the soil can supply moisture for a longer time. Half a percent more humus in the soil corresponds to a weight of approximately 22.5 tons more humus per hectare and thus an increase in water storage capacity of 7 - 11 mm!

Carbon storage and farming

Carbon farming is a term describing agricultural methods that capture atmospheric carbon (CO_2) in the soil. The long-term storage of carbon dioxide (carbon capture and storage) reduces strain on the atmosphere, tackling global climate change. Carbon makes up roughly 50% of the organic material found in soil. An important marker of soil fertility and something that regular cover crop cultivation can aid. **Find out more on page 69**.

EXPERTS for your crop rotation



Recommended blends

The soil should be perfectly prepared before potatoes. The oilseed radish varieties **DEFENDER**, **AGRONOM** and **SILETTA NOVA** tackle various potato diseases and form the ideal base for **SortenGreening®** blends. In combination with vetch, they develop good soil covering in areas with low nitrogen availability.

viterra® POTATO is a rich blend with a focus on soil improvement. **viterra® INTENSIV N-PLUS** with **DEFENDER** oilseed radish, **PRATEX** saia oat and common vetch also grows without additional fertilisation.

Recommended varieties

Multi-resistant oilseed radish

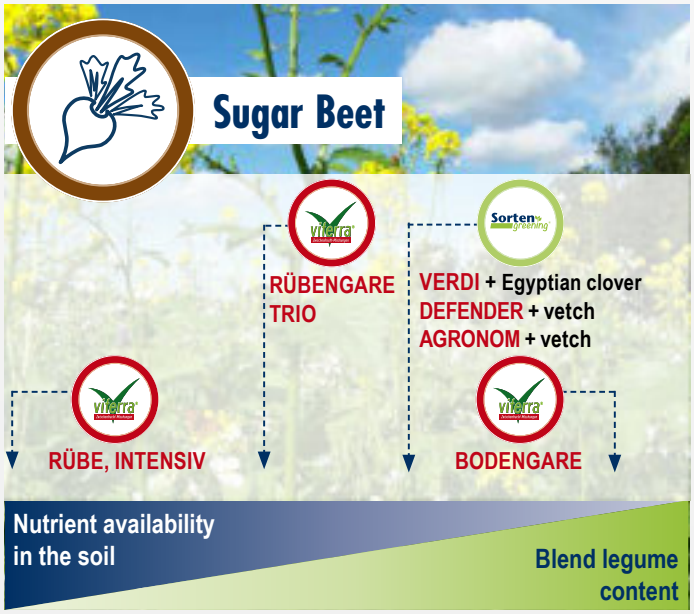
DEFENDER, CONTROL, ANGUS, CARUSO, CONTRA

Oilseed radish against Corky ringspot syndrome

SILETTA NOVA, BENTO, AGRONOM

Oilseed radish SILETINA

Saia oat PRATEX, OTEX, CODEX



Recommended blends

viterra® RÜBE or **SortenGreening® VERDI + Berseem clover** can be used to professionally tackle beet cyst nematodes. If improving soil fertility is a priority, **viterra® RÜBENGARE** and **viterra® TRIO** are ideal blends.

SortenGreening® blends with clover or vetch can be used on fields with low nitrogen availability. **viterra® BODENGARE** not only improves soil, but also generates additional nitrogen for the main crop.

Recommended varieties

Nematode-resistant oilseed radish

Level 1 AMIGO, COMET, PAUL and more

Level 2 DEFENDER, COMPASS, AGRONOM, CARUSO and more

Nematode-resistant white mustard

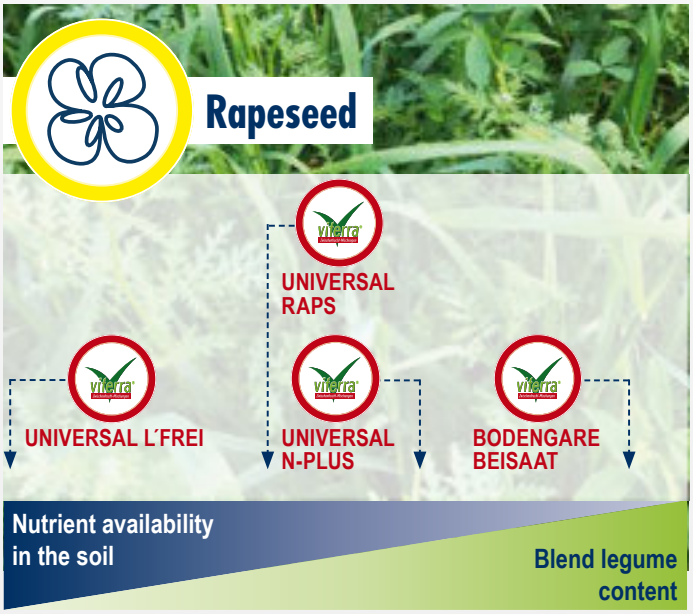
Level 1 NARWAL, VERDI H1

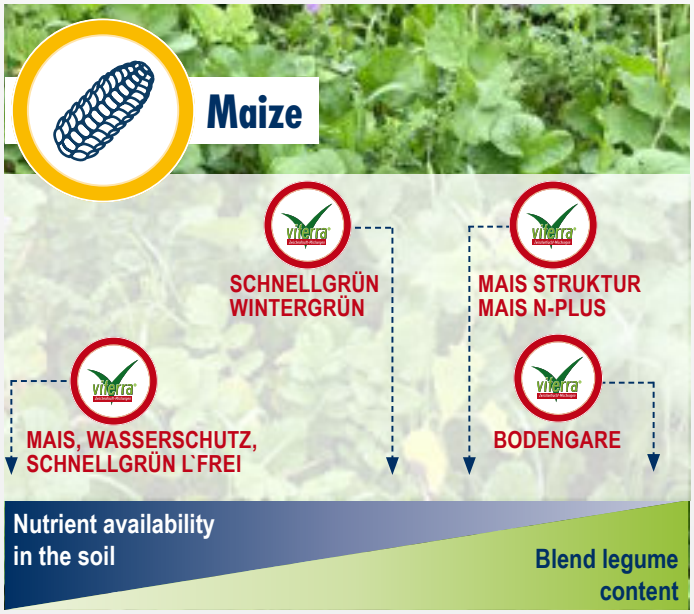
Level 2 SCOUT, TOPAS, ACCENT, PROFI, ABDATE and more

Nematode-neutral

Saia oat PRATEX, OTEX, CODEX

Phacelia ANGELIA





Recommended blends

Crucifer-free blends reduce the risk of rapeseed diseases being spread, improving yield stability. **viterra® UNIVERSAL** and **viterra® RAPS** are tried-and-tested drought-tolerant blends with clover that do not limit fertilisation. For areas that are not fertilised, **viterra® UNIVERSAL N-PLUS** or **viterra® BODENGARE** are beneficial. **viterra® UNIVERSAL LEGUMINOSENFREI** is recommended when the subsequent main crop contains legumes.

viterra® BEISAAT is using the companion crop technology to take the synergistic advantages inherent in mixed cropping.

Recommended blends

viterra® MAIS, **viterra® MULCH** and **viterra® WASSERSCHUTZ** are suitable for agriculture on sites with high nitrogen replenishment potential. Thanks to a high legume content, winter-hardy blend **viterra® MAIS STRUKTUR** and freezing-off blend **viterra® BODENGARE** both encourage soil fertility.

viterra® SCHNELLGRÜN, viterra® SCHNELLGRÜN LEGUMINOSENFREI, viterra® WASSERSCHUTZ and **viterra® WINTERGRÜN** are especially well suited to late sowing.

Recommended varieties

Phacelia ANGELIA

Saia oat PRATEX, CODEX, OTEX

Ryegrass ALISCA, DIPLOMAT

Rye PROTECTOR, LUNATOR and more

Linseed JULIET, ZOLTAN

Persian clover FELIX

Berseem clover OTTO

Broad bean AVALON

Recommended varieties

White mustard ALBATROS, CLASSIC, COVER

Oilseed radish SILETINA

Taproot-forming oilseed radish STINGER

Forage rape JUMBO 00, FONTAN 00

Winter turnip rape JUPITER

Phacelia ANGELIA

Saia oat PRATEX, OTEX, CODEX

Ryegrass ALISCA, DIPLOMAT

Rye PROTECTOR, LUNATOR and more

EXPERTS at a glance

viterra® Soil fertility blends

Soil fertility blends

Blend	Special feature	Suitable for crop rotation with: Maize	Cereals	Rapeseed	Sugar Beet	Potatoes	Legumes	Contents as abbreviations	Seed quantity kg/ha	Scattering ability	Sowing window: April	May	June	July	August	September	October	Legume proportion, seed %	Legume proportion, weight %	Page
INTENSIV	The health blend	+	+	+	++	++	+	HS, OR	40-50	–								0	0	13
INTENSIV N-PLUS	The flexible potato trio	++	+	+	++	++		OR, HS, WIS	50-60	–								24	54	13
POTATO	The versatile boost for potatoes	+	+	+	+	++		OR, HS, WIS, LN, LUB	50-60	+								24	69	14
RÜBENGARE	The diverse beet blend	+	+		++			PHA, AKL, HS, SF, WIS, EF	30	–								27	67	15
RÜBE	Professional againt nematodes	+	+		++		+	OR, SF	20-25	+								0	0	15
TRIO	The frost-sensitive blend with clover	+	+	+	++			PHA, AKL, OR	15-18	+								24	14	16
MAIS STRUKTUR	Diversity and structure for stressed soils	++	+					ASF, PHA, PKL, WKL, IKL, HS, OR, RAW, WIW, LUB, SWE, SOL	25-30	–								49	46	17
MAIS N-PLUS	Booster for soil structure and nutrients	++	+					PHA, AKL,OR,LN, HS, WIS, HI, EF,SOL	30-35	–								30	62	17
MAIS	Fast growing blend without legumes	++	+				+	PHA, OR, HS, LN, HI, SBL	20	–								0	0	18
SCHNELLGRÜN	Suitable for late sowing, with clover	++	+					SF, MKL, LND, SFB	12-15	+								21	6	19
SCHNELLGRÜN LEGUMINOSENFREI	Suitable for late sowing, without legumes	++	+				++	LND, SF, SFB, LN	12-15	+								0	0	19
WINTERGRÜN	Extremely tolerante for late sowing and winter-hardy	++	++					RUW, IKL, RAW	12	+								28	29	20
WASSERSCHUTZ	For effective groundwater protection	++	++				+	RAW, RUW, KOF	10-12	+								0	0	20
UNIVERSAL	Cruciferiuos-free and drought tolerant	+	+	++	+			PHA, HS, MKL, AKL, PKL	25	–								27	5	21
UNIVERSAL LEGUMINOSENFREI	Cruciferous-free and legume-free	+	+	++	+		++	PHA, HS, LN, HI	25	–								0	0	21
UNIVERSAL N-PLUS	Cruciferous-free and nitrogen-fixing	+	+	++	+			PHA, HS, WIS, MKL, PKL, AKL, EF	35-40	+								29	56	22
RAPS	Winter-killed and crucifer-ous-free	+	++	++	+			PHA, LN, MKL, PKL, AKL	15	–								28	12	22
BODENGARE	A powerhouse for main crops	++	++	++	+			PHA, PKL, MKL, AKL, HI, WIS, EF, LUB, BA, SOL	45-50	–								64	89	23
HÜLSENFRUCHT-GEMENGE	The nitrogen supplier	++	++	++	++			WIS, EF, BA	120-150	–								100	100	23

SortenGreening®

SortenGreening®

Blend	Suitable for crop rotation with: Maize	Cereals	Rapeseed	Sugar Beet	Potatoes	Legumes	Contents as abbreviations	Seed quantity kg/ha	Scattering ability	Sowing window: April	May	June	July	August	September	October	Legume proportion, seed %	Legume proportion, weight %	Page
VERDI + berseem clover	++	++		++			SF, AKL	12-15	+								21	10	24
DEFENDER + common vetch	++	++	+	++	++		OR, WIS	50-60	+								29	67	24
AGRONOM + common vetch	++	++	+	++	++		OR, WIS	50-60	+								30	67	24
SILETTA NOVA + common vetch	++	++	+		++		OR, WIS	50-60	+								30	69	24

viterra® Special blends

Special blends

Blend	Special feature	Suitable for crop rotation with: Maize	Cereals	Rapeseed	Sugar Beet	Potatoes	Legumes	Contents as abbreviations	Seed quantity kg/ha	Scattering ability	Sowing window: April	May	June	July	August	September	October	Legume proportion, seed %	Legume proportion, weight %	Page
UNTERSAAT KLEE PLUS	Clover undersowing for cereals or rotanional fallow	++	++	++	+			WD, WKL	15	+	depending on the main crop							29	7	26
BEISAAT FEIN	Intersowing for high-yield rapeseed cultivation		+	++				AKL, PKL, BHK, MKL	8-10	+	depending on the main crop							100	100	27
BEISAAT GROB	Intersowing for high-yield rapeseed cultivation		+	++				BA, LUB	35	+	depending on the main crop							100	100	27
UNTERSAAT GRAS FRÜH	Well-thought-out strategy for integ-rating beneficial blend into maize	++						ROT, WSC	8-10	+	depending on the main crop							0	0	27
UNTERSAAT GRAS SPÄT	Well-thought-out strategy for integ-rating beneficial blend into maize	++						WV, WD	10-15	+	depending on the main crop							0	0	27

AKL Trifolium alexandrinum, ASF Brassica carinata, BA Vicia faba, BHK Trigonella foenum-graecum, BOR Borago officinalis, BUW Fagopyrum, DIL Anethum graveolens, EF Pisum sativum, ESP Onobricychis viciifolia, HA Avena sativa, HI Sorghum, HS Avena strigosa, IKL Trifolium incarnatum, KOF Brassica oleracea acephala, LN Linum usitatissimum, LUB Lupinus angustifolius, LND Camelina sativa, LUZ Medicago sativa, MKL Trifolium michelianum, OR Raphanus sativus conv oleiformis, PHA Phacelia tanaceltifolia, PKL Trifolium resupinatum, RAS Brassica napus spring, RAW Brassica napus winter, Sommerfutterraps, RBL Ringelblume, RKL Rotklee, ROT Rotschwingel, RS Sommerroggen, RUW Winterrübsen, RW Secale cereale winter, SD Ornithopus sativus, SFB Brassica juncea, SF Sinapis alba, SOL Helianthus annuus, SWE Plantago lanceolata, TIS Triticosecale spring, TIW Triticosecale winter, WB Lolium hybridum, WD Lolium perenne, WEI Lolium multiflorum, WIP Vicia pannonica, WIS Vicia sativa, WIW Vicia villosa, WKL Trifolium repens, WSC Poa pratensis, WSR Secale multicaule, WV Lolium multiflorum (italian)

V-Max® Biomass blends

Blend	Special feature	Suitable for crop rotation with: Maize	Cereals	Rapeseed	Sugar Beet	Potatoes	Legumes	Contents as abbreviations	Seed quantity kg/ha	Scattering ability	Sowing window: March	April	May	June	July	August	September	October	Legume proportion, seed %	Legume proportion, weight %	Page
V-Max® Biomass blends																					
LUNDSGAADER GEMENGE	Winter-hardy blend for fodder and soil fertility	++	++	++	+			WV, IKL, WIW, EF	50	–									48	71	28
GRANOPUR	WPS use before winter	++	++	+	+	++	+	TIS, HA, HS, RS	130-150	–									0	0	29
GRANOLEG	WPS use before winter	++	++	+	+			TIS, HA, RS, EF, HS	130-150	–									4	25	29
WICKROGGEN	Winter-hardy WPS blend	++	+	+	+			RW, WIW, WIP	100-120	–									9	10	29
WICKROGGEN FUTTER	Winter-hardy WPS blend	++	+	+	+			RW, WIW, WV	110	–									4	10	29
ERBSENTRITICALE	Winter-hardy blend for WPS or grain use	++	+	++	+			TIW, EF	150-170	–									12	23	30
SOMMERFUTTER	Fodder blend, provide fodder within the same year	++	++	++	+			PKL, WEI, WV	25-30	–									46	28	30
SOMMERFUTTER A2	Fodder blend, provide fodder within the same year	++	++	++	+		+	WV, WEI	40-45	–									0	0	30
FUTTER	Grass-clover blend for harvesting	++	++	+	+	+		WV, IKL	30-40	–									48	51	31
KLEEGRAS	Clover blend for perennial cultivation	++	++	++	+			WV, WB, WD, RKL, WKL	30-35	–									68	37	31

Organic blends

Blend	Special feature	Suitable for crop rotation with: Maize	Cereals	Rapeseed	Sugar Beet	Potatoes	Legumes	Contents as abbreviations	Seed quantity kg/ha	Sowing window: April	May	June	July	August	September	October	Page
V-Max® Öko-Mischungen																	
LUNDSGAARDER GEMENGE ÖKO	Winter-hardy blend for fodder and soil fertility	++	++	++	+			WV, IKL, WIW, EF	50								28
WICKROGGEN ÖKO	Winter-hardy WPS blend	++	+	+	+			RW, WIW	100 - 120								29
WICKROGGEN FUTTER ÖKO	Winter-hardy WPS blend and fodder use	++	+	+	+			RW, WV, IKL, WIW	100 - 120								29
ERBSENTRITICALE ÖKO	Winter-hardy blend for WPS or grain use	++	+	+	+			TIW, EF	150 - 170								30
KLEEGRAS ÖKO	Clover blend for perennial cultivation	++	++	++	+			WD, WB, RKL, WV, WKL	40								31
viterra® Öko-Mischungen																	
INTENSIV ÖKO	The health blend	+	+	+	++	++	+	HS, OR	40 - 50								13
POTATO ÖKO	The versatile boost for potatoes	+	+	+		++		WIS, LUB, OR, HS	50 - 60								32
DEPOT ÖKO	The nutrient reservoir	++	++				++	HS, OR, SF, PHA, SOL	20								33
SPRINT ÖKO LIGHT	The quick starter	++	++				++	BUW, SF, PHA	15								33
BODENGARE ÖKO	A powerhouse for main crops	++	+	++	+			BA, EF, WIS, LUB, AKL, PHA, SOL	60 - 70								32

viterra® Nature and environment blends

Blend	Special feature	Suitable for crop rotation with: Maize	Cereals	Rapeseed	Sugar Beet	Potatoes	Legumes	Contents as abbreviations	Seed quantity kg/ha	Scattering ability	Sowing window: March	April	May	June	July	August	September	October	Legume proportion, seed %	Legume proportion, weight %	Page
Nature and environment blends																					
PUFFERSTREIFEN	Ideal for protection of waterside and ditches	For fallow land						WSC, ROT, WKL	15 - 25	–									27	13	36
DAUERBRACHE	Bi-annual, biodiverse, ecological greening of fallow areas	For fallow land						WKL, IKL, RKL, LUZ, ESP, SD, WSC, ROT	15 - 20	–									80	88	35
ROTATIONSBRACHE	Perennial and drought resistant	For fallow land						IKL, LUZ, LN, WSR, PHA, BHK, WIW	25	–									56	44	35
BIENE	Without cruciferous plants, grasses and buckwheat	For fallow land						AKL, PKL, PHA, DIL, LUZ, SD, WIS, RBL, EF, LUB, SOL, MKL	25	–									75	84	37
NRW BUNTE BRACHE	Perennial and colourful	For fallow land						RKL, WKL, LUZ, PHA, WSR, LN, IKL, BUW, ESP, RAW, LUB, SBL, WSC, HA	20 - 25	–									67	54	36
BIENE ECO	Flowering blend with tolerance to cold temperatures	++	+	++				WKL, PHA, RKL, DIL, LUZ, ESP, BUW, RBL, ZS, MAL, SOL, BOR,	12,5 - 15	–									54	34	37
BIENE ECO 2.1	Flowering blend with high biodiversity	++	+					PHA, LN, DIL, RBL, BOR, BUW, SOL, KRE, OR, LUZ, FEN, STKw, RKL, WKL	15 - 20	–									26	7	37
MULTIKULTI	Annual flowering blend with multiple positive effects	++	+		++			AKL, PKL, OR, SF, SD, WIS, LUB, EF, PHA, SOL, BOR, BUW	25	–									40	58	38
BLÜHZAUBER	The annual flowering meadow	Not recommende for arable farming						Over 40 flowering species	5 - 7 g/m²	–									-	-	38
BLUMENTEPPICH	Perennial flowering blend	Not recommende for arable farming						Over 30 flowering annuals and perennials	5 - 7 g/m²	–									-	-	38
HORRIDO	Biennial wildflower blend	+	+					WSR, BUW, HS, SD, SOL, WIW, AKL, PKL, MAL, RAW, LN, RKL, LUZ, PHA, OR, RUW, KOF, MKL	25 - 30	–									58	20	39
HOCHWILD	Two-years wild blend without crucifers	++	++	++				MKL, RKL, LUZ, AKL, IKL, EF, LUB	25	–									100	100	39
NIEDERWILD	Biennial, versatile, without cruciferous plants	+	+					BUW, WSR, SOL, LN, ESP, LUB, LUZ, PHA, RKL, WKL, MAL, HKL, GKL	25	–									71	31	39

The percentages of the individual components in the blends may vary slightly due to different TKWs. If unavailable, varieties can be substituted with equivalent varieties.

viterra
Green Manure Blend

EXPERTS

viterra® soil fertility blends contribute to humus formation and improve soil fertility. Blend partners with various root types allow deep soil penetration by the roots, offering protection from erosion. Nitrogen and other nutrients are fixed over winter and remain available in the top layers near the roots. Additional organic mass also stimulates and encourages soil life.

Our soil fertility blends can do more: tailored to the subsequent crop, they are an important component in disrupting diseases in the main crop. All of these features lead to an increase in the main crop's quality and yield.

The blend **viterra® WINTERGRÜN** is a new addition to the range, and is ideal for late sowing, e.g. after silage maize, thanks to rapid initial development of winter turnip rape and winter forage rape.

All **viterra® soil fertility blends** are ideally suited to meeting requirements to restore nature and force biodiversity.

EXPERT-TIP: Cultivation according to nutrient availability

In addition to their impact on the following crop, the choice of a cover crop depends crucially on the nitrogen and nutrient level in the field. We classified our cover crop blends in three groups:

Fertilisation recommended: These mixtures should be fertilised with 60 kg N_{tot}/ha (max. 30 kg NH_4-N/ha) or more, depending on national law.

N-flexible: Blends contain a small proportion of legumes or mainly clover: this makes them flexible in terms of fertilisation, as they could feed themselves and reward additional fertilisation with better growth.

Fertilisation not necessary: These blends contain sufficient high-quality legumes for their growth and are ideal for areas without additional fertilization.

follow-up \ N-availability	Fertilisation recommended	N-flexible	Fertilisation not necessary
Potato	viterra® INTENSIV		viterra® INTENSIV N-PLUS viterra® POTATO SortenGreening® DEFENDER & WIS SortenGreening® AGRONOM & WIS SortenGreening® SILETTA NOVA & WIS
Sugar Beet	viterra® RÜBE	viterra® TRIO SortenGreening® VERDI & AKL	viterra® RÜBENGARE
Rapeseed	viterra® UNIVERSAL LEGUMINOSENFREI	viterra® UNIVERSAL viterra® RAPS	viterra® UNIVERSAL N-PLUS
Maize	viterra® MAIS	viterra® MAIS N-PLUS	viterra® MAIS STRUKTUR

viterra® INTENSIV

The health blend

- Reduces Root lesion nematodes (*Pratylenchus*) and Corky ringspot syndrome in potatoes
- Fast-growing with intensive weed suppression and high nutrient absorbency before winter
- The fibrous roots of PRATEX and the taproots of multi-resistant DEFENDER complement each other to achieve root penetration of the entire soil
- **EXPERT-TIP**: Ideal preceding crop before grain legumes to reduce the root lesion nematodes and PEBV

Sowing
Mid July to early September

Sowing density
40 - 50 kg/ha

Legume proportion:
0 seed % / 0 weight %

Packaging unit:
25kg paper sack or 500kg BigBag

Fertilisation	
Recommended	✗
N-flexible	
Not required	

Suitable for subsequent crop	
Maize	✗
Cereals	✗
Rapeseed	✗
Sugar beet	✗✗
Potatoes	✗✗
Legumes	✗✗

viterra® INTENSIV seed proportions:

54 % saia oat PRATEX, 46 % multi-resistant oilseed radish DEFENDER

viterra® INTENSIV N-PLUS

The N-flexible potato trio

- High level of flexibility regarding nutrient availability through common vetch's atmospheric nitrogen fixing
- Reduces Corky ringspot syndrome in potatoes
- Fast-growing with intensive weed suppression
- **Tip:** Moderate legume content of < 30 seed percentage allows use within voluntary agreements (e.g. water conservation)

Sowing
Mid July to early September

Sowing density
50 - 60 kg/ha

Legume proportion:
23 seed % / 52 weight %

Packaging unit:
25kg paper sack or 500kg BigBag

Fertilisation	
Recommended	
N-flexible	
Not required	✗

Suitable for subsequent crop	
Maize	✗✗
Cereals	✗
Rapeseed	✗
Sugar beet	✗✗
Potatoes	✗✗
Legumes	

viterra® INTENSIV N-PLUS seed proportions:

49% multi-resistant oilseed radish DEFENDER
23% common vetch NEON/ARGON
28% saia oat PRATEX

viterra® POTATO

The versatile boost for potatoes

- Substantial blend to improve soil and enrich humus in potato and sugar beet crop rotations
- Also suitable for sites with low nitrogen availability thanks to legume content
- Blue lupin ILDIGO and multi-resistant oilseed radish CONTROL penetrate large volumes of soil rapidly with their deep roots, improving the structure of the soil

Sowing
Mid July to mid August

Sowing density
50 - 60 kg/ha

Legume proportion:
24 seed % / 66 weight %

Packaging unit:
25kg paper sack or 500kg BigBag

Fertilisation	
Recommended	
N-flexible	
Not required	✗

Suitable for subsequent crop	
Maize	✗
Cereals	✗
Rapeseed	✗
Sugar beet	✗
Potatoes	✗✗
Legumes	

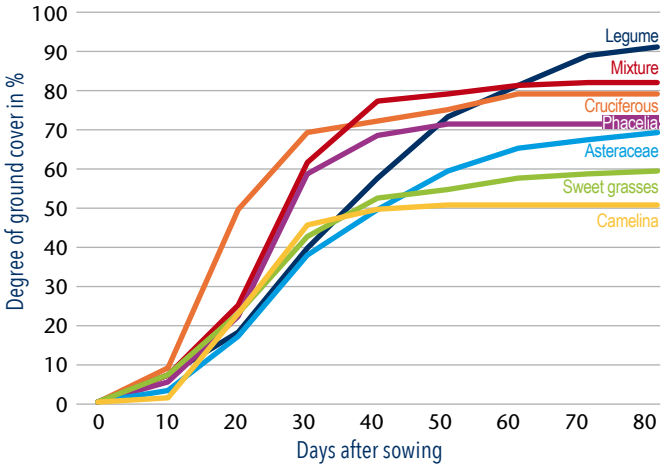
viterra® POTATO seed proportions:

48% oilseed radish CONTROL,
20% saia oat PRATEX,
17% common vetch NEON/ARGON,
8% linseed JULIET,
7% blue lupin ILDIGO

EXPERT-TIP: Initial development and ground cover

Fast and comprehensive ground cover is essential for the good establishment of cover crops. In addition to farming methods (from page 67) and the cultivation period (see sowing tables), the type of cover crop and the choice of variety are very important.

Ground cover of various cover crop types



- **Cruciferous plants**: very rapid initial development
- **Legumes**: broad leaves for complete shading
- **Saia oats**: dense ground cover after dying back
- **Blends** ensures stability in weed suppression and combines good properties

Source: modified according to Wittwer et al (2015)

Rapid initial development is important,

- so that weeds and volunteer cereals can be effectively suppressed.
- so that rooting is quickly and intensively and thus more root space can be utilised to promote soil health (and nematode control).
- so that more biomass can be formed. Root growth in particular activates and nourishes the soil biology, making a significant contribution to humus formation and thus to the buffering capacity of the soil.

There are also major differences in the initial development of varieties:

With very good to good initial development, oilseed **AGRONOM** is fast in ground cover and therefore an EXPERT for weed suppression and rooting.

viterra® RÜBENGARE

The diverse beet blend

- No multiplication of beet cyst nematodes and wellstructured soil
- This diverse, insect-friendly blend offers optimal root penetration through the topsoil, leaving fertile soil for sugar beet mulch sowing
- Reliably freezes off so that dead plant matter protects soil from wind and water erosion over winter
- Also suitable for sites with low nitrogen availability

Sowing
July to late August

Sowing density
30kg/ha

Legume proportion:
24 seed % / 66 weight %

Packaging unit:
25kg paper sack or 500kg BigBag

Fertilisation	
Recommended	
N-flexible	
Not required	✗

Suitable for subsequent crop	
Maize	✗
Cereals	✗
Rapeseed	
Sugar beet	✗✗
Potatoes	
Legumes	

viterra® RÜBENGARE seed proportions:

45% phacelia ANGELIA
15% berseem clover OTTO
14% saia oat PRATEX
14% white mustard VERDI
9% common vetch NEON/ARGON
3% spring field pea RUBIN

viterra® RÜBE

Professional against nematodes

- High-performance blend of two nematode-resistant oilseed radishes (AMIGO and COMPASS) and white mustards (VERDI and MASTER) for improved crop reliability and optimal control success
- A sufficient plant density of over 160 plants/m² allows active nematode control at the highest level
- Oilseed radish roots penetrate deep into the lower layers of soil to reduce nematodes even deep down
- **TIP:** Due to good flight characteristics viterra® RÜBE is excellently suited for drone seeding. Early sowing is helpful for controlling BCN: More time and deeper rooting.

Sowing
Mid July to early September

Sowing density
20 - 25 kg/ha

Legume proportion:
0%

Packaging unit:
25kg paper sack or 500kg BigBag

Fertilisation	
Recommended	✗
N-flexible	
Not required	

Suitable for subsequent crop	
Maize	✗
Cereals	✗
Rapeseed	✗✗
Sugar beet	
Potatoes	
Legumes	✗

viterra® RÜBE seed proportions:

28 % nematode-resistant oilseed radish COMPASS
24% nematode-resistant oilseed radish AMIGO
24% nematode-resistant white mustard VERDI
24% nematode-resistant white mustard MASTER

viterra® TRIO

The frost-sensitive blend with clover

- Freezing off easily, oilseed radish COMPASS, phacelia and Berseem clover leave behind a fine-stemmed mulch layer for optimal erosion protection until spring sowing
- No multiplication of beet cyst nematodes
- Fast initial development and dense soil penetration with thick and thin roots
- Bees and insects use the late phacelia flowers

Sowing
Early-mid July to mid August

Sowing density
15 - 18 kg/ha

Legume proportion:
24 seed % / 16 weight %

Packaging unit:
25kg paper sack or 500kg BigBag

Fertilisation	
Recommended	
N-flexible	✗
Not required	

Suitable for subsequent crop	
Maize	✗
Cereals	✗
Rapeseed	✗
Sugar beet	✗✗
Potatoes	
Legumes	

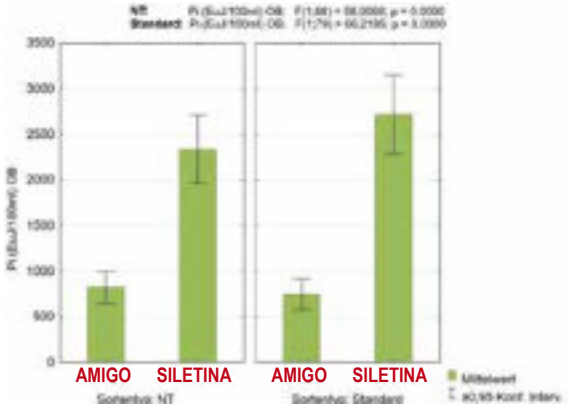
viterra® TRIO seed proportions:
52% phacelia ANGELIA
24% berseem clover OTTO
24 % nematode-resistant oilseed radish COMPASS

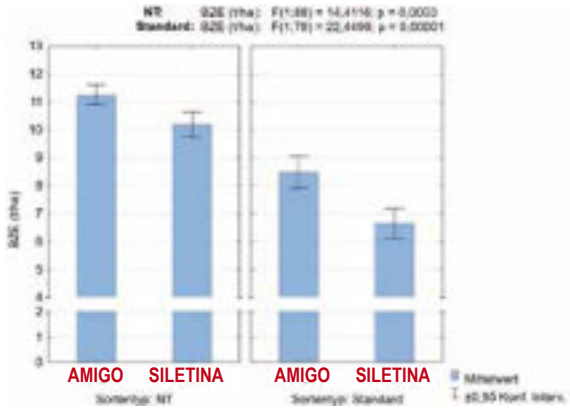
EXPERT TIP: Cover crops for sugar beets

The use of resistant cover crops in the sugar beet crop rotation remains an important tool for healthy and high-yielding sugar beets. However, the term ‚resistant' refers exclusively to the effect against the beet cyst nematode (*Heterodera schachtii*). A reduction in beet cyst nematodes is accompanied by a yield stabilization of sugar beet yields. This is true not only for standard varieties but also for nematode-tolerant (NT) sugar beet varieties!

Resistant cover crops secure yield Field trial 2021

(AMIGO BSA level 1; SILETINA susceptible) Source: Dr Matthias Daub, JKI Elsdorf





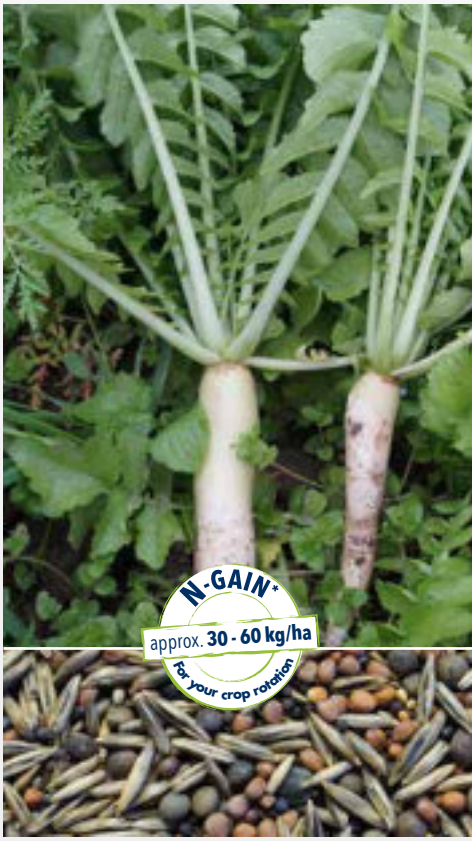
For optimal control, it is important that sufficient soil penetration occurs so that the nematodes are stimulated to hatch. This is achieved with a sufficient number of resistant plants, good initial development, and the exclusion of potential host plants.

The stem nematode (*Ditylenchus dipsaci*) occurs in some areas mixed together with BCN. In these regions, white mustard should not be grown as a cover crop; instead, oilseed radish should be consistently used as a cover crop. In these double infested areas, the cultivation of peas, field beans, and clover should also be avoided.

viterra® MAIS STRUKTUR

Diversity and structure for stressed soils

- Long-lasting soil protection and nutrient storage through approximately 60% winter-hardy components
- The enormous taproot of STINGER tillage radish increases infiltration capacity
- Intensive soil loosening through broad and deep-rooting plants.
- High-quality legumes such as winter vetch, lupine, and clover introduce new nitrogen into the crop rotation, suitable for locations with low nitrogen availability.
- **NEW:** with nitrification-inhibiting ribwort plantain and high biomass producing Abyssinian kale.



Sowing
Mid July to late August

Sowing density
25 - 30 kg/ha

Legume proportion:
46 seed %, 47 weight %

Packaging unit:
25kg paper sack or 500kg BigBag

Fertilisation	
Recommended	
N-flexible	
Not required	✗

Suitable for subsequent crop	
Maize	✗✗
Cereals	✗
Rapeseed	
Sugar beet	
Potatoes	
Legumes	

viterra® MAIS STRUKTUR seed proportions:

31% white clover	8% saia oat PRATEX	2% persian clover FELIX
22% phacelia ANGELIA	4% abyssinian kale ABEBA	2% winter vetch BELLA
13% crimson clover	4% tillage radish STINGER	1% blue bitter lupine ILDIGO
9% winter forage FONTAN 00	3% ribwort plantain	< 1% sunflower

viterra® MAIS N-PLUS

Booster for soil structure and nutrients

- Optimum combination of different root types for intensive soil rooting, even in deeper layers.
- Good ground cover and shading to promote soil structure and protect soil fauna, thus increasing soil fertility
- Not winter-hardy: maize sowing is possible in spring with minimum tillage
- Saia oats and sorghum provide sugar components to enhance mycorrhizal fungi

Sowing
Mid-July to the end of August

Sowing density
30 - 35 kg/ha

Legume proportion:
30 seed %, 62 weight %

Packaging unit:
25kg paper sack or 500kg BigBag

Fertilisation	
Recommended	
N-flexible	✗
Not required	

Suitable for subsequent crop	
Maize	✗✗
Cereals	✗
Rapeseed	
Sugar beet	
Potatoes	
Legumes	

viterra® MAIS N-PLUS seed proportions:

30 % phacelia ANGELIA	9 % saia oat PRATEX	<1 % sunflower
19 % berseem clover OTTO	7 % common vetch ARGON/NEON	
13 % oilseed radish INFORMER	6 % sorghum	
12 % linseed JULIET	3 % forage pea	

viterra® MAIS

Fast-growing blend without legumes

- Fast ground cover with vigorously growing components
- Good processor of slurry and other nutrients, excellent erosion and water protection
- Combination of deep and flat roots for thorough root penetration, stabilisation of soil structure and rapid root penetration in maize crops
- Saia oat promotes mycorrhizal fungi to stabilise soil structure

Sowing
Mid July to late August

Sowing density
20kg/ha

Legume proportion:
0%

Packaging unit:
25kg paper sack or 500kg BigBag

Fertilisation	
Recommended	✗
N-flexible	
Not required	

Suitable for subsequent crop	
Maize	✗✗
Cereals	✗
Rapeseed	
Sugar beet	
Potatoes	
Legumes	✗

viterra® MAIS seed proportions:

36% phacelia ANGELIA
30% oilseed radish SILETINA
18% saia oat PRATEX
9% linseed Juliet
5% sorghum
<1% sunflower

EXPERT TIP: Winter hardiness of cover crops

The winter hardiness of cover crops influences the soil covering over winter, nutrient uptake and mineralisation in spring, as well as the promotion of microorganisms and the technique to terminate the cover crop. The time of sowing and the nutritional status of the plants also have an influence on winter hardiness: as a rule, cover crops are more tolerant of cold temperatures in the bginning growing stages and after periods of stress.

In °C	Cover crop type
+1	Niger, sorghum, millet, buckwheat, sunflowers
0	
-1	Cress, dill, saia oat, summer turnips
-3	White mustard, Brown mustard, phacelia (sown early), common vetch, eruca, summer peas, persian clover, berseem clover, linseed
-5	Camelina, tillage radish, annual ryegrass, oilseed radish (early flowering)
-7	Phacelia (late sown), oats
-9	Oilseed radish (late sown)
-13	Vicia villosa, winter vetches, winter forage rape, crimson clover
-15	Italian ryegrass, forage rye, perennial forest rye

Cold sensitivity of cover crop species

viterra® SCHNELLGRÜN

Suitable for late sowing, with clover

- Fast greening and good tolerance to late sowing thanks to especially voracious growers, white mustard ALBATROS and brown mustard ENERGY
- The blend's name reveals its particular advantage: ‚Schnellgrün', which translates to ‚SPEEDYGREEN'."
- Non-hardy varieties make mulch sowing the following crop much easier in spring
- **Tip**: Low demands on the seedbed and scatter capability make for cheap and easy sowing

Sowing
Early August to mid-late September

Sowing density
12 - 15 kg/ha

Legume proportion:
21 seed % / 6 weight %

Packaging unit:
25kg paper sack or 500kg BigBag

Fertilisation	
Recommended	
N-flexible	X
Not required	

Suitable for subsequent crop	
Maize	XX
Cereals	X
Rapeseed	
Sugar beet	
Potatoes	
Legumes	

viterra® SCHNELLGRÜN seed proportions:

38 % white mustard ALBATROS
21 % balansa clover
21 % camelina
20 % brown mustard ENERGY

viterra® SCHNELLGRÜN LEGUMINOSENFREI

Suitable for late sowing, without legumes

- Good convertor of slurry and other nutrients
- Fast greening and good tolerance to late sowing thanks to especially voracious growers, white mustard ALBATROS and brown mustard ENERGY
- Low demands on the seedbed and scatter capability make for cheap and easy sowing
- **Tip:** Ideal before maize and also suitable as a cover crop after early maize harvests
- **EXPERT tip**: viterra® SCHNELLGRÜN LEGUMINOSENFREI well-suited as a preceding crop before grain legumes, as it breaks disease cycles and improves soil healths

Sowing
Early August to mid-late September

Sowing density
12 - 15 kg/ha

Legume proportion:
0%

Packaging unit:
25kg paper sack or 500kg BigBag

Fertilisation	
Recommended	X
N-flexible	
Not required	

Suitable for subsequent crop	
Maize	XX
Cereals	X
Rapeseed	
Sugar beet	
Potatoes	
Legumes	X

viterra® SCHNELLGRÜN LEGUMINOSENFREI seed proportions:

37 % camelina
25 % white mustard ALBATROS
23 % brown mustard ENERGY
15 % linseed ZOLTAN

viterra® WINTERGRÜN

Extremely tolerant of late sowing and winter-hardy

- Translation of the name: winter green
- Rapid greening and good tolerance for late sowing due to the particularly fast-growing winter forage rape EMERALD and the robust winter turnip rape JUPITER
- Winter-hardy blend stores nutrients until spring, covers the soil, and effectively suppresses weeds
- Spreadable components enable easy and cost-effective sowing, very well-suited for drone seeding
- Crimson clover offers nitrogen flexibility throughout the entire cultivation period and starts flowering early in spring

Sowing
Mid July to late September

Sowing density
12kg/ha

Legume proportion:
28 seed %, 29 weight %

Packaging unit:
25kg paper sack or 500kg BigBag

Fertilisation

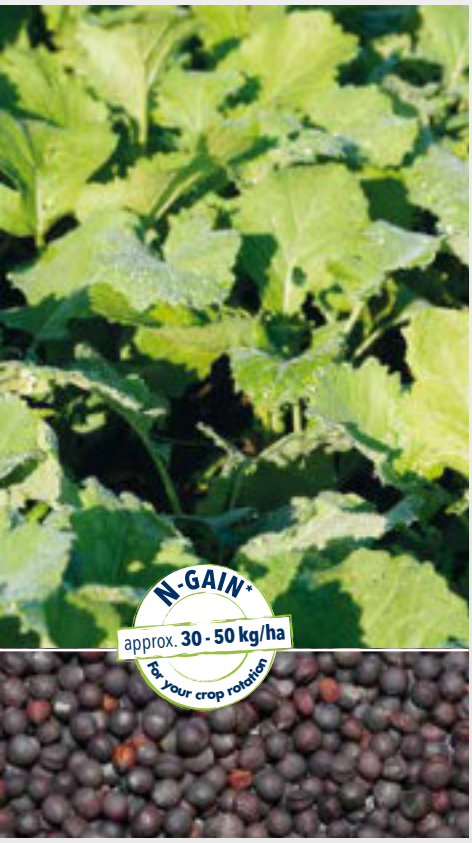
Recommended	
N-flexible	✗
Not required	

Suitable for subsequent crop

Maize	✗✗
Cereals	✗✗
Rapeseed	
Sugar beet	
Potatoes	
Legumes	

viterra® WINTERGRÜN seed proportions:

37% winter turnip rape JUPITER
35% winter forage rape EMERALD
28% crimson clover



viterra® WASSERSCHUTZ

For effective groundwater protection

- High nitrogen absorption capacity and good nutrient storage potential in the winter-hardy varieties
- Stored nutrients are released during the following maize's main growth period from June
- Winter forage rape EMERALD and winter turnip rape JUPITER quickly root into deep soil layers and absorb freely available nutrients
- Tasty source of nutrition for wild game

Sowing
Mid July to late September

Sowing density
10 - 12 kg/ha

Legume proportion:
0%

Packaging unit:
25kg paper sack or 500kg BigBag

Fertilisation

Recommended	✗
N-flexible	
Not required	

Suitable for subsequent crop

Maize	✗✗
Cereals	✗✗
Rapeseed	
Sugar beet	
Potatoes	
Legumes	✗

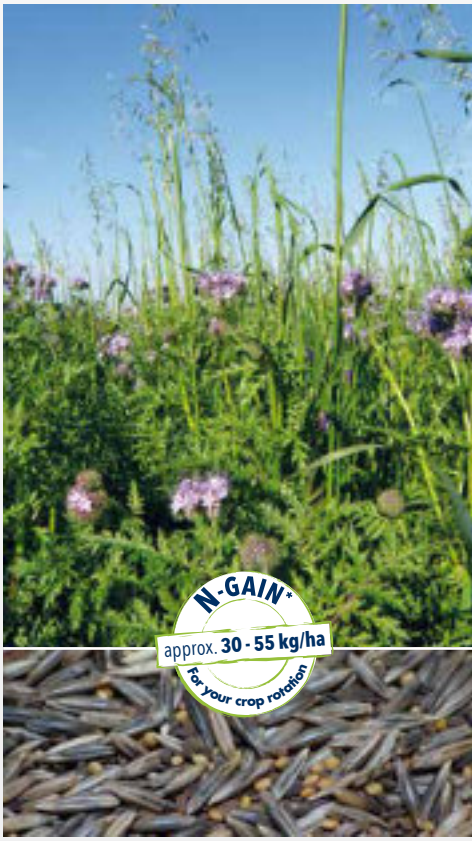
viterra® WASSERSCHUTZ seed proportions:

53% winter forage rape EMERALD
42% winter turnip rape JUPITER
5% marrow stem kale ANGLIAN GOLD

viterra® UNIVERSAL

Cruciferiuos-free and drought tolerant

- Ideally suited for rapeseed crop rotations, it interrupts cruciferous crop rotation diseases, thus contributing to healthy rapeseed cultivation
- Thanks to drought-tolerant components, suitable for universal use
- Quick shade retains tilth and ensures good weed suppression
- Phacelia and clover flowers attract countless insects
- Not winter-hardy, good soil protection



Sowing
Early July to early September

Sowing density
25kg/ha

Legume proportion:
24 seed %, 5 weight %

Packaging unit:
25kg paper sack or 500kg BigBag

Fertilisation	
Recommended	
N-flexible	✗
Not required	

Suitable for subsequent crop	
Maize	✗
Cereals	✗
Rapeseed	✗✗
Sugar beet	✗
Potatoes	
Legumes	

viterra® UNIVERSAL seed proportions:

45% phacelia ANGELIA
28% saia oat PRATEX
15% balansa clover
7% berseem clover OTTO
5% persian clover FELIX

viterra® UNIVERSAL LEGUMINOSENFREI

Cruciferous-free and legume-free

- **Ideal cover crop in rotations with oilseed rape and legumes: interrupts life cycles of diseases and pests**
- Low soil requirements and well adapted to a wide range of climate conditions
- Good utilizer of liquid manure and other nutrients, binding them in the rhizosphere
- Rapid shading preserves soil tilth and ensures good weed suppression.
- Sorghum is an additional sugar source for microorganisms, promoting soil structure.

Sowing
Early July to early September

Sowing density
25kg/ha

Legume proportion:
0%

Packaging unit:
25kg paper sack or 500kg BigBag

Fertilisation	
Recommended	✗
N-flexible	
Not required	

Suitable for subsequent crop	
Maize	✗
Cereals	✗
Rapeseed	✗✗
Sugar beet	✗
Potatoes	
Legumes	✗✗

viterra® UNIVERSAL LEGUMINOSENFREI seed proportions:

43 % phacelia ANGELIA
38 % saia oat PRATEX
15% linseed ZOLTAN
4% sorghum

viterra® UNIVERSAL N-PLUS

Cruciferous-free and nitrogen-fixing

- Ideal for adding to rapeseed crop rotations, disrupts disease cycles and freezes off reliably
- Harmonious collaboration between nitrogen consumers and nitrogen multipliers, so the subsequent crop benefits
- Phacelia and legume flowers feed bees and other insects
- With additional legumes, viterra® UNIVERSAL PLUS needs no additional fertilizer and delivers nitrogen to the following crops

Sowing
Early July to mid August

Sowing density
35 - 40 kg/ha

Legume proportion:
29 seed %, 56 weight %

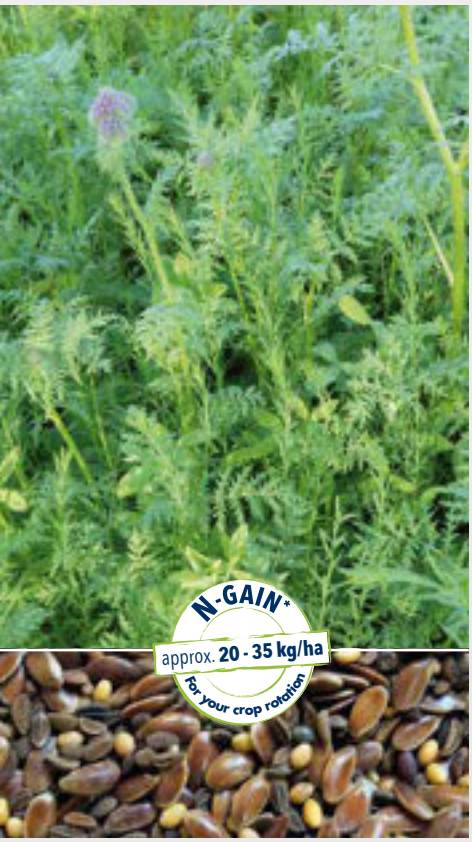
Packaging unit:
25kg paper sack or 500kg BigBag

Fertilisation	
Recommended	
N-flexible	
Not required	✗

Suitable for subsequent crop	
Maize	✗
Cereals	✗
Rapeseed	✗✗
Sugar beet	✗
Potatoes	
Legumes	

viterra® UNIVERSAL N-PLUS seed proportions:

45 % phacelia ANGELIA
26 % saia oat PRATEX
9 % balansa clover
6 % berseem clover OTTO
5 % persian clover FELIX
5 % common vetch ARGON/NEON
4 % summer field pea RUBIN



viterra® RAPS

Frost-sensitive blend without crucifers

- Low-maintenance blend of components that freeze off easily, allowing for easy sowing of the subsequent crop
- Ideal for cereal and rapeseed crop rotations, as changing the type of species disrupts disease cycles
- Effective root penetration improves the soil's structure and encourages air exchange in the soil

Sowing
Early July to late August

Sowing density
15kg/ha

Legume proportion:
24 seed %, 12 weight %

Packaging unit:
25kg paper sack or 500kg BigBag

Fertilisation	
Recommended	
N-flexible	✗
Not required	

Suitable for subsequent crop	
Maize	✗
Cereals	✗✗
Rapeseed	✗✗
Sugar beet	✗
Potatoes	
Legumes	

viterra® RAPS seed proportions:

44 % phacelia ANGELIA
28 % linseed ZOLTAN
13 % balansa clover
9 % berseem clover OTTO
6 % persian clover FELIX

viterra® BODENGARE

A powerhouse for main crops

- Promotes soil structure, revegetation and crumb formation to improve soil fertility
- High-quality blend with a high proportion of valuable legumes
- After early preceding crop (e.g. WPS) as a summer cover crop for soil regeneration, free from grasses
- Free of crucifers, making it especially suitable for oilseed rape crop rotation
- Also suitable for sites with low nitrogen availability

Sowing
Mid June to mid August

Sowing density
45 - 50 kg/ha

Legume proportion:
64 seed %, 89 weight %

Packaging unit:
25kg paper sack or 500kg BigBag

Fertilisation	
Recommended	
N-flexible	
Not required	✗

Suitable for subsequent crop	
Maize	✗✗
Cereals	✗✗
Rapeseed	✗✗
Sugar beet	✗
Potatoes	
Legumes	

viterra® BODENGARE seed proportions:

34% balansa clover
30% phacelia ANGELIA
12% berseem clover OTTO
8% persian clover FELIX
6% sorghum
5% common vetch ARGON/NEON
2% summer field pea RUBIN
1% blue lupin ILDIGO
<1% broad bean AVALON
<1% sunflower

Also available as an organic product

viterra® HÜLSENFRUCHTGEMENGE

The nitrogen supplier

- Very high value as a preceding crop thanks to atmospheric nitrogen fixing, improvement of soil tilth, revegetation and crumb formation
- Hüsenfrucht is the German name for legumes
- Small-seeded broad bean AVALON boasts deep root penetration and improves soil structure
- **Use:** high-quality protein fodder as fresh feed in late summer to autumn, generates nitrogen in crop rotations or when intersown with oilseed rape
- Also suitable for sites with low nitrogen availability

Sowing
July to mid August

Sowing density
120kg/ha to 150kg/ha

Legume proportion:
100%

Packaging unit:
25kg paper sack or 500kg BigBag

Fertilisation	
Recommended	
N-flexible	
Not required	✗

Suitable for subsequent crop	
Maize	✗✗
Cereals	✗✗
Rapeseed	✗✗
Sugar beet	✗✗
Potatoes	
Legumes	

viterra® HÜLSENFRUCHTGEMENGE seed proportions:

53% common vetch ARGON/NEON
37% summer field pea RUBIN
10% broad bean AVALON

Sorten greening®

EXPERTS and partners

SortenGreening® contains practice-orientated two-component blends for the professional farmer, precisely tailored to the needs of subsequent crops. The subsequent crop dictates the blend's main variety and its partners. Blends containing multi-resistant oilseed radish **DEFENDER** and TRV-reducing oilseed radishes **SILETTA NOVA** and **AGRONOM** are ideal for subsequent potato crops. The addition of common vetches ensures the development of oilseed radish varieties on fields with low nitrogen supply.

Blends containing **DEFENDER** or **AGRONOM** are ideal for use before sugar beet to tackle beet cyst nematodes. The blend of **VERDI** white mustard and Berseem clover reduces beet cyst nematodes, is easy to sow and freezes off reliably.

Wide range of applications: - in potatoes, sugar beets and cereals - also in fields with low nutrient availabiity - Successful drone sowings throughout Germany

	Main component	Seed-share (in %)	Mixing partner	Seed-starch (kg/ha)	Seed date	Legume share Seeds	Legume share Weight	N-gain for your crop rotation (kg/ha)
POTATOES and SUGAR BEET	**OILSEED RADISH DEFENDER** Multi-resistant	71	Common vetch	50 – 60	Early August - late August	29 %	67 %	45 - 90
POTATOES and SUGAR BEET	**OILSEED RADISH AGRONOM** Nematode-resistant	70	Common vetch	50 – 60	Early August - early September	30 %	67 %	45 - 90
POTATOES	**OILSEED RADISH SILETTA NOVA**	70	Common vetch	50 – 60	Early August - late August	30 %	69 %	45 - 90
SUGAR BEET	**WHITE MUSTARD VERDI** Nematode-resistant	79	Berseem clover	12 - 15	Early August - late September	21 %	10 %	25 - 55

Packaging unit:
25kg paper sack or 500kg BigBag

Fertilisation:
SortenGreening® oilseed radish blends with common vetch do not require additional fertilisation.

SortenGreening® white mustard VERDI with Berseem clover is N-flexible.

- for professional growers

for sugar beet and potatoes

Oilseed radish **DEFENDER** + common vetch

- Multi-resistant top variety for potato crops
- Also reduces beet nematodes
- Rapid initial development and good weed suppression

Oilseed radish **AGRONOM** + common vetch

- TRV-reducing oilseed radish with common vetch
- Also reduces beet nematodes
- Reliable ground cover, shade and weed suppression thanks to fastest initial development

for potatoes

Oilseed radish **SILETTA NOVA** + common vetch

- TRV-reducing oilseed radish with common vetch
- Low-growing and late-blooming
- Especially leafy

for sugar beet

White mustard **VERDI** + Berseem clover

- High resistance to beet cyst nematodes (H1 in France - highest resistance class)
- Easy to sow and rapid ground cover
- Freezes off reliably

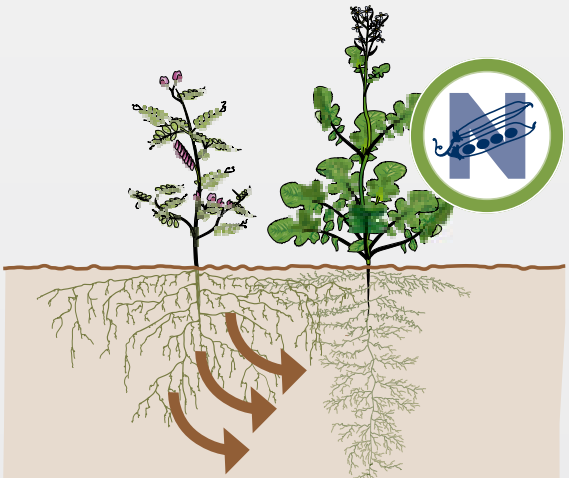
Nitrogen symbiosis: oilseed radish and common vetch

'Vetch kisses oilseed radish'

Stock benefits in a number of ways:

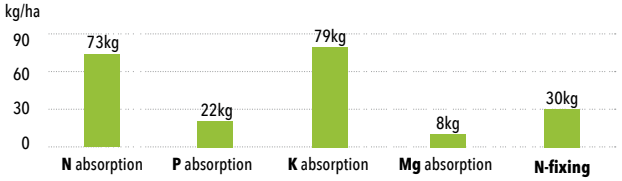
- Fewer nitrogen-consuming plants per area, i.e. more nutrients for each individual plant
- Vetch's N-fixing is stimulated by the oilseed radish's N-consumption
- Vetch sheds old plant matter
- Vetch deposits organic material (rhizodeposition)

= nitrogen flow to oilseed radish approx. 45 - 85 kg/ha



***Rhizodeposition** is the effect that makes a combination of vetch and oilseed radish so effective. Organic materials are deposited into the soil through the roots (mucilage, dead cells).*

Main nutrients found in **AGRONOM + common vetch** (160 dt/ha FM/ha)



Supposition: 60% allowability for subsequent crop

Price: 2.4€/kg N (calcium ammonium nitrate)
103kg N x 60% x 2.4€ → 148€/ha

Price: 1.25€/kg K20 (Kornkali 60%)*
79kg K x 0.6 x 1.25€ → 59€/ha

207€/ha

⊕ plus increased growth reliability

⊕ plus less weed competition

⊕ plus more soil fertility

⊕ plus freezing off reliably

Source for nutrient contents: Bayrisches Landesamt für Landwirtschaft: nutrient contents of secondary crops and cover crops

* Valid as of December 2022

viterra Green Manure Blend

EXPERTS

for special applications

viterra® special blends are cover crop blends for special applications such as companion cropping.

Undersowing cover crops refer to sowing a secondary crop into an already established or simultaneously sown main crop. The undersown crop is often intended to grow beneath the main crop, utilizing the space and resources after the main crop is harvested or while it is still growing. The purpose of undersowing can be varied, including improving soil health after the main crop, protecting the soil from erosion and suppress weeds after the main harvest and using the undersown cover crop for animal feed after harvesting main crop.

While growing the undersown cover crop function as a living mulch: shading the soil, reducing evaporation and keeping the soil moisture more consistent. This is particularly beneficial during dry periods. It helps to regulate soil temperature: buffer soil temperature fluctuations, keeping the soil cooler in hot weather and slightly warmer in cooler periods. This can create a more stable environment for the roots of the main crop.

In cereals the **viterra® UNTERSAAT KLEE PLUS** ('undersowing clover plus') protects the soil and generates additional nitrogen. For maize, the **viterra® UNTERSAAT FRÜH** and **viterra® UNTERSAAT SPÄT** are suitable because of their shade-tolerant components.

Companion cropping (Beisaaten) is broader and generally refers to sowing one or more additional crops alongside the main crop, either at the same time or shortly after. These companion plants are often chosen for their beneficial interactions with the main crop. Both **viterra® BEISAAT** are suitable to be companion crops in rapeseed. Sown together with rapeseed this blends offer additional nitrogen to booster rape development, shade the soil to suppress weeds and repell pests and attracting beneficial insects. They act as a nurse plant for the young rapeseed and die off in winter.

Viterra® BEISAAT GROB has high-value legumes with deep rooting broad bean **AVALON** and lupin **ILDIGO**, **viterra® BEISAAT FEIN** contains small grained clover.

viterra® UNTERSAAT KLEE PLUS

Clover undersowing for cereals or rotational fallow

- Easy spreading and reliable establishment among young cereal crops
- Very generous ground cover after cereal harvests for reliable erosion protection and good weed suppression
- Perennial ryegrass' good root growth and clover's good nitrogen fixing improve humus content and provide nitrogen for the subsequent crop
- Can be used for grazing or cutting
- **Tip:** viterra® UNTERSAAT KLEE PLUS is also suitable to be sown directly as forage crop for animal feeding

Sowing
Undersowing in summer cereals: 2-leaf stage up to approx. 2 weeks before row closure. Undersowing in winter cereals: starting after last frost

Sowing density
15kg/ha (undersowing), 40kg/ha (direct sowing)

Legume proportion:
29 seed %, 7 weight %

Packaging unit:
15kg paper sack or 500kg BigBag

viterra® UNTERSAAT KLEE PLUS seed percentages:
71% perennial ryegrass
29% white clover

Suitable for subsequent crop

Maize	XX
Cereals	XX
Rapeseed	XX
Sugar beet	X
Potatoes	
Legumes	

The small-seeded field beans AVALON and ATLANTIS are particularly suitable for companion cropping at 8-12 seeds/m²: they protect and promote rapeseed and freeze reliably.

viterra® BEISAAT FEIN
viterra® BEISAAT GROB

Intersowing for high-yield rapeseed cultivation

- Intersowing reduces weed competition in the main crop and distracts pests (cabbage fly, rape flea beetle)
- Fenugreek repels various rapeseed pests
- Fine-seeded legumes support soil life and nitrogen supply through into winter
- The intersown crop freezes off, the remaining mulch offers erosion protection and protects the main crop from frost

viterra® BEISAAT FEIN:

- Small seeded clover to protect and promote oilseed rape

viterra® BEISAAT GROB:

- Supports Rapesed by deep rooting, best protection against pests and additional nitrogen

Sowing Together with rapeseed (two-tank system) or shortly before

Sowing density: 8 - 10 kg/ha

Sowing density Grob: 35 kg/ha

Legume proportion: 100%

Packaging unit: 15kg paper sack or 500kg BigBag

viterra® BEISAAT FEIN seed proportions:
46% balansa clove
26% berseem clover OTTO
22% fenugreek
6% persian clover

viterra® BEISAAT GROB seed proportions:
58% broad bean AVALON
42% blue lupin ILDIGO

Suitable for subsequent crop	
Maize	
Cereals	✗
Rapeseed	✗✗
Sugar beet	
Potatoes	
Legumes	

viterra® UNTERSAAT GRAS

Well-thought-out strategy for integrating beneficial blends into maize

- Providing multiple benefits, from soil protection and improvement to nutrient management, while minimizing negative impacts on the main maize crop.
- The two different sowing times offer flexibility depending on the farmer's specific needs and management practices.
- **Tip**: To avoid herbicide intolerance, sowing should take place at least 6 weeks after the last herbicide treatment

viterra® UNTERSAAT GRAS FRÜH:

- Slow-developing blend with dense turf formation and high herbicide tolerance, which allows sowing together with maize.
- Fescue species tolerate drought particularly well and ensure secure crop establishment
- Red fescue leaves a large root mass in the soil, which improves the load-bearing capacity and humus balance

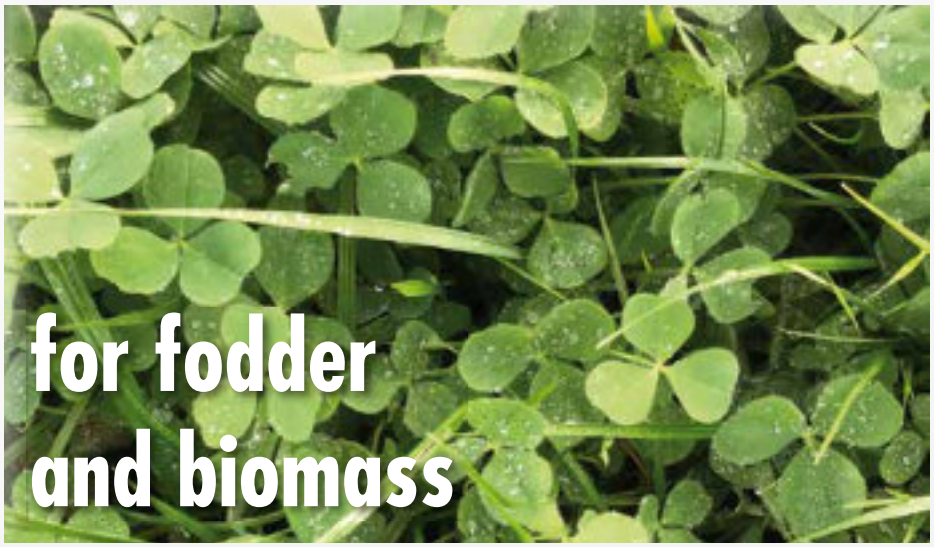
viterra® UNTERSAAT GRAS SPÄT:

- The more vigorous Italian ryegrass combined with late Perennial ryegrass ensures high cultivation reliability
- Slow-developing blend with high shade tolerance and dense turf formation and high herbicide tolerance
- Grass tolerate drought particularly well and ensure good crop establishment

Sowing Shortly before or with maize sowing	6-8 weeks after maize sowing, at 6-8-leaf stage in maize
Sowing density FRÜH: 8 - 10 kg/ha	**Sowing density SPÄT:** 10 - 15 kg/ha
Legume proportion: 0%	
Packaging unit: 10kg paper sack or 500kg BigBag	15 kg paper sack or 500kg BigBag
viterra® UNTERSAAT GRAS FRÜH seed proportions: 87% red fescue 13% meadow fescue	**viterra® UNTERSAAT GRAS SPÄT seed proportions:** 51% italian ryegrass (tetraploid) 49% perennial ryegrass

V-MAX® Fodder & Biomass

EXPERTS



for fodder and biomass

V-Max® blends are ideal for biomass production for biogas facilities or for cattle fodder. There's always the right blend to suit the purpose and subsequent crop. Summer cereal blends are suitable as secondary crops after early harvest grains. Winter-hardy blends, on the other hand, can provide biomass as a cover crop or main crop.

Blends with legumes are suitable for locations with low N availability and increase the value of fodder as a valuable protein component. Pure cereal blends, however, are very well suited to potato crop rotations. Fodder gaps can be effectively closed with **V-Max®** grass blends.

V-Max® LUNDSGAARDER GEMENGE

Winter-hardy blend for fodder and soil fertility

- Suitable for exceptionally high-quality fodder production or as a winter cover crop for green manuring and soil improvement
- Italian ryegrass uses growth phases over winter, while winter vetch and winter field pea are valuable protein components in fodder
- Balanced combination of nitrogen multipliers and consumers has a positive impact on plant growth and soil life
- Also impressive under the ground thanks to enormous root formation, actively contributing towards humus formation and carbon fixing - ideally suited to carbon farming
- **Tip:** Also suitable for undersowing in maize

Sow: Late August to mid September or in spring as an undersown crop with maize

Sowing density:
50kg/ha, undersown 15 - 20 kg/ha

Harvest window: April to early May

Harvest: As green fodder with silage trailer, for silage use with silage trailer or harvester after pre-wilting phase

Legume proportion:
48 seed %, 71 weight %

Packaging unit:
25kg paper sack or 500kg BigBag

Suitable for subsequent crop

Maize	XX
Cereals	
Rapeseed	
Sugar beet	
Potatoes	
Legumes	

V-Max® LUNDSGAARDER GEMENGE weight proportions:

30% italian ryegrass	22% field pea NS PIONIR
28% crimson clover	21% winter vetch BELLA

V-Max® GRANOPUR
V-Max® GRANOLEG

WPS use before winter

- For biomass production after whole plant silage or an early cereal harvest with cutting before winter
- Increased cultivation reliability thanks to a balanced composition of various cereal components
- V-Max® GRANOLEG with forage pea RUBIN produce protein enhanced biomass
- V-Max® GRANOPUR is a pure cereal blend so very well suited to subsequent potato crops

Sow:
Late March to late May or early July to early August

Sowing density: 130 - 150 kg/ha

Harvest window: June/July when sown in spring, October/November when sown in summer

Harvest: From standing stock to dough stage

Packaging unit: 25kg paper sack or 500kg BigBag

Suitable for subsequent crop

	GRANOPUR	GRANOLEG
Maize	XX	XX
Cereals	XX	XX
Rapeseed	X	X
Sugar beet	X	
Potatoes	XX	X
Legumes	X	

V-Max® GRANOPUR weight proportions:

26 % spring rye OVID
26 % saia oat OTEX
25 % oat
23 % spring triticale SU CARL

V-Max® GRANOLEG weight proportions:

26 % oat
25 % spring field pea
18 % spring rye OVID
16 % saia oat OTEX
15 % spring triticale SU CARL

V-Max® WICKROGGEN
V-Max® WICKROGGEN FUTTER

Winter-hardy WPS blend

- Winter-hardy biomass-legume blend for high-yield WPS use with high protein and energy content
- Winter-hardy vetch delivers additional nitrogen for the rye and the subsequent crop
- Excellent erosion protection
- Fixes valuable nitrogen and converts it into climate-friendly biomass

V-Max® WICKROGGEN FUTTER:

- Italian Ryegrass grows rapidly and delivers an additional cutting after harvesting the cereal blend.

Also available as an organic product

Sow: Mid September to mid October

Sowing density: 100 - 120 kg/ha

Harvest window: Dough stage, mid to late June

Harvest: From standing crop, side knives recommended

Legume proportion: 9 seed %, 10 weight %
Wickroggen Futter: 4 Samen-%, 10 % Gewichts %

Packaging unit: 25kg paper sack or 500kg BigBag

Suitable for subsequent crop

Maize	XX
Cereals	X
Rapeseed	X
Sugar beet	X
Potatoes	
Legumes	

V-Max® WICKROGGEN weight proportions:

90 % winter rye INSPECTOR
10 % winter vetch

V-Max® WICKROGGEN FUTTER weight proportions:

75,5 % winter rye INSPECTOR
14,5 % italian ryegras
10 % winter vetch

V-Max® ERBSENTRITICALE

Winter-hardy blend for WPS or grain use

- Flexible: as protein-rich whole-plant silage, for in-house fodder production or harvesting grain
- In the blend, winter triticale NEOMASS/BICROSS offers better stability than other cereals, winter field pea NS PIONIR increases the protein content of fodder
- Good weed suppression, high levels of nitrogen fixing, optimal erosion protection and increased biodiversity
- Fewer mineral fertiliser and plant protection measures required without major impacts on yield

Sow:
Mid September to mid October

Sowing density: 150 - 170 kg/ha

Harvest window: WPS harvest to dough stage, mid to late June or combining

Harvest: From standing crop, side knives recommended

Suitable for subsequent crop

Maize	XX
Cereals	X
Rapeseed	XX
Sugar beet	X
Potatoes	
Legumes	

Legume proportion:
11 seed %, 23 weight %

Packaging unit:
25kg paper sack or 500kg BigBag

V-Max® ERBSENTRITICALE weight proportions:
77 % winter triticale NEOMASS/BICROSS
23 % winter field pea NS PIONIR

V-Max® SOMMERFUTTER

Fodder blend, provide fodder within the same year

- Provides additional quality fodder when used as a summer cover crop
- Annual ryegrass provides sufficient structure, Persian clover provides a high protein content, tuft-forming Italian ryegrass allows winter greening after cutting
- High value as a preceding crop thanks to good tilth condition, a high level of root penetration and humus formation – ideally suited to carbon farming

Sow:
Late June to late July (for greening, up to late August)

Sowing density: 25 - 30 kg/ha

Harvest window: October

Harvest: As green fodder with silage trailer, for silage use with silage trailer or harvester after pre-wilting phase

Suitable for subsequent crop

Maize	XX
Cereals	XX
Rapeseed	XX
Sugar beet	X
Potatoes	
Legumes	

Legume proportion:
47 seed %, 28 weight %

Packaging unit:
20kg paper sack or 500kg BigBag

V-Max® SOMMERFUTTER weight proportions:
36% italian ryegrass (tetraploid)
36% annual ryegrass (diploid/tetraploid)
28% persian clover FELIX

V-Max® FUTTER

Grass-clover blend for harvesting after winter

- Suitable for dual-culture use systems in combination with maize or sorghum
- Nutrient uptake before the winter break and in early spring prevents loss
- Organic substances from roots and stubble improve humus balance and ensure good pre-crop value – ideally suited to carbon farming
- Not recommended for dry sites or soils with low water storage capacity
- **Tip**: Also suitable for undersowing with maize

Sow: Mid to late September as a winter cover crop. Late July to early August as a summer cover crop

Sowing density: 35 - 40 kg/ha, undersown 15kg/ha

Harvest window: April to early May, can be cut before winter if sown early

Harvest: As green fodder with silage trailer, for silage use with silage trailer or harvester after pre-wilting phase

Legume proportion:
46 seed %, 51 weight %

Packaging unit:
20kg paper sack or 500kg BigBag

Suitable for subsequent crop

Maize	XX
Cereals	XX
Rapeseed	XX
Sugar beet	X
Potatoes	
Legumes	

V-Max® FUTTER weight proportions:
51 % crimson clover
49 % italian ryegrass

According to the recommendation of the North German Chamber of Agriculture

V-Max® KLEEGRAS

Clover blend for perennial cultivation

- One to two (or more) main usage years, suitable for grazing and cutting
- Dense growth with excellent flexibility despite few location requirements
- Very low costs per cut as annual sowing is not necessary
- Forms dense, walkable sod
- When red clover dies down in the second year, white clover makes more of a contribution

Also available as an organic product

Sowing
Direct sowing: August to mid September

Sowing density
30 - 35 kg/ha for direct sowing

Harvest window
April to late September

Legume proportion:
56 seed %, 37 weight %

Packaging unit:
15kg paper sack or 500kg BigBag

Suitable for subsequent crop

Maize	XX
Cereals	XX
Rapeseed	XX
Sugar beet	X
Potatoes	
Legumes	

V-Max® KLEEGRAS weight proportions:
33 % perennial ryegrass JURAS
21 % red clover SW YNGVE
16 % white clover SW HEBE
15 % italian ryegrass (4n) MERVANA
15 % hybrid ryegrass GALA

DE-Öko-003
DE-Öko-009

EXPERTS for organic agriculture

The demand for organically grown foods has grown significantly over the last few years. The number of organic farms has increased, along with the demand for suitable organic seed with special characteristics. SAATEN-UNION offers varieties as well as blends for use as cover crops and in forage production.

Viterra® organic blends are a valuable basis for good crop rotation in organic farming. The main focus is on optimising the flow of nutrients within crop rotations. The need for good weed suppression is met by fast-growing components in these reliable blends. Cover crop blends with nectar and pollen plants encourage biodiversity and increase agroecological value.

V-Max® organic blends ensure high fodder yields and high-quality feed in organic farming.

The following mixtures were described on the previous pages:

viterra® INTENSIV ÖKO page 13
The health blend

viterra® POTATO ÖKO

The versatile boost for potatoes

Weight proportions: viterra® POTATO ÖKO:

37 % common vetch
30 % bitter lupin ILDIGO
19 % oilseed radish SILETTA NOVA
14 % saia oat PRATEX

more on page 14

viterra® BODENGARE ÖKO

The powerhouse for crop rotations

Weight proportions: viterra® BODENGARE ÖKO:

30 % fodder pea RUBIN
30 % broad bean AVALON
18 % common vetch
12 % bitter lupin ILDIGO
6 % berseem clover OTTO
2 % phacelia ANGELIA
2 % sunflower

more on page 23

V-Max® WICKROGGEN ÖKO page 29
Winter-hardy WPS blend

V-Max® WICKROGGEN FUTTER ÖKO page 29
Winter-hardy WPS blend and fodder use

V-Max® LUNDSGAARDER GEMENGE ÖKO page 28
Winter-hardy blend for fodder and soil fertility

V-Max® KLEEGRAS ÖKO page 31
Grass-clover blend for perennial cultivation

V-Max® ERBSENTRITICALE ÖKO page 30
Winter-hardy blend for WPS or grain use

viterra® DEPOT ÖKO

The nutrient reservoir

- Vigorous varieties bind nutrients, storing them during the winter and making them available to the following crop
- Efficient suppression of weeds thanks to rapid initial development
- A balanced blend offers excellent root penetration of the soil by deep and flat rooters, stabilising soil structure and improving the soil's infiltration capacity
- Especially suited to crop rotations with legumes as the main crop

Sowing
Late July to late August

Sowing density
20kg/ha

Legume proportion:
0%

Packaging unit:
25kg paper sack or 500kg BigBag

Fertilisation	
Recommended	X
N-flexible	
Not required	

Suitable for subsequent crop	
Maize	XX
Cereals	XX
Rapeseed	
Sugar beet	
Potatoes	
Legumes	XX

viterra® DEPOT ÖKO weight proportions:

45 % saia oat PRATEX
23 % oilseed radish SILETINA
15 % white mustard ALBATROS
12 % phacelia ANGELIA
5 % sunflower

viterra® SPRINT ÖKO LIGHT

The quick starter

- Exceptionally rapid ground cover, so suitable as a cover crop before winter cereals or for late greening after maize
- Forms a lot of organic mass over a short vegetation period
- Fast-growing buckwheat in particular ensures effective ground cover, suppressing weeds and protecting the surface of the soil
- All varieties have a high ecological value for bees and other insects in the form of nutrition and shelter

Sowing
July to early September

Sowing density
15kg/ha

Legume proportion:
0%

Packaging unit:
25kg paper sack or 500kg BigBag

Fertilisation	
Recommended	X
N-flexible	
Not required	

Suitable for subsequent crop	
Maize	XX
Cereals	XX
Rapeseed	
Sugar beet	
Potatoes	
Legumes	XX

viterra® SPRINT ÖKO weight proportions:

45 % white mustard ALBATROS
43 % buckwheat
12 % phacelia ANGELIA

viterra
Green Manure Blend

EXPERTS

for nature and environment

Agri-environmental policies increasingly emphasize the responsibility of agriculture in maintaining and enhancing biodiversity. Cover crops are recognized as a valuable tool within agricultural policy to support biodiversity. They provide habitat and food sources for various organisms above and below ground, including pollinators and beneficial insects.

Cover crops can **enhance soil health**, which in turn supports a greater diversity of soil organisms. Flowering cover crops directly provide **nectar and pollen** for pollinators. Non-flowering cover crops can offer **nesting sites** for pollinators. Some cover crops can attract **beneficial predatory insects** that help control pests, reducing the need for chemical interventions that can harm biodiversity.

Diverse mixtures of cover crop species can lead to greater overall biodiversity in the agricultural system.

• Agricultural policies and schemes (e.g., Countryside Stewardship, Sustainable Farming Incentive in the UK; CAP in the EU) often **incentivize the use of cover crops** for their environmental benefits, including biodiversity. The use of cover crops can contribute to more **resilient and balanced agro-ecosystems**. Cover crop are an important component.

The **viterra® nature and environment blends** include cover crop mixtures for flowering areas, wild meadow and fallow land. Thanks to their diverse composition, the blends provide food and habitat for many animals and insects which need to be supported.

Planting and establishing strips and fields without cash crop production is a simple and effective tool to increase biodiversity. Protecting nature and environment and active stewardship for wildlife is becoming increasingly important for a healthy society and thus for the farmers work and responsibility.

Targeted greening with cover crop blends on non-productive areas is beneficial from the perspective of:

- Water protection (protection against nutrient leaching)
- Field hygiene
- Targeted management and promotion of beneficial soil life
- Reliable provision of food for insects

Why Cover Crop Mixtures?

- Reduction of cultivation risk through high-quality mixture components.
- Targeted use of plant synergies: optimal utilization of light, water, and nutrients.
- Intensive root development and promotion of soil life through tailored mixture composition.
- More tolerant to climate stress.
- Active green cover for the targeted suppression of volunteer crops and prevention of green bridges.

viterra® ROTATIONSBRACHE

Bi-annual and drought resistant

- Intentional fallow greening
- Also suitable for dry locations
- Good weed suppression with high value legumes
- Divers root types increase soil fertility

Sowing
In spring (March to April) or in summer (begin of July till begin of September)

Sowing density
25 kg/ha

Legume proportion:
Seed 56% / weight 44 %

viterra® ROTATIONSBRACHE seed percentages:

29 % crimson clover
19 % linseed JULIET
19 % alfalfa
14 % perennial forest rye JOHAN
11 % phacelia ANGELIA
6 % fenugreek
2 % winter vetch

Fertilisation	
Recommended	
N-flexible	
Not required	✗

viterra® DAUERBRACHE

Perennial, biodiverse, ecological greening or fallow areas

- Climate-stable blend for many growing conditions
- Good ground cover and root penetration for soil protection
- Balanced composition provides additional nitrogen during the fallow periode

Sowing
In spring (March to April) or in summer (begin of July till begin of September)

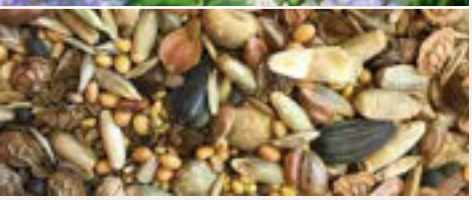
Sowing density
15kg/ha

Legume proportion:
Seed 80 % / weight 88 %

viterra® DAUERBRACHE seed percentages:

21 % white clover
20 % crimson clover
18 % red clover
13 % red fescue
11 % alfalfa
7 % serradella
6 % meadow fescue
4 % sainfoin

Fertilisation	
Recommended	
N-flexible	
Not required	✗



viterra® NRW BUNTE BRACHE

Perennial and colourful

- Focussing on long time flowering and diverse Flower types
- Promoting insects and other wildlife
- Long-lasting greening and soil protection

Sowing
In spring (March to April) or in summer (begin of July till begin of September)

Sowing density
20 kg/ha

Legume proportion:
Seed 39 % / weight 51 %

viterra® NRW BUNTE BRACHE seed proportions:

28 % white clover
15 % alfalfa
12 % red clover
10 % phacelia ANGELIA
8 % meadow fescue
8 % sainfoin
5 % winter forage rape
3 % crimson clover
3 % linseed
3 % perennial forest rye JOHAN
2 % buckwheat HAJNALKA
2 % spring oats
1 % blue bitter lupin ILDIGO
1 % sunflower PEREDOVICK

Fertilisation

Recommended	
N-flexible	
Not required	✗

viterra® PUFFERSTREIFEN

Ideal for protection of waterside and ditches

- Simple to establish, intentional fallow greening
- Long-lasting blend with low maintenance work
- Protects banks and fallow land against erosion

Sowing
In spring (March to April) or in summer (begin of July till begin of September)

Sowing density
15-20 kg/ha

Legume proportion:
Seed 21% / weight 21%

viterra® PUFFERSTREIFEN seed proportions:

53% Red fescue
26% Meadow fescue
21% White clover

Fertilisation

Recommended	
N-flexible	
Not required	✗

EXPERTS in flowering

These flowering blends focus on diverse flowering cover cover crop species. They are all free of grasses and cereals. They fit perfectly in agricultural crop rotations and have different emphasis on the requirements of the following crop.

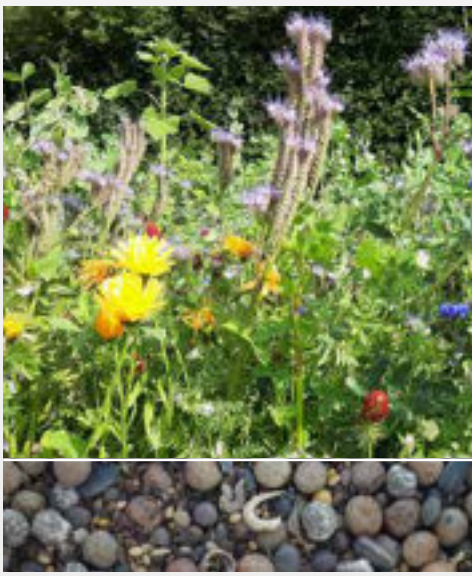
Optimum sowing time is spring, after frost and before June. They increase the fertility and protect the soil over winter.

All **viterra® flowering blends** contain sufficient legumes in the mixtures promote blend growth and enhance soil fertility without additional fertilizer.

viterra® BIENE

Without cruciferous plants, grasses and buckwheat

- Flowering mixture with long flowering phase for high biodiversity and positive impact on soil structure
- The absence of agricultural crop families helps to prevent against crop rotation diseases



Sowing density 15-20 kg/ha

Legume proportion: Seed 75% / weight 84%

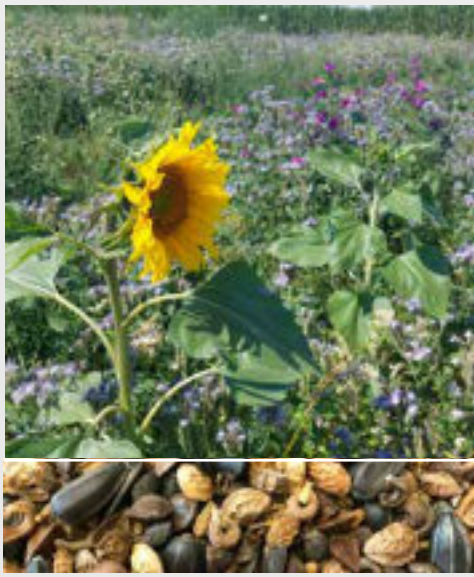
viterra® BIENE seed proportions:

31 % berseem clover OTTO	6 % alfalfa	1 % spring pea RUBIN
31 % balsana clover	4 % serradella	<1 % blue bitter lupin ILDIGO
15 % phacelia ANGELIA	2 % common vetch ARGON/NEON	< 1% sunflower,
8 % dill	1 % calendula	< 1% persian clover

viterra® BIENE ECO

Flowering blend with tolerance to cold temperatures

- Economically and ecologically interesting blend of annual and perennial flowering plants
- Composition of twelve species for high performance to the ecosystem
- Strong practical evidence and good results from testing.



Sowing density 12,5 kg/ha

Legume proportion: Seed 54% / weight 34%

viterra® BIENE ECO seed proportions:

23 % white clover	8 % alfalfa	3 % chicory
18 % red clover	6 % buckwheat	1 % sunflower
13 % phacelia ANGELIA	5 % calendula	< 1 % mallow
12 % dill	5 % sainfoin	<1 % borage

viterra® BIENE ECO 2.1

Flowering blend with high biodiversity

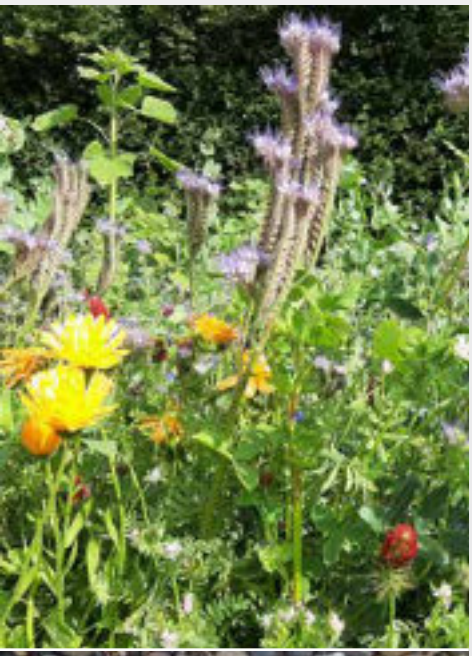
- Fourteen different flowering species provide a biodiverse growing and support the wild life
- Long growing periods cover the soil and give time to regenerate the natural soil life
- Good protection against erosion and degradation

Sowing density 15 kg/ha

Legume proportion: Seed 26% / weight 7%

viterra® BIENE ECO 2.1 seed proportions:

21 % phacelia ANGELIA	7 % dill	4 % white sweet clover
13 % linseed JULIET	6 % buckwheat	3 % fennel
9 % alfalfa	6 % cress	2 % borage
8 % oilseed radish SILETINA	6 % calendula	2 % sunflower
7 % white clover	6 % red clover	



viterra® MULTIKULTI

Annual flowering blend with multiple positive effects

- Flower blend for high biodiversity and with diverse usage
- Forms roots in different soil layers and stabilizes the soil
- Free of grasses for trouble-free growth control in the follower crop
- **viterra® MULTIKULTI** is an effective protection against erosion and exsiccation
- As a cover crop after WCS or cereal harvest or as border-strip green covering for maize and other crops

Sowing density 25,5 kg/ha

Legume proportion: Seed 40% / weight 58%

viterra® MULTIKULTI seed proportions:

29 % phacelia ANGELIA	12 % persian clover	<1 % sunflower
20 % berseem clover	4 % serradella,	<1 % borage
14 % oilseed radish AGRONOM	3 % common vetch	<1 % spring forage pea
14 % white mustard GAUDI	< 1 % blue bitter lupin	<1 % buckwheat

Cover crops for game cover

viterra® HORRIDO

Biennial wildflower blend

- Hardy components provide grazing and cover even in winter and during frost
- **Cultivation tip**: Sow parts of the area with double crop spacing to create attractive open spaces for pheasants and partridges

Sowing rate: 25 kg/ha

Sowing time: mid-March to the end of June

Percentage by weight viterra® HORRIDO:

27 % perennial forage rye JOHAN	2,5 % Persian clover FELIX
25 % buckwheat	2 % linseed ZOLTAN
10 % saia oat PRATEX	2% red clover
6 % serradella	2 % alfalfa
6 % sunflower	1,5 % Phacelia ANGELIA
6 % winter vetch BELLA	1 % oilseed radish SILETINA
3 % berseem clover	1 % winter turnip rape
3 % Malva sylvestris	1 % marrow stem kale
1 % oilseed radish SILETINA	1 % winter turnip rape
3 % winter fodder rape	1 % marrow stem kale

viterra® HOCHWILD

Two-years wild blend without crucifers

- Suitable for game fields on land that is not used for agriculture
- Excellent wild grazing with tasty protein plants

Sowing rate: 25 kg/ha

Sowing time: mid-March to the end of June

Percentage by weight viterra® HOCHWILD:

37 % sweet lupin	6 % berseem clover OTTO
31 % winter forage pea NS PIONIR	6 % red clover
8 % crimson clover	5 % alfalfa
7 % balsana clover	

viterra® NIEDERWILD

Biennial, versatile, without cruciferous plants

- Developed together with the Schleswig-Holstein State Hunting Association (LJVSH) to meet the requirements of small game.
- Provides long-lasting grazing and sufficient cover.

Sowing rate: 25 kg/ha

Sowing time: April to June

Percentage by weight viterra® NIEDERWILD:

32 % buckwheat	6 % alfalfa
13 % perennial forest rye JOHAN	5 % birdfoot trefoil
10 % sunflower	3 % phacelia ANGELIA
10 % linseed	2,5 % red clover
8 % sainfoin	2,5 % white clover
7 % blue bitter lupin	1 % mallow
	<1% medicago lupinula

Cultivation tip: If the seeds are scattered by hand, sand can mixed in, for example, to prevent segregation

Cover crops for gardening

LUNDSGAARD® BLÜHZAUBER

The annual flowering meadow

- Visually pleasing, featuring a range of more than 40 flowering varieties with different petal colours and shapes
- Continuous flowering period from late May into autumn.

LUNDSGAARD® BLUMENTEPPICH

Perennial flowering blend

- Perennial species flower in the year of sowing, then biennial and perennial species dominate from the second year
- Offers shelter for insects to overwinter as well as nutrition and shelter for birds and wild animals
- Can be cut in autumn or spring

Sow:	Sowing density:	Packaging unit:
April to mid June	5 - 7 g/m²	25g, 100g, 500g, 1kg, 25kg

viterra® BLÜHZAUBER components:

Marigold, Mexican aster, California poppy, yellow toadflax, baby blue eyes, leucanthemum, field poppy, sunflower... and many more

viterra® BLUMENTEPPICH weight proportions:

42% annuals and 58% perennials such as chamomile, sage, bluebell, tufted pansy, common poppy, coriander, cornflower, dog daisy, marigold, red flax, yarrow, echinacea, hollyhock, mallow, tansy... and many more

For gardeners and nature fans

Our online shop for small orders.
Visit us at **www.LUNDSGAARD.de**

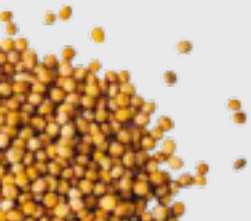
EXPERTS at a glance

Species	Variety	Sowing window			Sowing density, pure seed kg/ha	Thousand kernel weight in g	Page
		July	Aug	Sep			
White mustard nematode resistance level 1*	**NARWAL**, **VERDI** H1				15 - 25	6 - 10	44
White mustard nematode resistance level 2*	**LUCIDA**, **ABDATE** **CLINT**, **TOPAS**, **GAUDI**, **VETO**, **MASTER**, **ACCENT** **SUNNY**, **SCOUT**				15 - 25	6 - 10	44 – 45
Oilseed radish nematode resistance level 1*	**AMIGO** **PAUL**				20 - 30	10 - 15	46 – 47
Oilseed radish nematode resistance level 2*	**SUNDAY** **AGRONOM** **RELAX**, **COMPASS**, **COMET** **CONCORDE**, **SUCCESS**, **SULINA**				20 - 30	10 - 15	46 – 47
Oilseed radish multi-resistant level 1*	**ANGUS**				20 - 30	10 - 15	48
Oilseed radish multi-resistant level 2*	**DEFENDER**, **CONTROL** **CONTRA** **CARUSO**				20 - 30	10 - 15	48
Oilseed radish	**BENTO**, **SILETTA NOVA** **SILETINA**, **AKIRO** **INFORMER**, **GALLIUS**				20- 30	10 - 15	53 55
White mustard	**ALBATROS**, **ASCOT** **COVER**, **CLASSIC**				15 - 25	6 - 10	56
Tillage radish	**MINER**, **STINGER**				6 - 8	10 - 15	55
Abyssinian mustard	**ABEBA**				15	3 - 4	55
Saia oat	**PRATEX**, **OTEX**, **TRADEX** **LUNEX**, **CODEX**				60 - 80	15 - 30	54
Nematode-neutral phacelia	**ANGELIA**, **AMERIGO**				8 - 12	2	58
Spring forage rape	**JUMBO 00**				10 - 20	3 - 7	57
Winter forage rape	**EMERALD**, **FONTAN 00**, **PRESTIGE 00**				8 - 20	3 - 7	57
Marrow stem kale	**GRÜNER ANGELITER**, **CAMARO**, **ANGLIAN GOLD**				3 - 4	3,5 - 4,6	58

* Resistance levels are based on resistance to *Heterodera schachtii* and were determined by way of official tests.

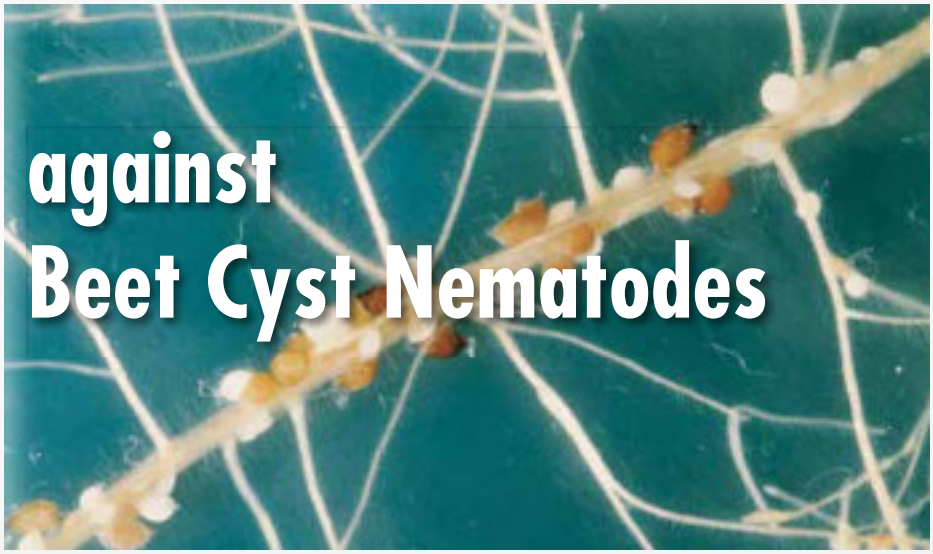
Fertilisation according to local recommendations.

Species	Variety	Sowing window			Sowing density, pure seed kg/ha	Thousand kernel weight in g	Page
		July	Aug	Sep			
Winter forage rye	**PROTECTOR** **LUNATOR**, **TRAKTOR**	■■■■ ■■■■	■■■■ ■■■■	■■■■ ■■■■	120 - 180	27 - 35	63
Spring forage rye	**OVID**, **SU VERGIL**	■■■■	■■■■	■■■■	120 - 160	27 - 35	64
Spring triticale	**SU CARL**	■■■■	■■■■	■■■■	130-170	25 - 35	64
Perennial rye	**JOHAN**	■■■■	■■■■	■■■■	140 - 150	17-18	64
Winter turnip rape	**JUPITER**	■■■■	■■■■	■■■□	8 - 20	5 - 10	57
Annual ryegrass	**ALISCA** tetraploid, **DIPLOMAT** diploid	■■■■ ■■■■	■■■■ ■■■■	■■■□ ■■■■	40 - 45	2 - 4	64
Sticky nightshade	**WHITE STAR**, **DIAMOND**	■■■□	□□□□	□□□□	3	3 - 4	53
Brown mustard	**ENERGY**, **TERRAFIT** , **TERRAPLUS**	□□□□	■■■■	■■■□	10-12	2 - 3	56
Linseed	**JULIET**, **ZOLTAN**	□□■■	■■■□	□□□□	20 - 30	7 - 8	58
Fava bean	**AVALON**, **ATLANTIS**	■■■■	■■□□	□□□□	130 - 150	150- 580	60
Persian clover	**FELIX**	□■■■	■■■□	□□□□	15 - 20	1,3 - 1,8	60
Berseem clover	**OTTO**	□■■■	■■■□	□□□□	30 - 35	2,6 - 4	60
Balansa clover		□■■■	■■■□	□□□□	5 - 10	0,9 - 1,1	60
Crimson clover		□□□■	■■■■	■■□□	25 - 35	3 - 5	62
Buckwheat	**TABOR**, **TABEA** **ESQUIRE**, **ESKALAR**, **HAJNALKA**	□□□□	■■■■	■■□□	60 - 80	25 - 35	59
Common vetch	**ARGON**, **NEON**	■■■■	■■■■	■■□□	100 - 130	50 - 62	62
Winter vetch	**LATIGO**, **BELLA**	■■■■	■■■■	■■□□	80 - 160	20 - 50	62
Blue lupin	**ILDIGO**	■■■■	■■□□	□□□□	160 - 180	160 - 200	61
Serradella		□□■■	■■■□	□□□□	30 - 50	3 - 5	61
Alfalfa	**PROTEUS**, **POSEIDON**, **LINSEY**	□□■■	■■■■	□□□□	25 - 30	1,5 - 2,5	62
Spring field pea	**RUBIN**	■■■■	■■□□	□□□□	120 - 160	100 - 180	61
Winter field pea	**NS PIONIR**	■■■■	■■□□	□□□□	120 - 160	100 - 180	61
Vetchling	**ETERNA**	■■■■	■■□□	□□□□	90 - 120	90 - 130	61
Sunflower		■■■■	■■□□	□□□□	20 - 30	50 - 70	-



Fertilisation according to local recommendations.

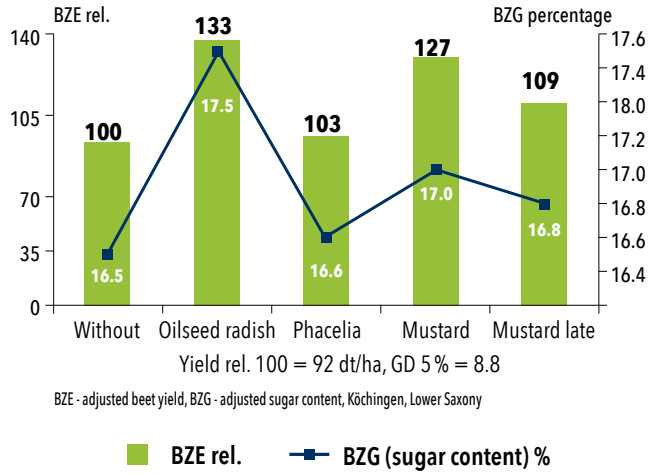
EXPERTS against Beet Cyst Nematodes



Sugar beet cyst nematodes cause yield loss

Sugar beet cyst nematodes (*Heterodera schachtii*) are still among the most economically important pests of sugar beets. Therefore, controlling these nematodes in affected areas must be a high priority. Particularly in tight sugar beet rotations, resistant cover crops help to suppress nematode populations below the damage threshold and create optimal growing conditions. Even when tolerant sugar beet varieties are cultivated, resistant cover crops not only reduce nematode populations but also sustainably promote beet and sugar yields, thereby increasing the profitability of sugar beet cultivation.

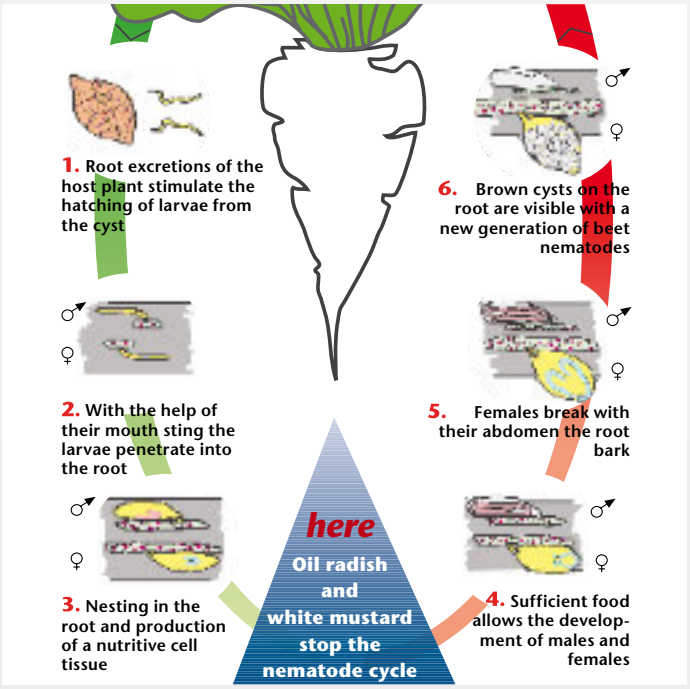
Impact of cover crops in sugar beet crop rotations



Source: dlz agrarmagazin, June 2010

Resistant oilseed radish and yellow mustard stimulate the hatching of larvae and their migration into the roots.

However, in contrast to host plants, the formation of the nutrient cell system is limited in resistant plants. The nematode cannot feed sufficiently, and a large proportion dies at an early stage. Since females require about 40 times more food than males during their development, the sex ratio in resistant plants shifts in resistant plants to 100 (up to 1000) males to 1 female. The lack of females leads to a population decline.



Resistant cover crops are classified according to their reproduction rate (final population / initial population) into resistance classes. Resistance level 1 represents a reduction of more than 90% (reproduction rate <0.1). Plants that can serve as host plants for the nematodes multiply the nematodes about 4-fold in the same period. Among plants that are not host plants (neutral plants, e.g., Phacelia or saia oats), the nematode population decreases by about 30 percent annually.

The cysts of beet nematodes can survive in the soil for more than 10 years and are found in deeper soil layers. In addition to beets, host plants include many cruciferous plants (rapeseed, mustard, radish, false flax, cabbage, cress, and spinach) as well as many weeds.

Even after more than 40 years of using resistant cover crops in practical cultivation, resistance-breaking nematodes have not developed, even under stress conditions. In addition to comprehensive resistance, the promotion of antagonistic fungi is also part of the biological nematode control.

How to find the right variety?

Feature	White mustard	Oilseed radish
Sowing time		
Early		Use varieties with low flowering tendency
Medium	Use varieties with low flowering tendency	All types are growing well
Late	Use varieties with medium flowering tendency	Use varieties with fast early development and medium flowering tendency

White mustard is very sensitive to day length and should not be sown too early. However, it can still form good stands when sown late, even into the second half of September. Good initial development not only ensures weed suppression through dense stands but also creates good soil tilth and evaporation protection for the soil.

Nematode control		
Beet Cyst nematodes	Well suited for medium and low BCN infestation	Stronger nematode reduction due to better resistance and deeper rooting
Stem and Bulb Nematode (*Ditylenchus dipsaci*)	Avoid White mustard	No multiplication of *Ditylenchus dipsaci*
Sugar beet- potato - rotation	Avoid White mustard	Muli-Resistant Oilseed radish

Oilseed radish also reaches deeper soil layers and reduces nematode infestation there. It also strongly promotes the natural antagonists of beet cyst nematodes. Only with oilseed radish can other nematodes and diseases be specifically reduced (see other nematodes and diseases, page 54).

Drought tolerance		
	White mustard is more drought-tolerant and able to build up a lot of biomass even with limited water supply	Oilseed radish has a higher water use efficiency due to their better leaf-root relation
Nutrients		
	White mustard can also form dense stands under nutrient-poor conditions	Oilseed radish can absorb a lot of nitrogen in a very short time and protect it from leaching
Frost tolerance/Mulch seeding		
	White is not frost-hardy. Varieties with better standing ability dry out better and are more suitable for mulch and direct seeding.	Varieties with lower winter hardiness and those that have developed to flowering freeze more easily.

QUALITY IS OUR P.H.PETERSEN TOP PRIORITY

Ensures dense and gap-free stands and actively contributes to the reduction of weed pressure.

EXPERTS against nematodes

Nematode-resistant white mustard

- Tested in France and allocated to resistance level H1 (over 90% reduction in sugar beet nematodes)
- Extremely late flowering allows early sowing without seed formation
- Easy sowing, fast ground cover and long vegetative growth phase

- Newly listed
- Specialist for controlling nematodes in beet crop rotations
- Especially suited to sowing from early August

- SCOUT exhibits fast initial development, offering good tolerance to late sowing with effective weed suppression
- Delayed flowering onset for a long, vegetative growth period with effective nematode control

- Combination of rapid initial development and late flowering ensures a long period of nematode control
- Reliably freezes off over winter and leaves optimal conditions for mulch sowing

- High late sowing tolerance due to rapid initial development: good stands can still be achieved with sowing dates up to mid-September
- Weeds are effectively suppressed and valuable nutrients are organically protected from being transferred to deeper soil layers

- Long vegetative growth ensures good rooting
- Good standing powery for soil-friendly mulch seeding
- ABDATE is the update for modern cover crop mustard cultivation

VETO

Objection to nematodes

- Leafy development for effective weed suppression, good soil shading and promotion of soil fertility
- VETO forms organic matter from freely abvailable nutrients to improve the humus balance

CLINT

A resounding success

- Fast initial development ensures good tolerance to late sowing with effective weed suppression
- Good biomass can still be achieved when sowed up to mid September

ACCENT

Well-known and well-valued

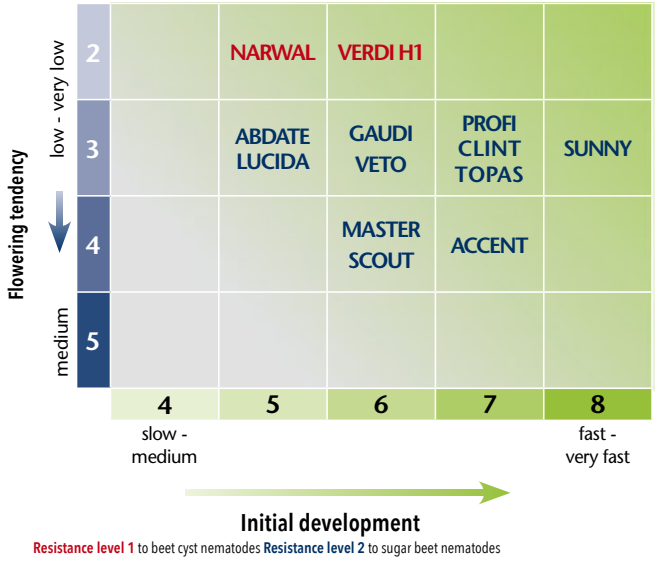
- Up to 90% reduction of nematodes in official tests - resistance level 2
- Quick and easy sowing, rapid and complete ground cover

PROFI

The professional before beets

- Generous ground shade intensively promotes weed suppression and tilth formation
- Late flowers for long vegetative development and long-lasting hatching stimulation

Nematode-resistant white mustard overview

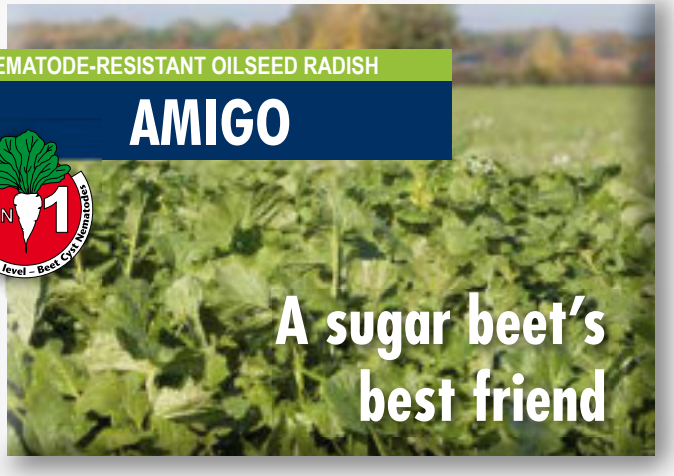


Source: data based on NL Germany 2025 and related trials

Variety	Profile
GAUDI	A pleasure before sugar beet
LUCIDA	Extremely late bloomer
MASTER	Suitable for late sowing and easy to establish

EXPERTS against nematodes

Nematode-resistant oilseed radish



- Highest level of resistance: encourages beet cyst nematodes to hatch and actively reduces the population to under the damage threshold
- Also suitable for late sowing up to early September
- Rapid development increases sensitivity to frost
- Dense root system fixes nutrients and prevents leaching into deep soil layers

- Fast ground cover for reliable weed suppression
- Delayed flowering offers flexibility regarding sowing time
- Strong root penetration of the soil and good nutrient storage offer optimal conditions for the following crop
- AGRONOM controls beet cyst nematodes and Corky Ringspot Syndrom in potatoes

- Strong initial development for quick ground cover and use of remaining heat units
- Forms large amount of mass thanks to long vegetative growth phase
- Intensive root penetration for good tilth

- New listed
- Pronouced vegetative development for intensive rooting
- Leafy, compact growing for dense ground covering and good protection against erosion

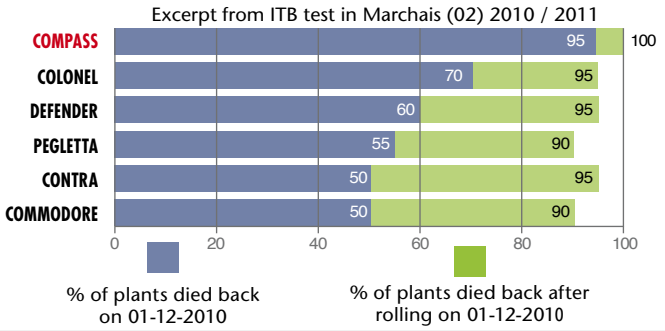
NEMATODE-RESISTANT OILSEED RADISH

COMPASS

Due to the low winter hardiness of COMPASS, a very high percentage of the plants freeze off during winter. The remaining plants can be destroyed cost-effectively by rolling the crop on frozen ground in a process that is both soil-friendly and environmentally-friendly. A clean field in spring proves good weed suppression.

- Resistance level 2, freezes off more easily and faster than traditional oilseed radish varieties
- Fast soil warming in spring due to the low mulch layer allows early sowing of sugar beet and maize
- No additional work or costs required to work in - ideal for mulching and direct sowing of following crop

Sensitivity to frost



SUNDAY

Cold-tolerant and extremely late-flowering

- Low-growing for less work with the flail mower
- Ideal for long-term retention of nutrients over winter
- Deep roots thanks to extremely long vegetative growth phase

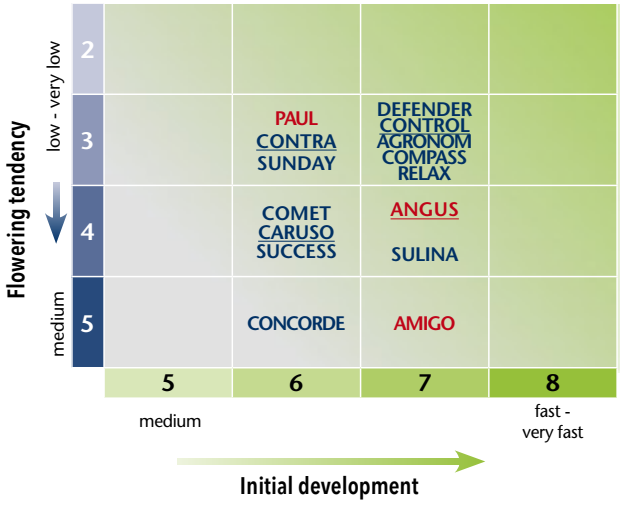
SUCCESS

Successful beet cultivation

- Good weed suppression and robust initial development
- Strong root penetration with reserved flowering tendency
- Fixes nutrients in the topsoil

Variety	Profile
RELAX NEW	**Resistant and higher frost susceptability**
COMET	**High performance against beet cyst nematodes**
CONCORDE	**Promotes beet yield and quality**

Nematode-resistant oilseed radish overview



Resistance level 1 to beet cyst nematodes
Resistance level 2 to beet cyst nematodes
Underlined varieties also tackle *Meloidogyne chitwoodi*

Source: data based on NL Germany 2025 and related trials

EXPERTS against diseases and pests

Multi-resistant oilseed radish

Convinces wordwide with positive results in practice

MULTI-RESISTANT OILSEED RADISH

DEFENDER

Resistances:

- Disrupts disease cycles in vegetable, potato, sugar beet and cereal crop rotations
- Up to 90% reduction of beet cyst nematodes (resistance level 2+)
- No multiplication of stem nematodes (*Ditylenchus dipsaci*)
- Reduces Corky ringspot syndrome in potatoes
- Efficient reduction of root-knot nematodes and free-living nematodes

Agronomic properties:

- Strong initial development and rapid ground cover for effective weed suppression
- Deep-reaching, fine root system improves soil structure

- Multi-resistant origin: selected from DEFENDER
- Resistance to beet cyst nematodes in the upper area of level 2
- Officially confirmed resistance to root gall nematodes
- No multiplication of stem and bulb nematodes, reduces Corky Ringspot syndrome
- Encourages positive soil life
- Worsens survival conditions for Rhizoctonia
- Medium frost susceptibility for long-lasting nutrient binding and soil protection
- Strong vegetative growth with intense root formation

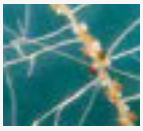
CARUSO

Exceptional before potatoes

- Effective control of various nematodes and diseases e.g. *Heterodera schachtii* and root-knot nematodes
- Rapid ground covering for effective suppression of volunteer growth and weeds
- Fast, healthy initial development, increases organic substance and supports soil fertility

Variety	Profile
CONTRA	**The specialist for vegetable crop rotations**
ANGUS	**The multi-resistant powerhouse**

Overview: Effectiveness of cover crops against nematodes and diseases



Beet cyst nematodes
- Over 90% reduction of *Heterodera schachtii* possible
- Controlling of *Heterodera betae*
- No development of resistance-breaking nematodes
- Controls even in deeper soil layers

Root-knot nematodes
- Officially tested resistance to *Meloidogyne chitwoodi*
- Prevents the development of *M. fallax*
- For crop rotations with potatoes, vegetables and flower bulbs

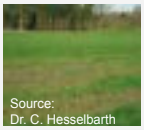
Northern root-knot nematodes
- Efficient control of *Meloidogyne hapla*
- For organic crop rotations with high clover growing frequency and carrot farming
- Also protects potatoes and sugar beet

Corky Ringspot syndrome
- Reduces Corky Ringspot syndrome (Tobacco Rattle Virus) in potatoes
- Suppresses free-living *Trichodorus* nematodes that spread the virus
- Reduces weeds through rapid ground cover

Rhizoctonia rot
- Reduction of yield and quality issues caused by Rhizoctonia
- Controls root-killing disease and dry-core in potatoes
- Controls Rhizoctonia in beets
- In lettuce, cabbage and many other cultures including maize, grass, beans and flowering bulbs
- Promotes structure, pore volume and aeration of the soil
- Encourages natural antagonists

Southern root-knot nematodes
- *Meloidogyne incognita* and *M. javanica* are effectively reduced
- In greenhouses and in peppers, tomatoes and pumpkins

Stem and bulb nematodes
- No multiplication of *Ditylenchus dipsaci* as a cover crop
- For crop rotations with beets, vegetables and flower bulbs



Lesion nematodes
- Poor host plants for *Pratylenchus* nematodes
- On sandy soil as a cover crop
- For crop rotations with potatoes, rapeseed, cereals, vegetables and flower bulbs

Pythium
- Reduces damage caused by *Pythium* fungus
- In crop rotations with peas, potatoes and flower bulbs

Clubroot
- No build-up of the clubroot pathogen *Plasmodiophora brassicae* when grown as a cover crop in crop rotations with oilseed rape and cabbage

Cereal crop rotation diseases
- Good disruption of the disease cycles in cereal crop rotations (e.g. take-all (*Gaeumannomyces graminis*)

Preceding crop impact of various cover crops:

	Sugar beet		Potatoes						Rapeseed
	Heterodera schachtii	*Ditylenchus dipsaci*	*Rhizoctonia*	*Trichodorus spp.*	*TRV*	*Pratylenchus spp.*	*Meloidogyne chitwoodi*	*Meloidogyne hapla*	Clubroot
Oilseed radish	Varieties				Varieties		Varieties	Varieties	Frequency
Tillage radish									
White mustard	Varieties								
Brown mustard									
Forage rape									
Turnip rape									
Saia oat									
Ryegrass									
Forage rye									
Phacelia									
Buckwheat									
Berseem clover									
Persian clover									
Common vetch									
Blue lupin					Varieties				
Flax									
Sunflower									

Legend: positive | neutral | negative | no information available | Varieties react differently

EXPERTS for soil and crop health

Other nematodes and diseases

Besides beet cyst nematodes, other nematodes are increasingly causing problems. Crop rotations with a high proportion of root crops and vegetable cultivation are particularly affected. Mult-resistant oilseed radish varieties not only reduce beet cyst nematodes but also other nematodes and have furthermore been tested for their control effect against many crop rotation diseases.

The cultivation of cover crops must be carefully considered to ensure that the cover crop species and varieties used do not exacerbate pest pressure and thus jeopardize the success of the subsequent crop. Declining chemical control options and warmer climatic conditions are intensifying the problem. Crop rotation planning, cultivation, and field hygiene are the basis for successful pest management.

Trichodorus and Corky Ringspot syndrome

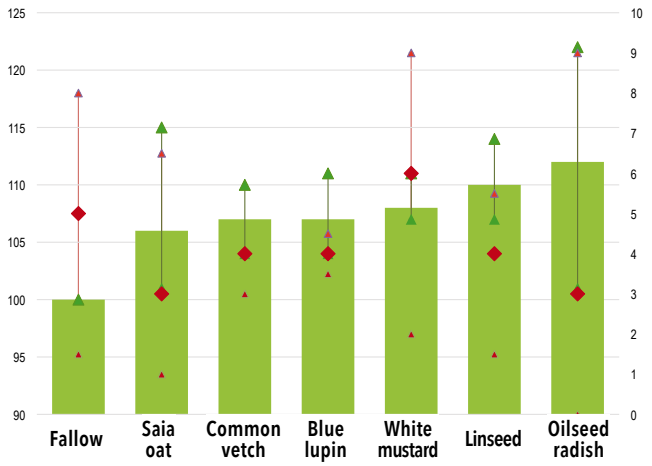
As free-living nematodes, Trichodorids are very difficult to control directly because the animals can also be found in deep soil layers and attack the plants again from there. So far, only rough classifications for the host plant status of plant species can be made here. It is important to promote the initial development of the main crops through optimal growth conditions so that they can quickly develop out of the sensitive juvenile phase.

However, cover crops can reduce the transmission of Tobacco Rattle Virus, which causes spraing (corky ringspot). In particular, the cultivation of oilseed radish has established itself as a very effective measure here. The Trichodorus nematode loses the virus through the cultivation of a suitable cover crop and can no longer spread spraing.

Since many weeds and volunteer potatoes also provide opportunities for the nematodes to re-infest themselves with the virus, these agronomic measures are the basis for control. Rapid soil cover and good weed suppression by the cover crops support these measures.

Impact of various cover crops on potato yield and Corky Ringspot syndrom

(private trial carried out by LWK NRW)



Potato yield, relative (2017: 67.7 t/ha, 2018: 54.8 t/ha)

Highest and lowest yield

Proportion of potatoes affected by Corky Ringspot syndrome (%)

Highest and lowest infestation

Our variety recommendation as cover crops to control Corky Ringspot syndrome

For intensive crop rotations with potatoes, sugar beets and vegetable: Oilseed radish, multi-resistant :
DEFENDER, ANGUS, CONTRA, CONTROL, CARUSO

For crop rotations with potatoes and sugar beets:

Oil radish, resistant to beet cyst nematodes:
COMPASS, AGRONOM

For crop rotations with potatoes:

Oil radish, conventional:
SILETTA NOVA, BENTO

Other cover crops (Blending partner for oilseed radish): Linseed, Saia oat PRATEX and CODEX, common vetch and blue bitter lupine.

Root-lesion nematodes *(Pratylenchen ssp)*

These migratory root nematodes are frequently found on light soils and can lead to significant yield losses in potatoes, vegetables, and also cereals. They usually occur in patches. Affected plants remain stunted in growth and are more quickly infested by fungal diseases such as *Verticillium* and *Fusarium*.

To reduce Pratylenchus, the French marigold (*Tagetes patula*) is an absolute specialist that actively combats the nematodes by excreting thioterpenes. After successful cultivation of *Tagetes patula*, the population only recovers slowly; the control measure has an effect for several years. However, sowing should take place in June with special sowing equipment and is relatively expensive. Since Tagetes increases virus-induced spraing, its use for potato farmers is only a limited option.

Instead, the cultivation of Saia oat is a practical compromise. Saia oat do not multiply Pratylenchus penetrans, reduce spraing, and is an uncomplicated cover crop that also suppresses weeds, which are alternative hosts for the nematodes, with the abundantly formed leaf and root mass, and stimulates positive soil life.

Multi-resistant oilseed radish is also a poor host plant for Pratylenchus. In case of an infestation with root-lesion nematodes, special attention should be paid to the components of seed mixtures: even small proportions of host plants can be used by the nematodes for mass reproduction and endanger the yield.

Root-knot nematodes *(Meloidogyne chitwoodi, Meloidogyne hapla)*

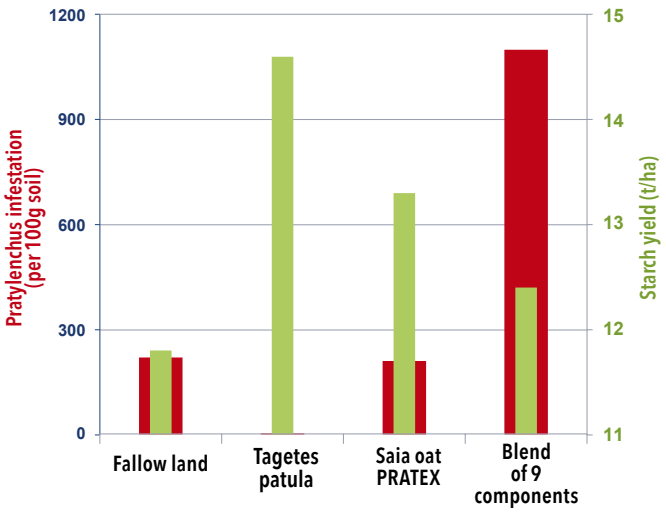
The Columbia root-knot nematode (*Meloidogyne chitwoodi*) has an immensely large host plant range and should not be underestimated, as it is a quarantine disease in Europe.

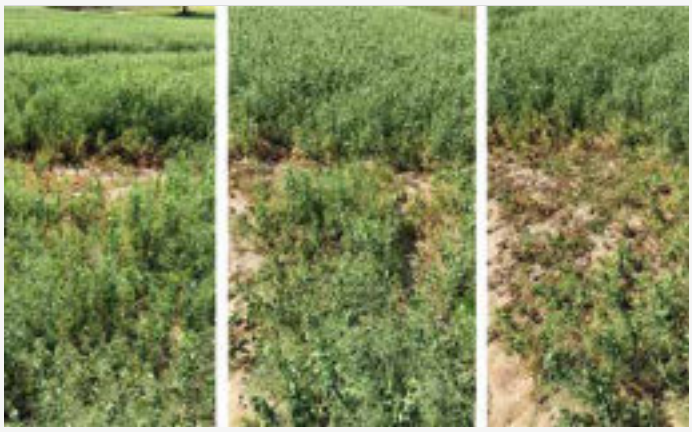
Currently, high-performing oil radish varieties are available that can reduce infestation to below the detection limit. The oilseed radish DEFENDER was selected in the EU project DREAM (Durable Resistance Against Meloidogyne) and was the first oil radish to reduce this quarantine pest. Meanwhile, this characteristic is checked upon request in the official variety trials in Germany and the Netherlands and documented in the variety lists. Take the opportunity to regulate this pest at the same time by using a multi-resistant oilseed radish variety! Oilseed radish varieties with resistance to *Meloidogyne chitwoodi*: ANGUS, CARUSO, CONTRA, CONTROL, DEFENDER and JERSEY (NEW).

The Northern root-knot nematode (*Meloidogyne hapla*) only infests dicotyledonous plants. Since legumes are good host plants, this pest is very common in organically farmed soils. In addition to consistently avoiding dicotyledonous plants, the oil radish varieties CONTRA and ANGUS can also suppress this nematode.

Both root-knot nematodes need host plants to survive. Suitable and targeted cover crop cultivation can almost completely eliminate infestation.

Impact of cover crops on *Pratylenchus penetrans* and potato yield
(PPS GROEN, Valthermond 2016-2017)





Damage in winter peas caused by Root lesion nematodes

Rhizoctonia

The fungal disease *Rhizoctonia* causes damage and yield losses in potatoes, sugar beets, field beans, and soybeans.

Rhizoctonia is divided into different host ranges (anastomosis groups). Sugar beets, legumes, maize, and grasses are primarily affected by group AG 2-2, while potatoes are mainly affected by AG-3 and a more general group (AG-4), which, however, causes less significant damage.

Common to all *Rhizoctonia* groups is that they are favoured by waterlogging and soil compaction, narrow crop rotations, and a lot of undecomposed, lignin-rich organic material.

Besides the susceptibility of species and varieties to the *Rhizoctonia* fungus, the proportion in a mixture is a crucial criterion for the occurrence of the disease.

Cover cropping that promotes root penetration and soil aeration worsens the survival conditions for the fungal disease. Furthermore, many cruciferous plants used as cover crops have a direct reducing effect on *Rhizoctonia* due to their extensive root system and sulphur-containing compounds.

Clubroot

A particularly important and serious disease in winter oilseed rape cultivation is clubroot (*Plasmodiophora brassicae*). Clubroot belongs to the slime moulds and infests the roots of plants in the cruciferous family, on which root thickenings (hernias) form. Clubroot can survive in the soil for up to 20 years and can mean total crop failure for winter oilseed rape.

If oilseed rape is grown on clubroot-infested areas, cruciferous plants should be avoided as cover crops, as they can further escalate the infestation situation. Besides white mustard, brown mustard, and fodder rape, camelina and cress also belong to the cruciferous family. Oilseed radish is far less susceptible than the other cover crops from the cruciferous family, but even oil radish should only be used as a cover crop in wide oilseed rape rotations without a previous clubroot infestation. The oilseed radish variety with the demonstrably lowest infestation of clubroot is DEFENDER.

Using non-host cover crops like phacelia, saia oats, linseed, and legumes prevents the worsening of clubroot.

Conclusion

Controlling specific nematodes and diseases requires targeted cultivation management, as nematodes rarely occur as single groups but rather as a mixture of several. To effectively reduce diseases with cover crops, precise knowledge of the nematode infestation in the soil is helpful. The best time for soil sampling is during cool and moist periods (typically November to February). In warm and dry conditions, free-living and migratory root nematodes retreat to deeper soil layers and cannot be detected. If Pratylenchus is suspected, it is advisable to also send in plant roots for analysis, as the nematodes can overwinter there. Many agricultural offices conduct nematode investigations. Some independent laboratories in the Netherlands have also specialized in soil samples before potatoes.

If the primary goal when choosing a suitable cover crop is the reduction of nematodes and diseases, it is generally advisable to limit oneself to a few species. Within these species, the immense progress in breeding should be utilized. Agronomic characteristics such as rapid initial development, suitability for late sowing, or reliable dieback from frost can also help to improve control. Species-rich mixtures increase the risk of nematodes and diseases multiplying strongly on individual components. Therefore, it is important to use them only where no sensitive subsequent crop follows.

EXPERTS against Corky Ringspot

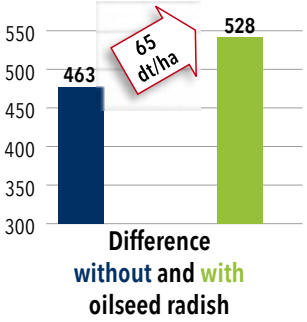
OILSEED RADISH

SILETTA NOVA

Also available as an organic product

More yield with oilseed radish
(Kartoffelberatung LWK NRW, Kanders+Beerendonk, 2004 - 2019)

Potato yield, TM in dt/ha, middle of 6 series



Crop rotation

1st year	Silage maize	Silage maize
2nd year	Winter wheat	WW + oilseed radish
3rd year	Potatoes	Potatoes

- Reliable and tested for quality potatoes
- SILETTA NOVA alleviates virus transfer by Trichodorus nematodes
- Rapid and especially leafy ground shade suppresses weeds that the virus could use to multiply
- The deep root system creates optimal soil conditions and reduces soil compaction
- SILETTA NOVA contributes to long-term, sustainable potato yields

Oilseed radish	Profile
BENTO	**Promotes potato quality and yield**

Sticky nightshade (*Solanumsisymbriifolium*) against potato cyst nematodes (PCN)

Sticky nightshade is resistant to *Globodera rostochiensis* (pathotypes 1 to 4) and *Globodera pallida* (pathotypes 2 and 3) and is part of the *Solanaceae* family (nightshades). Best control with early sowing dates (mid May to mid July).

WHITE STAR

Dense root penetration to control *Globodera*

DIAMOND

Strong growth and strong control

EXPERTS against Root Lesion Nematodes

SAIA OAT

PRATEX

Also available as an organic product

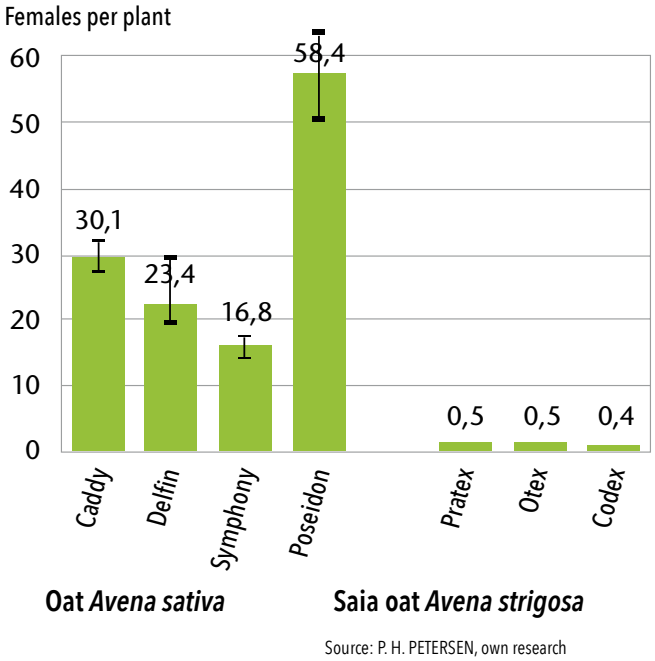
- Controls lesion nematodes (*Pratylenchus penetrans*) without any multiplication of Trichodoridus species
- Sowing: As a cover crop with a seed drill
- Very rapid initial development and good competition against weeds (allelopathy) that could be potential multipliers for Pratylenchus
- High production of organic mass, dense root penetration of soil
- Cover crop that freezes off well

Saia oat (*Avena strigosa*) is a commonly used cover crop thanks to its undemanding nature. Grown for nematode reduction, erosion protection, as a biomass producer or in cover crop blends, it covers a large range of needs.

Especially in light soil, damage caused by *Pratylenchus* can lead to considerable quality and yield losses. Not only the nematodes themselves damage the plants, but they also enable fungi such as *Fusarium* and *Verticillium* to easily access the plants. The large number of possible host plants includes both cultivated crops and weeds, which makes control even more difficult. PRATEX has proven its suppression skills in many tests and in practical planting. New saia oat varieties CODEX, TRADEX and OTEX also reduce *Pratylenchus penetrans*.

New knowledge from research: unlike standard oat varieties, PRATEX, OTEX and CODEX reduce cereal cyst nematodes (*Heterodera avenae*).

Breeding of cereal cyst nematodes
(Heterodera avenae)



Source: P. H. PETERSEN, own research

CODEX

The late saia oat

- Long vegetative growth phase through late ear emergence
- Fine root network with mycorrhiza formation

OTEX

Strong initial development

- Flexible use - as green manure and for fodder production
- Rapid soil coverage and weed suppression

Variety	Profile
LUNEX	**Green manure or fodder**
TRADEX	**The yielding one**

EXPERTS for green manuring

- Tried-and-tested by many farmers: convincing growing - even when sown late and in unfavourable soil conditions
- Extraordinary rapid initial development for effective weed suppression

INFORMER NEW

Boosts soil life and protects from erosion

- Flexible sowing thanks to low flowering tendency
- The organic matter vitalises soil activity, keeps nutrients in the topsoil and provides valuable humus

Variety	Profile
AKIRO	Robust and fast
GALLIUS	Promotes soil fertility

Tillage radish

- Leafy initial development and low growth height
- Binds freely available nitrogen in autumn and prevents leaching
- Radish dies off and rots over winter
- The roots form large holes in the soil, encouraging spring soil warming.

MINER

Forms taproots to aerate soil

Abyssinian cabbage/ Ethiopian mustard

- Robust and healthy gowing
- Late flowering, long vegetative growing time
- No seed building in autumn, not winter-hardy

White mustard for soil covering

- Especially long vegetative growth for more organic matter
- Allows sowing from August into autumn without seed formation or woody growth
- Recommended for water conservation areas, mulch sowing and agricultural blends

- Secure freezing off in winter - plant residues provide good erosion protection even after dying off
- The nutrients conserved in the organic matter are protected from erosion during winter and are available in the following spring
- Tried and tested for trouble-free mulch sowing - especially in maize rotations

ASCOT

Soil revitalisation and erosion protection

- Rapid early development makes late sowing dates possible
- Tolerant to drought, not winter-hardy

COVER

Rapid initial development

- Strong initial development allows late sowing
- Effective weed suppression and reliable protection against erosion and nutrient loss over winter
- Freezes off safely

Brown mustard *(Brassicajuncea)*

High levels of special glucosinolates in the leaves and grains make this species (*Brassica juncea*) excellently suited to use in biofumigation to combat soil-bound diseases. Also used to make mustard products for human consumption.

TERRAFIT

Fast-growing

- Fast early development und growing, early start of flowering
- Very high active substance content
- Dark seeds

TERRAPLUS

Late flowering

- Extensive vegetative development
- High biomass production
- Dark seed colour

ENERGY

Multifunctional

- Fast initial development, medium-early flowering
- High levels of isothiocyanates released
- Multi-coloured seeds

Forage rape *(Brassicanapus)*

Forage rape is a tasty fodder for cattle. It offers very good green matter and dry matter yields with a high protein content. As green manure, the organic matter helps humus formation and promotes optimal soil quality. A high capacity to bind nutrients makes both winter and summer forage rape an excellent species for water protection. The network of fine roots covers large areas of soil, stabilising soil structure and promoting air exchange within the soil.

- Free of erucic acid and glucosinolates
- Favourable leaf/stalk ratio
- Withstands light frosts
- Good stability

- Early fodder reserve
- High-quality protein fodder
- Fast ground cover as erosion and nutrient protection

Winter forage rape
EMERALD

Tasty and high-yield

- Highly digestible quality fodder
- Effective green manure

Winter forage rape
PRESTIGE 00

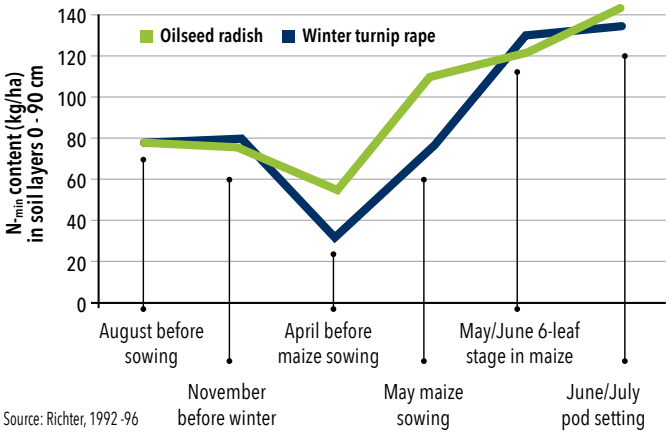
Valuable for trough and soil

- Fast-growing and leafy
- Can be sown early or late

Winter turnip rape *(Brassicarapavar.silvetris)*

As a winter-hardy green manure for erosion protection and nitrate binding with dense root penetration and a high potential for nitrate return to the subsequent crop. It can be cut or grazed off.

Nitrogen storage and release: a comparison of oilseed radish and winter turnip rape



Source: Richter, 1992 -96

- Suitable for late sowing up to mid September
- When sown early, can first be used after 6-8 weeks
- High nutrient uptake capacity
- Effective water protection measure

Phacelia *(Phaceliatancetifolia)*

As a neutral plant for beet nematodes and clubroot, phacelia is a suitable cover crop for beet crop rotations with rapeseed. In all crop rotations, phacelia impresses with its undemanding nature and drought tolerance. As a popular pasture plant for bees, it improves the landscape when sown alone or as part of a floral blend, then reliably freezes off and protects the soil from erosion damage.

- High-yielding honey plants, can be used to fill
  the summer gap
- Leaves an easy-to-work and dark fine-stemmed mulch layer in spring that promotes soil warming
- Additional organic substance stabilises the soil's humus content
- Unlocks organically bound phosphorus

AMERIGO

Drought-tolerant, dense growth

- Low requirements for soil type and water supply

Marrow stem kale

Marrow stem kale is used for cattle fodder, on gameland and in winter-hardy cover crop blends.

- Very high mass yield with balanced leaf ratio
- High vitamin, nutrient and protein content
- Reliable basic feed through to autumn

Variety	Profile
CAMARO	**For fodder and gameland**
ANGLIAN GOLD	**Exceptional frost resistance**

Linseed *(Linumusitatissimum)*

This traditional plant for oil production is also excellently suited to growing as a cover crop. Linseed is a fine-seeded, neutral plant in cover crop blends. It has deep root penetration and can develop silicon as a nutrient for the subsequent crop.

JULIET

Fine and drought-tolerant

- Easy and reliable cover crop
- Established plants are frost-sensitive

ZOLTAN

Easy-going and stable

- Fine taproots that grow deep into the soil
- Good support plant for climbing legumes
- Striking flowers enhance the blend

Buckwheat

Buckwheat provides fast ground cover and good weed suppression. Buckwheat freezes off over winter safely. Fast flowering and seed maturation allow for grain production, meaning this plant deserves particular recognition as a cover crop.

Common buckwheat *(Fagopyrum esculentum)*

- Suitable as a fast-growing cover crop or to produce grain
- Rapid initial development and ground cover with exceptional weed suppression
- Can make organically stored phosphorous available to plants
- Low requirements for soil quality and nutrients

HAJNALKA

Robust and neutral regarding subsequent crop

- Is valuable for honey bees and is often used in wild forage blends
- Fast growing, susceptable to frost

Sorte	Profil
ESQUIRE NEW	Late-maturing

Tartary buckwheat *(Fagypyrum tataricum)*

Tartary buckwheat flowers significantly later than common buckwheat and contains bitterns.

TABEA NEW

Extremely late-flowering

- Fast-growing and leafy for effective ground cover
- Not winter-hardy

Sorte	Profil
TABOR NEW	Neutral for crop rotation diseases

Legumes as cover crop

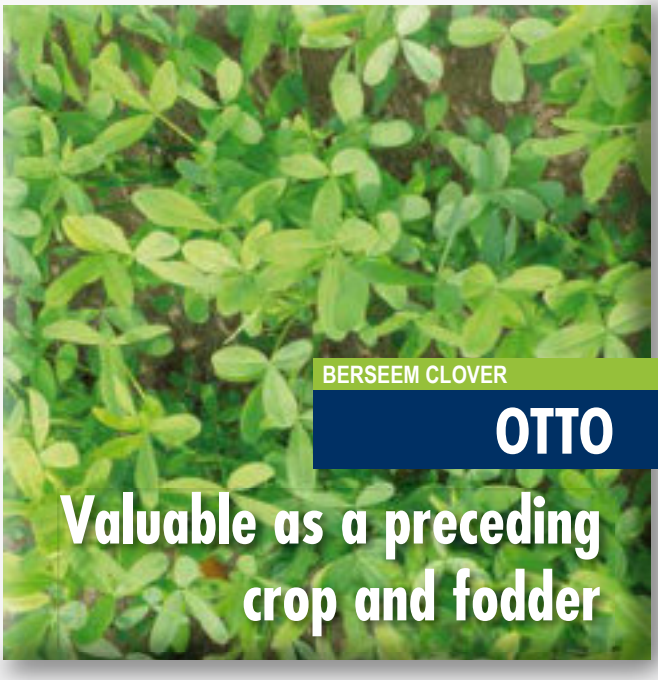
EXPERTS

Legumes have the ability to enter into a symbiosis with rhizobia, utilising nitrogen from the atmosphere for plant growth. This means that legumes provide any crops with additional nitrogen. Properly used, this reduces the need for mineral fertiliser and its energy-intensive production as well as increasing the subsequent crop's N-elasticity. To maintain plant health, a sufficient cultivation distance must be ensured in crop rotations with legumes as the main crop.

Legumes are a very diverse group. We are constantly working to expand our range. If you can't find your preferred legume over the following pages, don't hesitate to contact us.

Clover

These annual clovers are low-maintenance and have fine seeds. With rapid development, these clovers cover the middle to deep layers of blends, and actively contribute to the nitrogen supply. Clover flowers are also attractive nectar sources for honey production.



Persian clover *(Trifolium resupinatum)*

FELIX

For main and cover crop cultivation

- FELIX provides very tasty and protein-rich green fodder and silage
- Dense crops that freeze off reliably for soil protection and improvement

Balansa clover *(Trifolium michelianum)*

Frost-sensitive Balansa clover is a low-maintenance blend partner with an especially small thousand kernel weight.

Berseem clover *(Trifolium alexandrinum)*

- Ideal properties for green manure and fodder production
- OTTO is multicut and withstands gentle frosts down to -6°C

Fava bean *(Viciafaba)*

Fava beans are impressive cover crops with great value as preceding crops: on one hand, broad beans fix nitrogen through symbiosis with rhizobia bacteria; on the other, their strong taproots break up compacted soil and improve soil structure with their high root mass.

- Very low thousand kernel weight (300 - 350 g) allows a shallow sowing depth and sowing with other cover crops in a blend
- Also suitable for intersowing with winter rapeseed (see page 54)
- High N binding through symbiosis with rhizobia bacteria
- Strong taproot with high root mass for dense root penetration and improvement of soil structure
- Large rounded leaves for good weed suppression and encouraging tilth

ATLANTIS NEW

Radically reduced grain size

- Thousang kernel weight only ~180g
- Black-seeded

Blue lupin *(Lupinusangustifolius)*

Blue lupins have a TKW about 160-200g and are pioneer plants because of their marked taproot. A symbiosis with root nodule bacteria also encourages soil fertility. As well as nitrogen, lupins are also good at absorbing potassium and phosphorus.

- Ideal plant for green manuring that can bind nitrogen in its root knot
- Can grow regardless of soil's nitrogen content and also provides neighbouring plants in the blend with the nutrient for growth
- Very valuable preceding crop

Field peas *(Pisumsativum)*

Field peas also grow in dry conditions, are more robust than protein peas and provide more biomass. When combined with other plants, field peas use any free space to suppress weeds and take advantage of light.

RUBIN

Summer field pea

- Rapid growth and very stable
- Attractive, colourful-flowering legume with small seeds
- Ample, deep root system encourages soil life

NS PIONIR

Winter field pea

- Especially small seeds (field peas)
- Winter-hardy as an addition to cereal blends
- Valuable fodder and green manure plant

Vetchling/Peavine *(Lathyrussativus)*

Robust summer legumes with lots of biomass and a great ability to accumulate a lot of nitrogen within a short time. Reliably freezes off.

ETERNA

For biodiversity and soil fertility

- Colourful flowers for insect enrichment
- A valuable partner in blends and as a companion plant to oilseed rape

Sainfoin *(Onobrychisviciifolia)*

Sainfoin is a perennial nitrogen fixer. The roots penetrate to great depths and pull nutrients up from the subsoil. Sainfoin has been found to increase the sequestration of nutrients such as phosphate. It is the ideal crop to sow ahead of cereals or brassicas in the rotation.

Serradella *(Ornithopussativus)*

Serradella is a legume used for green manure as well as wild forage and as a meadow plant. Serradella's dense, fine root system contributes to soil loosening and therefore soil improvement. This protects the soil from drying out and stops nutrients being washed away.

Vetches

Vetches are excellent fodder plants and blend partners. They produce better and are healthier when grown together with support crops. The multitude of vetch species contributes to biodiversity. In blends, they contribute to the nitrogen supply of their non-legume partners.

Common vetch *(Vicia sativa)*

- Voracious grower, compact growth and reliable protein provider
- Partner for peas and oats as well as rye

NEON

Resistant and high-yield

- Resistant to *Aphanomyces euteiches* (blackleg in pulses)
- Ideal for producing fodder containing protein as it has the highest dry mass yield

Winter vetch *(Vicia villosa)*

- Extremely winter-hardy, secure establishment in autumn
- Exceptional development in spring and good ground cover
- Vigorous grower with good, protein-rich dry mass yields

LATIGO

Excellent for green manuring and fodder

Crimson clover *(Trifoliumincarnatum)*

Winter-hardy crimson clover is ideal in grassy blends for biomass production. Through symbiosis with Rhizobiaceae, crimson clover delivers additional nitrogen, penetrates the soil densely with its roots and is therefore an excellent and impactful preceding crop.

Alfalfa *(Medicagosativa)*

This deep-rooting legume is known as the 'queen of forage plants', as it is persistent and winter-hardy. Ideal as a blend partner for protein-rich fodder or cover crop

Variety	Profile
PROTEUS	Protein-rich and fine-stemmed
POSEIDON	Versatile and high-yield
LINSEY NEW	Dormancy 4-5 - ideal for North Europe climate
LEAFY NEW	Dormancy 6.5 - more leaves, more protein

Cereals as cover crop EXPERTS

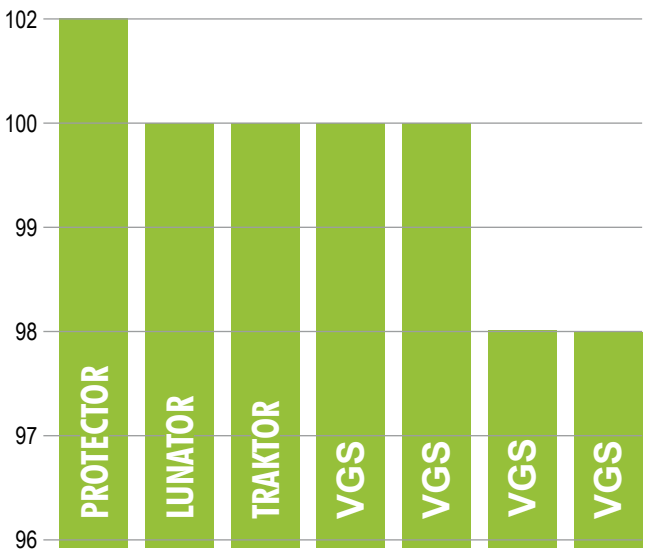
Winter forage rye *(Secalecereale)*

Forage rye is an excellent addition to biomass crop rotations areas with good water supply. Forage rye is suitable for use in fodder and biogas production. In comparison to grain types of rye forage rye tillers more strongly, has a more leavy and faster early development and is extremely cold tolerant.

- Longstanding number 1 in German evaluations
- Biomass and fodder provider with excellent return on invested time
- Double usage: for cattle and biogas
- Excellent winter growth, exceptional erosion protection
- Very good tolerance to late sowing: up to late October for greening after maize

PROTECTOR - Top forage rye

Yield performance as average 2022-2024, 100% = 68 dt/ha)



- High biomass-yields early in spring - ideal as previous crop before maize sowing
- Low lodging tendency for clean mowing and minimal soiling of harvested goods for very good silage quality

TRAKTOR

Biomass and erosion protection

- High number of tillars and intensive ground cover in autumn offer good weed suppression and protection from erosion caused by wind and water
- Improved stability makes harvesting easier

SU VECTOR

High-yielding and stable

- high dry matter yield
- good stem stability enables fast and uncomplicated mowing

Perennial rye *(Secalemontanum)*

Perennial rye is not only suitable as a partner in wildlife feed blends, but also for producing grain for use in flavoursome, healthy baked goods.

JOHAN

Original and traditional

- Small grains and strong tillers
- Extremely winter-hardy and persistent
- Well suitable for game cover blends

Annual ryegrass *(Loliummultiflorum)*

Fast growing cover crop for additional forage production after cereal harvest. It can be used as fresh fodder, ensilaged or used in biogas plants. The dense roots provide additional organic matter to improve humus and stabilise the soil's structure. Also possible in undersowing or to regenrate the soil's humus content.

ALISCA

Tetraploid

- Medium late - very flexible harvest window
- High-yield and healthy

DIPLOMAT

Diploid

- Early and fast
- Upright growth for easy cutting

Spring forage rye *(Secalecereale)*

Also available as an organic product

OVID

Robust population rye

- Can be used as a main crop for grain production or as a secondary crop for biomass production
- Develops a good network of roots in the topsoil

SU VERGIL

Healthy population rye

- For use in cereal production and as a secondary crop
- Improved stability and heathy growing
- Rapid summer growth makes SU VERGIL suitable for use as a green manure to improve soil structure and organic matter if planted after a main crop

Spring triticale

SU CARL

Strong yield and high stiffness

- High performance in grain and dry matter yield
- Ideal for blends with fegumes due to high stiffness

EXPERTS in cover crop cultivation

Straw Management

Sowing of a cover crop begins at the harvest of the preceding crop.

Even straw distribution and short chopping lengths prevent gaps and volunteer cereal growth. High amounts of cereal straw tie up a significant amount of nitrogen during decomposition, which can lead to a temporary nitrogen deficiency. If fertilization is not possible and high demands are placed on the effectiveness of the catch crop (e.g., for nematode reduction), it is recommended to remove the straw.

Key Principle: If straw remains on the field, **good straw distribution**, **fine chopping**, and **ideally careful, deeper incorporation** are particularly important for the subsequent seed placement of the catch crop.

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Fertilization

An adequate nutrient supply is essential for the development of cover crop stands.

The proportion of basic nutrients, especially nitrogen, that the cover crop can utilize from the soil stock is determined by weather and agronomic factors. More information on nitrogen fertilization can be found on page 70.

Sowing Date

The sowing date of the cover crop is not always predictable in practice but has a decisive influence on its success and effectiveness.

Early Sowing Dates

An early sowing date, by the end of July, extends the vegetation period of the cover crops, which can lead to higher biomass development and better nutrient uptake. At the same time, there is a risk of going to seed in very early-sown stands, and components and varieties with a late flowering tendency must be selected. If the aim of cultivation is to control beet cyst nematodes, early sowing results in a high nematode reduction because the BCN nematode is active at higher temperatures. As a rule, early-sown stands are more likely to winterkill reliably.

Suitable Components:

Early sowing is particularly advantageous for legumes; crops such as phacelia or sunflowers also benefit.

Late Sowing Dates

However, sowing after preceding crops that are harvested later can also produce well-developed stands. A basic prerequisite for good stand development is rapid field emergence with sufficient moisture; therefore, it may even pay off to wait for rainfall when sowing. Sowing between the beginning and middle of September offers good opportunities in terms of soil cultivation, straw incorporation, and mice control. The later the sowing date, the more important higher seeding rates are.

Suitable Components:

Fast-growing species such as white mustard and Brassica juncea, fodder rape, winter turnip rape, or green rye are particularly suitable for later sowing.

In our sowing tables, we recommend an optimal sowing window for good development of the variety or the cover crop blends, based on our experience and trial data in Germany.

Our Recommendation:

Early sowing:

viterra® **UNIVERSAL**
viterra® **UNIVERSAL N-PLUS**
viterra® **BODENGARE**
viterra® **TRIO**

Flexible sowing:

viterra® **INTENSIV**
viterra® **INTENSIV N-PLUS**
viterra® **RÜBENGARE**

SortenGreening®
DEFENDER + common vetch
AGRONOM + common vetch
SILETTA NOVA +common vetch

Late sowing:

viterra® **SCHNELLGRÜN**
viterra® **SCHNELLGRÜN LEG´FREI**
viterra® **WASSERSCHUTZ**
viterra® **WINTERGRÜN**

Sowing Methods/Sowing Techniques

Whether cover crops can realize their agronomic benefits depends significantly on the sowing method. Intensive control of volunteer cereals and weeds, along with a fine-crumb seedbed following conventional drilling with ploughing, creates the best conditions for uniform field emergence.

Mulch Tillage

With mulch tillage involving prior soil cultivation, good seed placement and stand establishment can also be achieved, depending on the intensity. Deep loosening for the cover crop also means that only shallow mixing is necessary for the subsequent main crop. Both methods involve high labour and costs. With mulching tillage, sufficient waiting time after stubble cultivation is necessary to allow volunteer cereals to germinate. Deeper incorporation of straw leads to a dilution effect, and straw decomposition occurs faster.

Direct Seeding (No-Till)

In contrast, direct seeding is an efficient and cost-effective alternative for cover crop sowing, as it can enable a long vegetation period and high biomass formation. Emerging volunteer cereals must be prevented by very rapid sowing after harvest. It can be beneficial in dry locations to utilize the remaining soil moisture. Good straw distribution is crucial here.

Cultivator Seeding

With cultivator seeding, the seed is spread by a broadcaster mounted on the cultivator. Here too, prior straw distribution is particularly important. The high efficiency and low costs are advantageous. Disadvantages can arise from uneven seed placement, leading to poorer field emergence. Competition from volunteer cereals can also be very strong with cultivator seeding.

Drone Seeding

Advantages

The pre-harvest sowing method is particularly advantageous where working time and labour are limiting factors or where the catch crop should be allowed a long vegetation period (even with a late harvest). Sowing should take place 2-10 days before harvest. The moisture in the crop stand and the subsequent straw cover on the seed after harvest ensure a moist microclimate. Erosion problems are largely avoided, and soil rest is ensured. Since no soil is moved, less weed and volunteer cereal germination are stimulated.

Risks

Sowing into lodged grain is problematic; if this occurs, drone seeding must be avoided. Furthermore, there is a risk of delayed harvest and thus an overly developed catch crop that hinders harvesting or is destroyed by the combine harvester. If straw clumps occur, they cannot be distributed by tillage and prevent uniform emergence. Due to the very early sowing date, components, varieties, and mixtures with a later flowering tendency should always be selected. There is no possibility to incorporate organic fertilizer with tillage, and wheel tracks are not loosened by tillage. Less soil cultivation can lead to a higher infestation of slugs and mice.

Overall In trials, this method often led to higher biomass development, but in some cases also to failure and needs further testing under various conditions. Information on drone seeding suitability can also be found in the sowing table on page 10.

Summary:

	Conventional Drilling (with Tillage)	Direct Seeding (No-Till)	Drone Seeding
High Field Emergence	++	+	-
Biomass Development	0	+	++
Weed Suppression	+(+)	+	+
N-Mineralization	++	0	-
Mice Control	++	-	-
Limitations	++	0	-
Component Selection	++	+	+
Time/Costs	-	+	+
Utilization Residual Moisture	0	+	++
Dependence	++	0/+	0

Legend: – low 0 neutral + high ++ very high

Our recommandation:

Drill sowing is advisable for:

viterra® **MAIS**, viterra® **UNIVERSAL**,
viterra® **UNIVERSAL LEGUMINOSENFREI**,
viterra® **UNIVERSAL N-PLUS**,
viterra® **BODENGARE**,
viterra® **RAPS**,
viterra® **INTENSIV**,
viterra® **POTATO**,
viterra® **RÜBENGARE**,
viterra® **MAIS STRUKTUR**,
viterra® **MAIS N-PLUS**,
viterra® **HÜLSENFRUCHTGEMENGE**
SortenGreening® **DEFENDER** + common vetch,
SortenGreening® **AGRONOM** + common vetch,
SortenGreening® **SILETTA NOVA** + common vetch

Mixtures suitable for broadcast sowing/drone sowing:

viterra® **POTATO**, viterra® **RÜBE**, viterra® **TRIO**,
viterra® **UNIVERSAL N-PLUS**, viterra® **SCHNELLGRÜN**,
viterra® **SCHNELLGRÜN LEGUMINOSENFREI**,
viterra® **WASSERSCHUTZ**, viterra® **WINTERGRÜN**

SortenGreening® **DEFENDER** + common vetch,
SortenGreening® **AGRONOM** + common vetch,
SortenGreening® **SILETTA NOVA** + common vetch,
SortenGreening® **VERDI** + berseem clover

viterra® **BEISAAT FEIN**,
viterra® **BEISAAT GROB**,
viterra® **UNTERSAAT KLEE PLUS**,
viterra® **UNTERSAAT GRAS FRÜH**,
viterra® **UNTERSAAT GRAS SPÄT**

Management after winter

The remaining mulch layer in spring can vary greatly. Brittle material is ideal for mulch or direct seeding. Soil frost can be used to roll stands; these are weakened in winter, die off more easily, and are easier to work in spring. Furthermore, there are very good experiences with the cost-effective use of knife rollers.

Similarly, if stands are too developed, crimping, rolling, or mulching in autumn can prevent the cover crop from setting seed; however, this should be avoided on light soils due to the subsequent faster nutrient release.

Before early-sown summer crops on heavy soils, early incorporation of the cover crop before sowing can be beneficial so that the field can dry out.

Depending on the objective of the cover crop, a winter-hardy stand may also be desired, for example, for better trafficability in spring or additional nutrient uptake over winter.

For non-winter-killing cover crops, chemical or intensive mechanical measures are used. However, for regions prone to spring drought, winter-killing or early-tilled catch crops are more suitable as they do not draw on the water reserves of the subsequent crop.

The legally prescribed stand periods must always be considered when determining the timing of cultivation.

Conclusion

Establishing a satisfactory cover crop stand without autumn fertilization is a greater challenge. Conflicting requirements, such as an early sowing date and the careful control of volunteer cereals, necessitate compromises. Overall, however, it is evident that careful preparatory work and proper establishment of the catch crop lead to the best results. However, drone seeding of catch crops can also be a viable alternative and produce good stands. Regardless of the location, all soils benefit from the promotion of soil fertility and a good supply of organic matter. Thus, cover crop cultivation helps to achieve sustainable and high yields even with less fertilization.

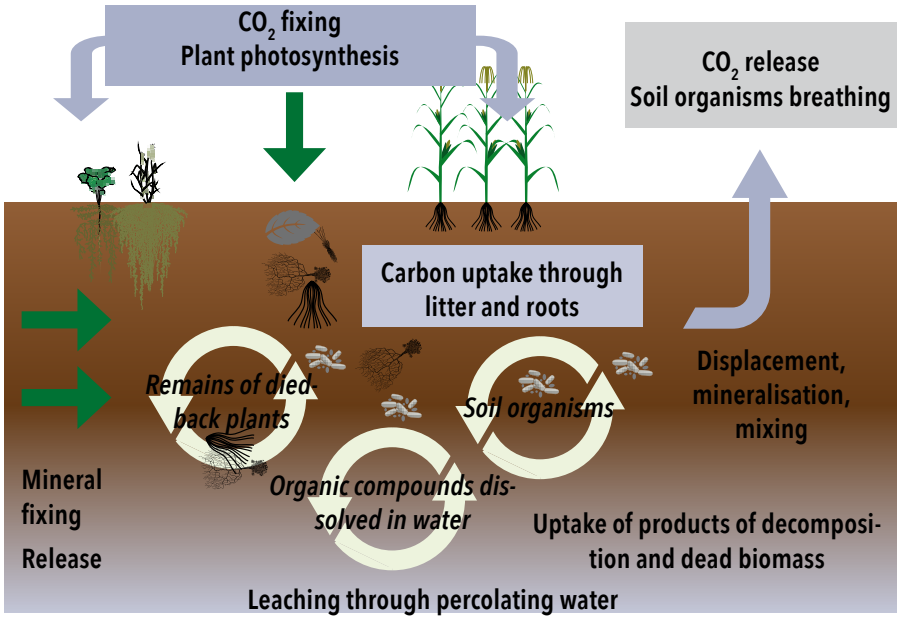
EXPERTS

Carbon farming and climate protection

Carbon Farming encompasses agricultural cultivation methods that sequester carbon from the atmosphere (CO_2) in soils. The long-term storage of carbon dioxide (CO_2 sequestration) relieves the atmosphere and counteracts global warming. Carbon farming is currently being widely discussed and, through the trading of certificates, represents a way to provide additional compensation to agriculture for specific environmental services.

However, many uncertainties still exist, as carbon storage is highly dependent on soil type and thus subject to significant site-specific variations. Uniform measurement methods and evaluation criteria need to be developed. These are currently the subject of numerous scientific projects.

The carbon cycle



Climate-Friendly Growth

Plants absorb carbon dioxide through photosynthesis and convert it into plant biomass as organic carbon. If this biomass remains in the field, it contributes to humus formation and thus to carbon sequestration. Organic matter in the soil consists of approximately half carbon and is a crucial indicator of soil fertility.

Soils with a high content of organic matter can store more nutrients and water and also release them back to plants. Additionally, the soil structure is improved, the leaching of nutrients and pollutants into the groundwater is reduced, and the soil's buffering capacity is increased. Soil organisms decompose the dead plant material into soil carbon through complex food webs. The breakdown of soil carbon into CO_2 (mineralization) is also primarily carried out by microorganisms.

Suitable Methods

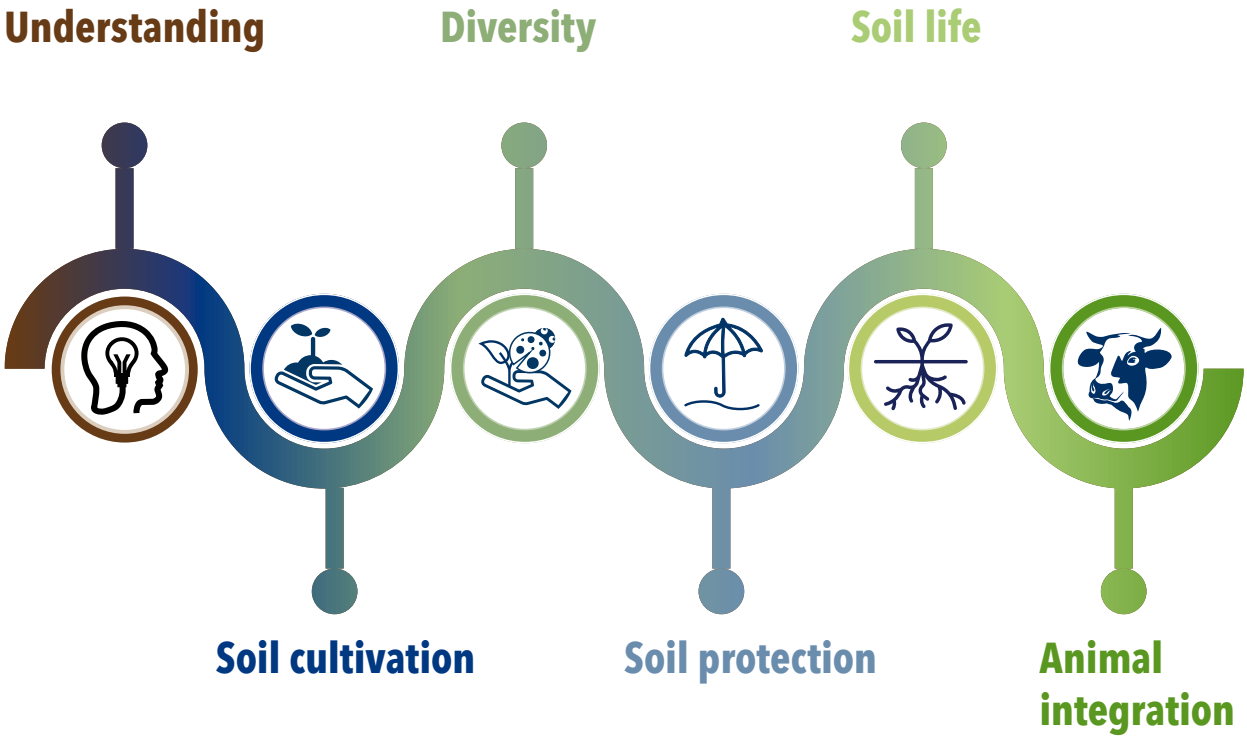
The selection of plants, fertilization, and soil cultivation can influence both the input of carbon into the soil and the living conditions of microorganisms, and thus the proportion of carbon that is mineralized.

Many of these practices are incorporated into '**Regenerative Agriculture**'. Here, the goals are also to improve soil health and the resilience of agricultural operations in times of climate change, reduce emissions, and increase the sequestration of organic carbon in the soil.

Another contribution of climate- and environmentally friendly cultivation methods is the integration of legumes into crop rotations. Since they not only autonomously produce their own nitrogen for growth but also make it available to companion plants and subsequent crops, legumes have an ideal CO_2 footprint.

One goal of cover crop cultivation has always been to promote soil fertility through soil protection, root penetration, and the supply of organic matter. Balanced, winter-hardy mixtures such as V-Max® LUNDSGAARDER GEMENGE, viterra® MAIS STRUKTUR, as well as viterra® UNTERSAAT GRAS FRÜH, viterra® UNTERSAAT GRAS SPÄT, and viterra® UNTERSAAT KLEE PLUS are therefore excellently suited to combine soil fertility and Carbon Farming.

Regenerative Agriculture



The following measures are therefore suitable for preserving and increasing carbon in the soil:

- Promotion of soil life and humus build-up through soil-conserving cultivation methods (mulching, direct sowing, etc.)
- Long and varied greening phases for intensive rooting (undersown crops, winter-hardy catch crops)
- Optimised crop rotations to regenerate the soil and improve nutrient utilisation
- Cultivation and use of undersown crops for rooting and erosion control
- Introduction and expansion of agroforestry for rooting, erosion control and water storage

EXPERTS for nutrient efficiency

Nutrient efficiency is more of a focus in agriculture than it has been for a long time. The reasons for this are increased fertilizer prices and restrictions on nutrient application, but also a greater awareness of resource and environmental protection. This increasingly challenges farmers to use and retain nutrients effectively in their cropping systems.

Solution: cover cropping

Protecting nutrients from leaching

Compared to some main crops, cover crops can absorb significantly more nutrients in autumn. Skillfully combined in viterra® cover crop blends, they intensively capture the soil volume with different root forms and ensure good nutrient uptake. This prevents nutrient leaching and creates an extensive nutrient depot for the subsequent crop.

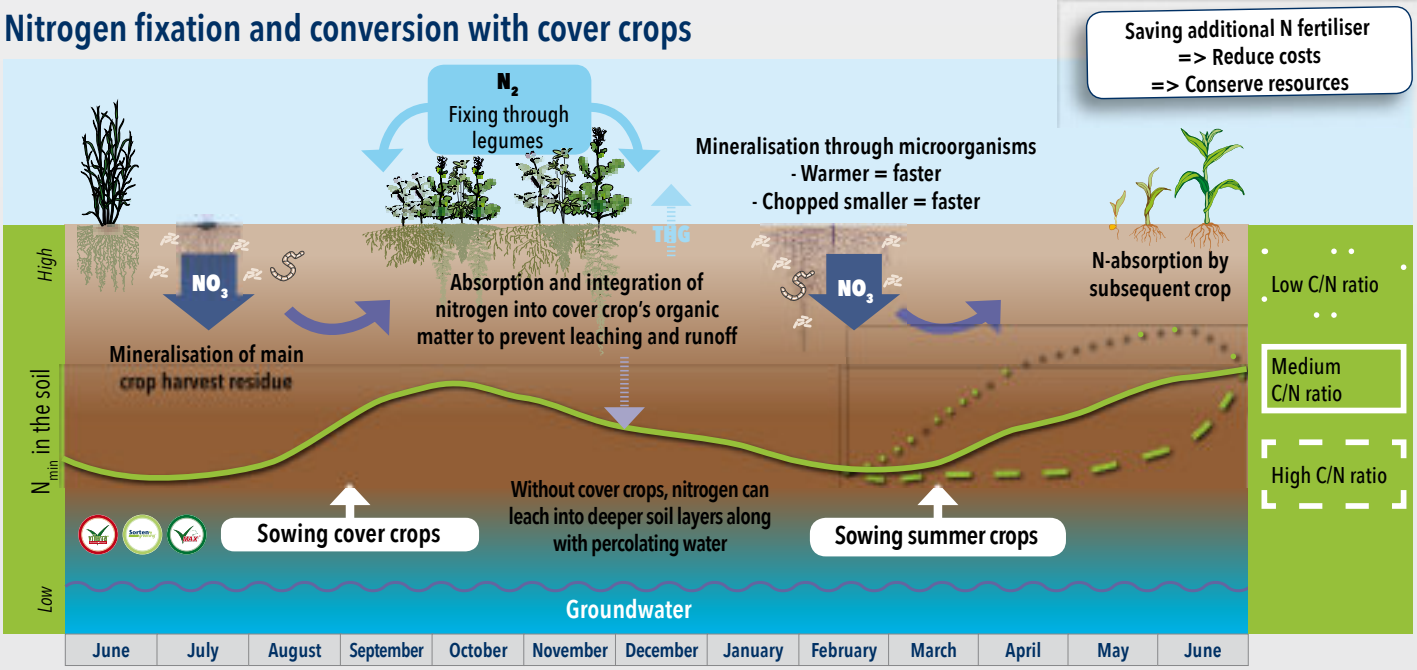
Bringing additional nitrogen into the system

Cover crop blends with a high proportion of legumes, which can fix atmospheric nitrogen through their symbiosis with nodule bacteria, bring additional nitrogen into the system. The cover crop itself and the subsequent crop benefit from this.

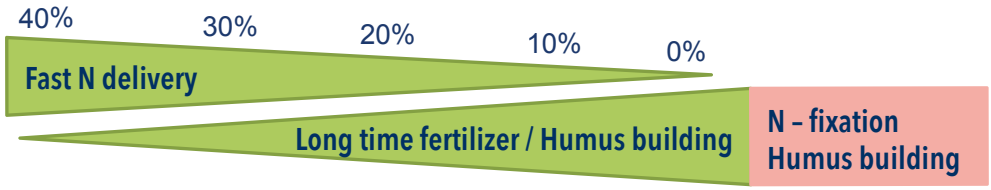
Nutrient transfer to the subsequent crop

Once the organic matter has been mineralized in spring, the nutrients previously bound in the cover crop are again available to the subsequent crop in plant-available form. The extent and timing of N-mineralization depend on various factors.

Nitrogen fixation and conversion with cover crops



C/N ratio and destruction time influence N-release and thus the availability for the following crop



C/N	7	10	13	17	20	25	50	100
Leg	green			ripening				
Non Leg	good	green			ripening			
	week		green			ripening		

	Ber-seem clover	Per-sian clover	Vetch	Oilseed radish COM-PASS	Phacelia ANGELIA	Saia oat PRATEX	Buck-wheat	White mustard ALBA-TROS	linseed
C [%]	32	31	38	35	46	42	43	48	50
N [%]	3	3	3	2	2	2	1	1	1
C/N- relatio	10	10	13	18	23	21	43	48	50

Rate of decomposition

The rate at which cover crop biomass decomposes (and thus releases its nutrients) is crucial for synchronizing nutrient availability with the needs of the subsequent crop. Several factors influence this decomposition rate:

C:N ratio: Cover crops with a low C:N ratio (e.g., legumes) decompose faster than those with a high C:N ratio (e.g., grasses). A lower C:N ratio provides microbes with more nitrogen, which they need for their own growth and metabolism, thus speeding up the decomposition process.

Plant maturity: Younger, less mature cover crop tissue decomposes more rapidly than older, more lignified tissue.

Environmental conditions: Warm temperatures and adequate moisture promote microbial activity and accelerate decomposition.

Tillage practices: Tillage can increase the contact between microorganisms and cover crop residues, initially accelerating decomposition. However, long-term no-till systems can also improve soil structure and microbial communities, leading to more sustainable decomposition rates.

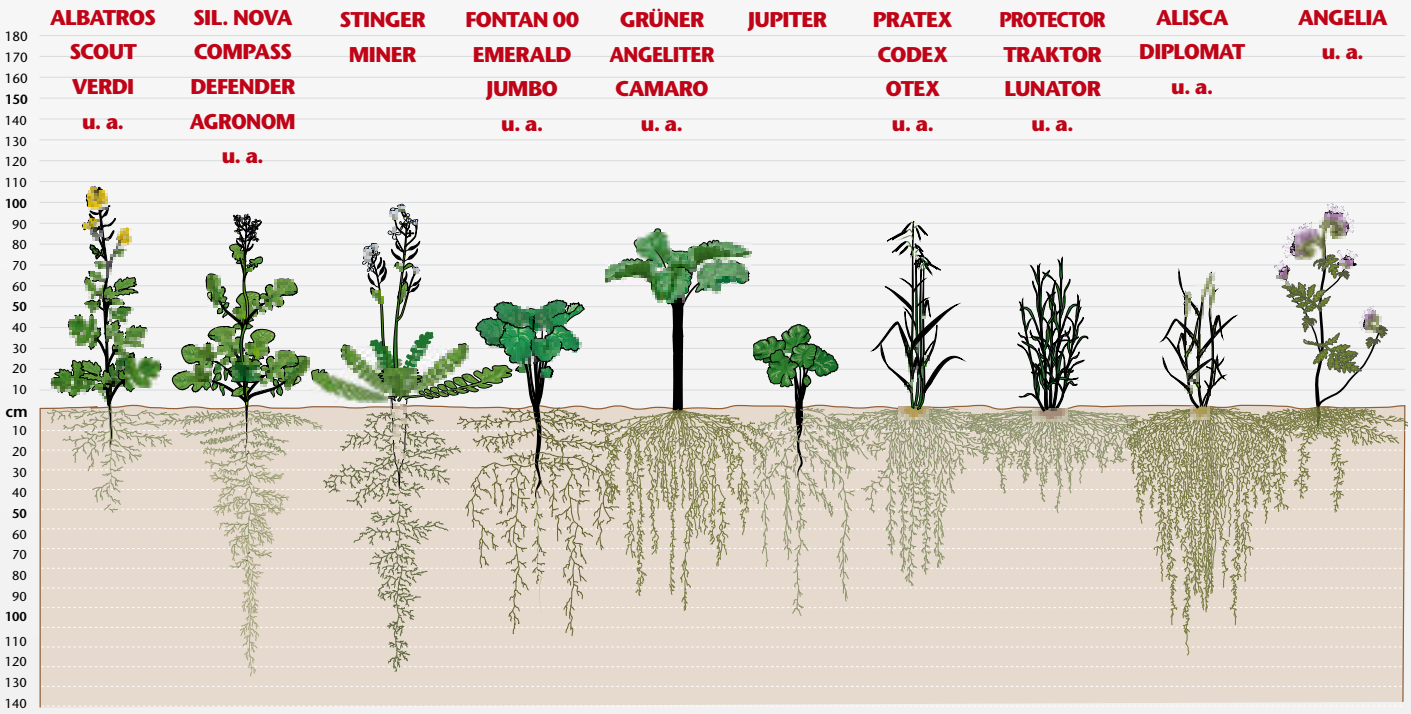
Table: Legume content and N-profit for subsequent crop

Legume content Seed %	Legume content Weight %	Blend	N-profit for subsequent crop (kg N/ha)
100%	100%	viterra® HÜLSENFRUCHTGEMENGE (ÖKO)	80-110
64%	89%	viterra® BODENGARE (ÖKO)	70-95
49%	46%	viterra® MAIS STRUKTUR	30-60
30%	69%	SortenGreening® SILETTA NOVA + Sommerwicke	40-80
30%	67%	SortenGreening® AGRONOM + Sommerwicke	45-90
30%	62%	viterra® MAIS N-PLUS	45-90
29%	67%	SortenGreening® DEFENDER + Sommerwicke	45-90
29%	56%	viterra® UNIVERSAL N-PLUS	35-60
28%	29%	viterra® WINTERGRÜN	40-70
28%	12%	viterra® RAPS	20-35
27%	67%	viterra® RÜBENGARE	40-75
27%	5%	viterra® UNIVERSAL	30-55
24%	69%	viterra® POTATO (ÖKO)	40-70
24%	54%	viterra® INTENSIV N-PLUS	40-80
24%	14%	viterra® TRIO	30-55

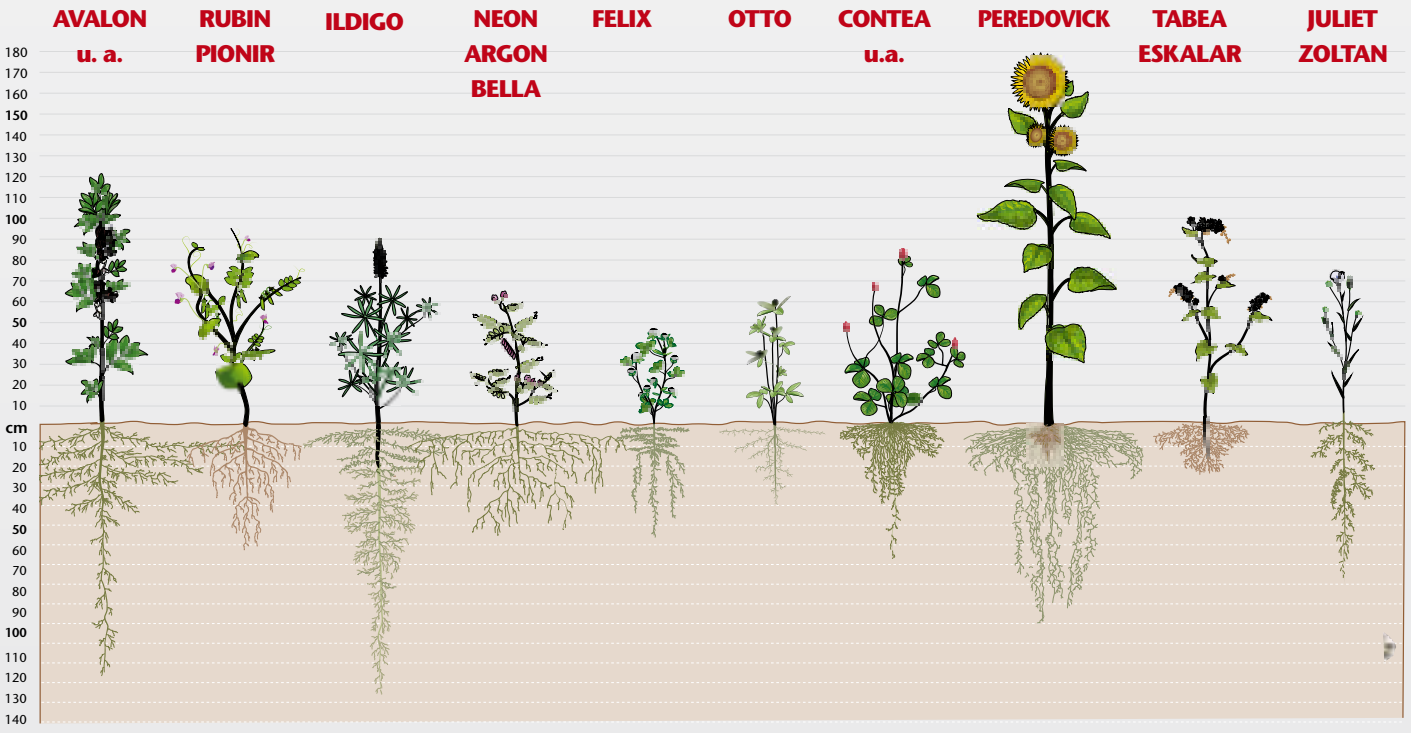
Legume content Seed %	Legume content Weight %	Blend	N-profit for subsequent crop (kg N/ha)
21%	6%	viterra® SCHNELLGRÜN	25-50
21%	10%	SortenGreening® VERDI + Alex.klee	25-55
0 %	0 %	viterra® INTENSIV	40-70
0 %	0 %	viterra® MAIS	25-40
0 %	0 %	viterra® RÜBE	30-55
0 %	0 %	viterra® SCHNELLGRÜN LEGUMINOSENFREI	15-30
0 %	0 %	viterra® UNIVERSAL LEGUMINOSENFREI	25-40
0 %	0 %	viterra® WASSERSCHUTZ	30-50
0 %	0 %	viterra® INTENSIV ÖKO	40-70
0 %	0 %	viterra® DEPOT ÖKO	25-40
0 %	0 %	viterra® SPRINT ÖKO LIGHT	25-40

Your N-profit with cover crops!

EXPERTS for your soil



White mustard | Oilseed radish | Tillage radish | Forage rape | Marrow stem kale | Winter turnip rape | Saia oat | Forage rye | Annual and Italian ryegrass | Phacelia



Fava bean | Field pea | Blue lupin | Common vetch / fodder vetch | Persian clover | Berseem clover | Crimson clover | Sunflower | Buckwheat | Linseed

Poster:
The most important cover crops at a glance. Order your copy at service@saaten-union.de, ask your sales rep or download one in the download centre.

Choice for EXPERTS

QUALITY

You have high standards – not only for the quality and yield of your main crops, but you also make no compromises with your cover crops: Then the **viterra**® and **SortenGreening**® Cover crop blends and the **V-Max**® blends for forage and biomass are your ideal cover crops!

These quality programs are composed of specially bred varieties based on cultivation trials. The seed contained is exclusively of extra quality and exceeds the legal standard for purity and germination. With these mixtures, you will also be supported by our regional advisors.

PURIST

If you prefer a pure catch crop or desire a specific variety, please consult our sales advisors. Our advisory team will inform you about availability and the sources of supply in your region.

INDIVIDUALIST

We mix according to your personal recipe!

With an order date up to May 15th and an order quantity of 1,500 kg per special mixture, we can prepare your desired blend with a lead time of four to six weeks. Please send us your percentage shares of the components or the desired mixture composition by seed count or weight to: **spezialmischung@saaten-union.de**

Alternatively, please contact our sales advisor in your region for this. Billing will be handled through your seed partner.

COST-EFFECTIVE

Catch crop cultivation should generate the lowest possible costs while fulfilling the necessary requirements. For this purpose, the BasisGrün® program offers cost-effective catch crop mixtures with practice-relevant species compositions. The seed quality is officially certified.

You can find more information about the cost-effective mixtures at the following link: **www.saaten-union.de/zwischenfruechte**

P. H. PETERSEN
SAATZUCHT LUNDSGAARD

About us

Seed is the foundation for providing people with healthy food. That's why we are already working on the varieties of tomorrow!

Breeding Station Gut Lundsgaard

„For almost 100 years, we have been perfecting seed in Schleswig-Holstein. Our entrepreneurial commitment and the performance of our competent and dedicated employees in product development, breeding, field implementation, and our production make us unique." - Matz Petersen, Managing Director

A passion for the highest quality in varieties, seed, and processing – that is what drives us. Unique seed quality is no coincidence for us: top-level breeding, the use of modern technology, the application of innovative approaches in processing, and the careful handling of our products by trained and experienced employees have been the cornerstones for P. H. Petersen from the very beginning.

Close collaboration with research institutes, consultants, and farmers provides us with valuable insights. This allows us to develop practical solutions that deliver convincing results directly in the field.

Diverse Range of Crop Species: Varieties and Mixtures

In cover crops, we offer the entire spectrum of modern options: from nematode- and multi-resistant catch crops for targeted soil biology management to cover crops for nutrient management and greening plants for soil and erosion protection, and forage plants for on-farm biomass production. We provide a comprehensive assortment for the current challenges in agriculture.

Our program is constantly being expanded and currently includes many different legumes for grain production, as well as for use as cover crops. In the cereal sector, we develop products for population rye and triticale.

Our comprehensive portfolio includes both individual varieties and practice-oriented blends within our own blending programs **viterra®**, **Sorten-Greening®**, and **V-Max®**, as ell as custom-blended mixtures according to customer requirements.

Our experienced team works closely with long-term propagation partners to achieve the best results. In our in-house laboratories, we prepare samples and conduct comprehensive analyses. At our locations in Lundsgaard (Schleswig-Holstein) and Sárbogárd (Hungary), we use state-of-the-art cleaning and processing facilities to guarantee the highest quality standards and germination rates. Each process step is accompanied by precise analyses to ensure the quality of the seed.

You are welcome to visit our website at www.phpetersen.com.

Sales with SAATEN-UNION

Since 1971, P. H. PETERSEN has been a partner in the SAATEN-UNION. This association of medium-sized plant breeders ensures that our varieties reach farmers globally in over 20 countries, as well as regionally through a strong network of field staff and experts – from breeding to field implementation.

P. H. PETERSEN
SAATZUCHT LUNDSGAARD

SAATEN UNION
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More information for EXPERTS

Our Websites

We provide up-to-date information for you on **www.saaten-union.de**. In addition to variety information, you will also find current cultivation recommendations and dates.

The direct way to cover crops is with **www.zwischenfrucht.de**

Simply scan the QR code or find out more at **www.saaten-union.de/downloadcenter**

Cover crop calculator

Working out which cover crop best suits your main crop and your business may quickly become a real challenge due to many different factors. Our cover crop calculator uses targeted questions about important conditions such as subsequent crop, soil processing, nutrient availability and sowing window to simplify your search and your decision-making process.

Simply go to https://www.saaten-union.de/zwischenfruchtrechner to use our online calculator.

YouTube

Many of our blends are introduced by our sales advisors in clips on YouTube. So you can get a glimpse of our cover crops in the field outside their growing windows.

www.youtube.com > saaten-union zwischenfrucht

BEST4 SOIL

The website best4soil.eu offers a wealth of information about nematodes. PHPETERSEN was part of this European project to set up a database with reliable and accessible knowledge. Now we provide financial support for this valuable resource to supply growers. You can access the data collection via the website of SAATEN-UNION.de.

Our EXPERTS for cover crops at P. H. Petersen Saatzucht Lundsgaard GmbH:

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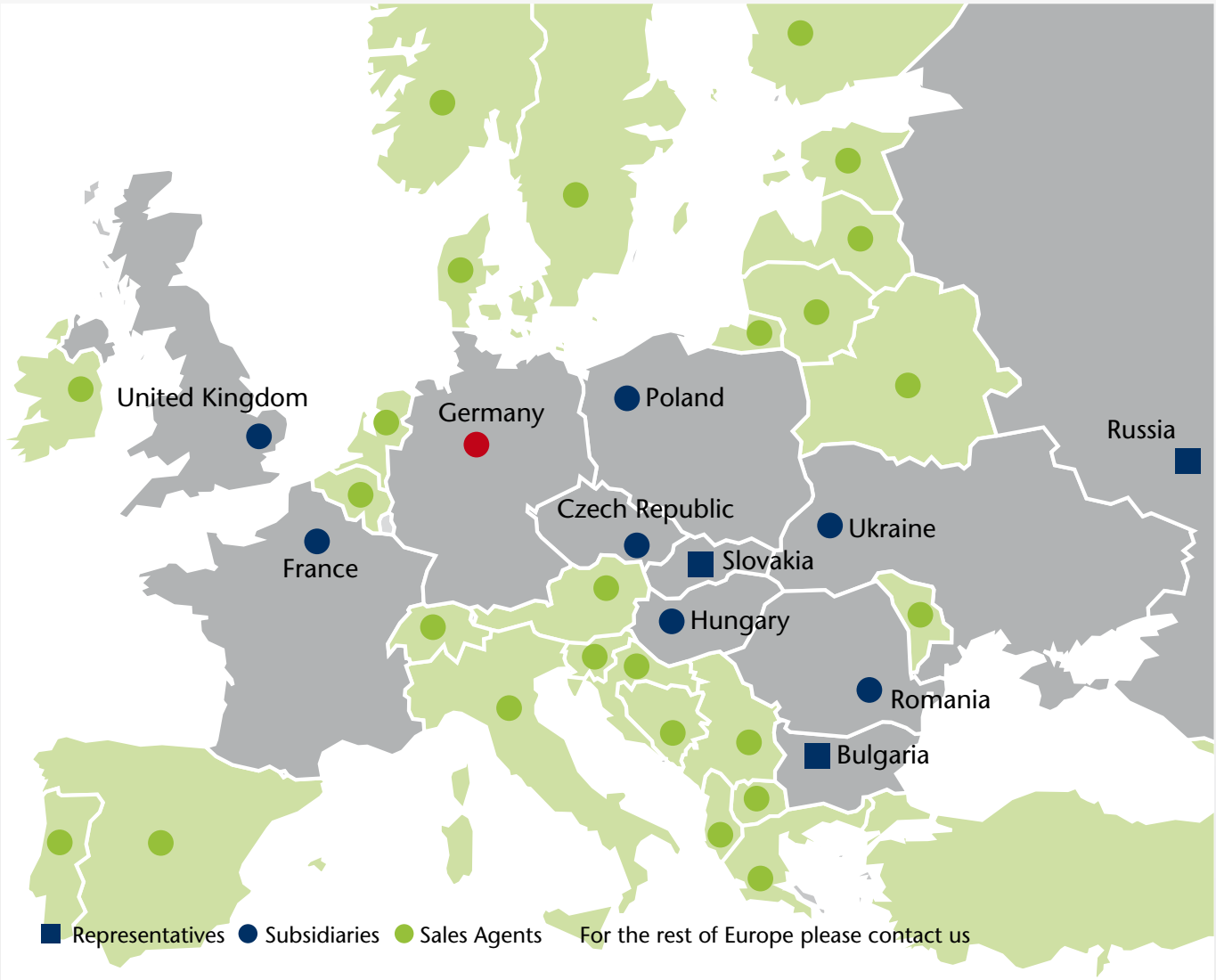
YOUR GROWING SUCCESS



Since its creation in 1965, SAATEN-UNION has been supplying farmers in Europe with high performance varieties that match the markets needs. SAATEN-UNION has already set milestones, and will continue to play a major role in plant breeding in years to come.

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Information Stand Mai 2025