












Farming for the Future

Soil Improvement Management



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About us

JSF is a company that supports growers improve yield and better their crops by biological principles.

With a world that is becoming less fond of chemicals and looking at more biological ways to look after and build your soils, **JSF** has the perfect solution to improve soils, productivity, quality and quantity of your cash crops, all the while moving towards more sustainable farming.

Here at **JSF** we believe that everything starts with your soil and it is your first priority on a long list of exercises to practice when farming.

Once your soil is sustainable, the rest seems to become a lot easier and more cost efficient.



Our Team



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What are Nematodes

Nematodes, also known as eelworms and roundworms, are one of the most abundant creatures living in soil. Nematode species are very difficult to distinguish, over 28,000 species have been described, of which over 16,000 are parasitic. The total number of nematode species has been estimated to be about 1 million. Although some of these tiny, worm-like animals are beneficial, about 50% are detrimental to plant health and on a global scale it has been estimated that these parasitic species reduce agricultural production by a figure in the order of 12%.

Plant parasitic nematodes behave in different ways, some feed externally on plant roots (ectoparasitic forms) whilst others invade the roots internally (endoparasitic forms). The resultant damage that nematodes cause food crops worldwide can vary from a reduction in yield and/or reduced marketability of the affected crop. The damage levels sustained by an individual crop will of course vary from field to field and will be influenced by a wide range of factors. These factors will include the density of the nematode population, the virulence of the species or strain which has targeted the individual crop and the level of tolerance/resistance which the affected crop can muster against the attack.

An integrated approach to nematode control is essential, but the growing of a cover crop is a very effective way of controlling nematode populations as well as improving the soil structure and returning valuable nutrients for the following crop to utilize. Choosing the correct variety to grow needs careful thought and pre-planning.



Types

Root Knot Nematodes

They produce galls especially on root crops and can severely damage plant health. Crops at risk include peas, onion, carrot parsnip and spring wheat. Please note that the knot nematode *Meloidogyne chitwoodi* and *Meloidogyne fallax* have quarantine status.

Beet Cyst Nematodes (BCN)

Beard like objects which grow and live on root surfaces. Wide spread in Europe and many other parts of the world. Crops at risk include potato, sugar beet, rape and beetroot.

Lesion Nematodes

These nematodes produce necrotic lesions throughout the cortex of infected roots. Crops at risk included carrot and parsnip, maize and some legumes.

Stem Nematodes

They can cause distortion in the stems of winter beans and necrotic areas on plant leaves. Crops at risk are potato, onion, flower bulbs and winter beans.

Stubby Root Nematodes

A large family of nematodes that make plant roots have a stunted or stubby appearance. The infected roots are less capable of supplying nutrients and water to the plant. Crops at risk are potato, sugar beet, onion, carrot and parsnip.



Nematodes

Nematodes and Cover Crops

Once you have identified the problem nematode other criteria you need to consider are:

- Harvest date and time available to sow the cover crop
- Cover crops can be sewn throughout the year
- Soil type (determine the sowing rate)
- Ability to mow and incorporate the cover crop in late autumn

The most popular cover crops used in South Africa/ Africa are nematode resistant varieties of oil seed radish and whit mustard, with forage rye and phacelia used mainly as green manure.

As well as reducing nematode populations cover crops can produce benefits by amelioration of the soil structure and returning organic matter to depleted soils. With the limited amount of farm yard manures on many arable enterprises the inclusion of organic matter in its self is a major benefit. The chart below shows the nutrient uptake from non-fertilized cover crops drilled after winter wheat is made available for the benefit of the following crop.

	DM yield	Total N	Total P	Total K
	ton/ha	kg/ha	kg/ha	kg/ha
Mustard	1,1	22	4,4	23,6
Oil seed raddish	1,5	32,4	7,2	47,4

Source ITB France 2009

Growing a Cover Crop

Cover crops are best sown in late summer or early autumn, however they can grow throughout the year. Ploughing and making a new seed bed will give the best results but seed can be drilled or broadcast into cereal stubble after harvest. If timing is an issue, seed can also be broadcast into standing cereal crops. A nitrogen application of 60-80 kg per hectare will help the crop to establish rapidly and ensure that there is a good amount of biomass for incorporation in 8-12 weeks from the sowing date. The crop should be chopped and incorporated when the plants are flowering as this is when the glucosinolate content is at the highest. Crops are also best incorporated in the morning but never incorporate a wet or dewy crop as this could have a negative influence on soil structure.



Terranova (Bladremmenas)

Oil seed radish



This variety has been specially bred to reduce a broad range of nematodes. Terranova is frost resistant up to minus 8° C. Terranova is very leafy at the early stages of growth and is easily incorporated for maximum nematode control and is club root resistant. It has unique resistance to (sub-) tropical root-knot nematodes *M. incognita* *M. javanica*. Terranova is resistant to *Heterodera schachtii* (BCN) *Heterodera betea* *Meloidogyne chitwoodi* *M. fallax* *Meloidogyne incognita* and *javanica* Para *trichodorus allius* Terranova is non-host to: *Globodera rostochiensis* *G. Pallida* *Heterodera avenae* *Heterodera goettingiana* *Meloidogyne naasi* *Ditylenchus dipsaci* *Ditylenchus destructor* Tobacco rattle virus (TRV)

Terranova is resistant to	Terranova is non-host to
BCN (<i>Heterodera schachtii</i>) Nematode Resistant Level 1	<i>Globodera Rostochiensis</i> & <i>G. Pallida</i> (PCN)
<i>Heterodera betea</i> (BCN)	<i>Heterodera avenae</i> (cereal cyst nematode)
<i>Meloidogyne chitwoodi</i> and <i>M. fallax</i> (RKN)	<i>Meloidogyne naasi</i> (RKN)
<i>Meloidogyne Incognita</i> And <i>Javanica</i> (RKN)	<i>Meloidogyne Naasi</i> (RKN)
Para <i>trichodorus allius</i> (stubby root nematode)	<i>Ditylenchus dipsaci</i> & <i>D. destructor</i> (stem nematode)
	Tobacco rattle virus (TRV)

Doublet (Bladremmenas)

Oil seed radish

This variety has been specially bred to reduce nematodes, it has a unique combination of the highest resistance to beet-cyst nematodes and Root-knot nematode resistance.

Doublet will produce a long tap root up to 2 meters deep, which will improve the soil structure and is frost resistant up to minus 8°C.

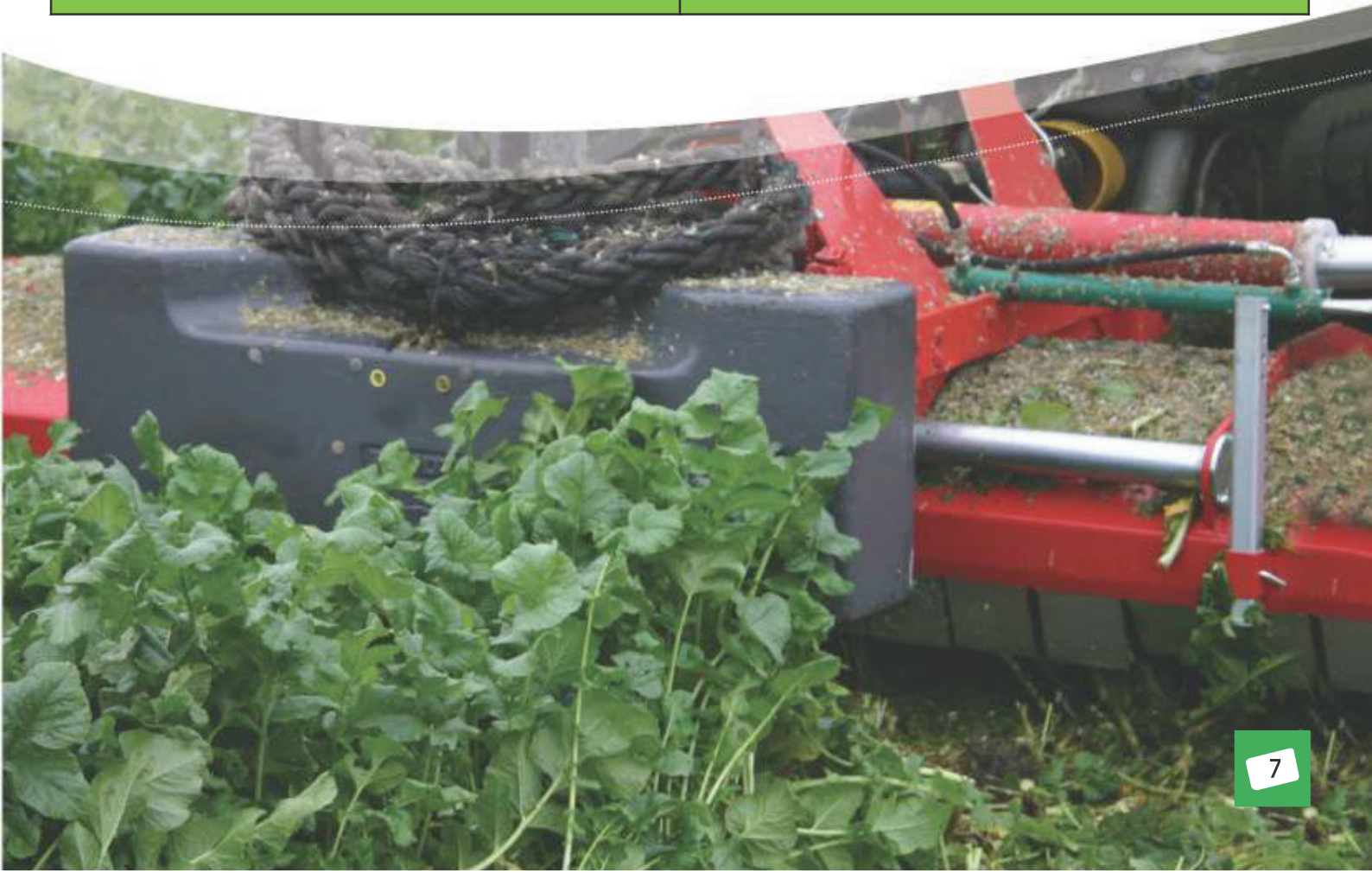
Doublet is very leafy at the early stages of growth and is easily incorporated for maximum nematode control and is club root resistant.

Doublet flowers late and will not set seed when sown in late summer or early autumn.

Doublet is resistant to: *Heterodera schachtii* *Heterodera betea* *Meloidogyne chitwoodi* *M. fallax* *Meloidogyne javanica* *Para trichodorus allius*.

Doublet is non-host to: *Globodera rostochiensis* *G. Pallida* *Heterodera avenae* *Heterodera goettingiana* *Meloidogyne naasi* *Ditylenchus dipsaci* *Ditylenchus destructor* *Pratylenchus scripnerie* (Scribner's lesion nematode) Tobacco rattle virus (TRV)

Terranova is resistant to	Terranova is non-host to
BCN (<i>Heterodera schachtii</i>) Nematode Resistant Level 1	<i>Globodera Rostochiensis</i> & <i>G. Pallida</i> (PCN)
<i>Heterodera betea</i> (BCN)	<i>Heterodera avenae</i> (cereal cyst nematode)
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<i>Meloidogyne Incognita</i> And <i>Javanica</i> (RKN)	<i>Meloidogyne Naasi</i> (RKN)
<i>Para trichodorus allius</i> (stubby root nematode)	<i>Ditylenchus dipsaci</i> & <i>D. destructor</i> (stem nematode)
	Tobacco rattle virus (TRV)



Nema Oats

Nema Oats is a cereal crop which has a high early vigour and flowers relatively early.

Drilled at the right rate, this crop can produce, in a relatively short period of time, high amounts of biomass.

Kg planted per Ha is about half normal black oats.(30-35KG per Ha).

Nema oats can grow up to double the height of normal conventional oats and can produce more bales per Ha.

Nema oats are non-host to the root lesion nematode *Pratylenchus penetrans* Meloidogyne chitwoodi.

Very good cover crop.

Increasing yield and quality.

TRIO (Rocket Lettuce)

The latest crucifer cover crop in our portfolio is rocket lettuce.

This crop flowers rather late with an average early vigour.

If biomass production is obtained it should not be sown too late in the season.

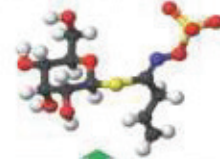
Rocket lettuce is like oil seed radish a dual purpose in regards to diseases and pest control.

Our variety TRIO is suitable as a biological controller of cyst nematodes *H. schachtii* *betae* *M. chitwoodi* *incognita* Due to high levels of glucosinolate it can also be used for biofumigation.

Combined with oil seed radish Trio fights the nematodes mentioned above and while growing, has an extra effect with biofumigation after chopping.

Mechanism of biofumigation with Brassicaceae

GLUCOSINOLATE



TISSUE DAMAGE

WATER

ISOTHIOCYANATE



MYROSINASE



Brisant (White Mustard)

Brisant has been specifically bred for the nematode market and shows a high level of resistance.

Brisant is very leafy and will produce a tap root up to 1,5 meter in length.

Brisant is frost susceptible and easily incorporated into the soil.

Brisant is very fast growing, even at lower temperatures and can also help reduce *Rhizoctonia Vitaro*

is resistant to: *Heterodera schachtii* (BCN) *Heterodera betea* Vitaro is non-host to: *Globodera*

rostochiensis G. Pallida *Heterodera avenae* *Heterodera goettingiana* *Meloidogyne naasi*

Ditylenchus destructor brisant has been specifically bred for the nematode market and shows a

high level of resistance.

Brisant is very leafy and will produce a tap root up to

1,5 meters in length.

Brisant is frost susceptible and easily incorporated into

the soil.

Brisant is fast growing, even at lower temperatures and

can also help reduce *Rhizoctonia* Brisant is resistant to:

Heterodera schachtii beet cyst nematode (BCA)

Heterodera betea Brisant is non-host to: *Globodera*

rostochiensis G. Pallida *Heterodera avenae*

Heterodera goettingiana *Meloidogyne naasi*

Ditylenchus destructo



Utopia (Brown Mustard)

The latest new cover crop in the family of Brassicas is abyssinian mustard. The new generation varieties are very suitable for biofumigation and game cover.

The variety Cappuccino is due to its high levels of Glucosinolates (among Them Sinigrin) extremely suitable for this Use. Abyssinian Mustard is not that much susceptible to frost but less as white mustard. in our portfolio we have varieties available which flower after 60 or even after 90 days with preservation of a good early vigour.

Utopia is a late flowering mustard, which is very leafy but frost susceptible. A long tap root helps to improve soil structure. Utopia can produce high levels of biomass. Together with high levels of the glucosinolate sinigrin, cappuccino has a very good biofumigation potential. Utopia performs best in cooler climates.

Utopia very late Flowering. Ideal to mix with Berseem Clover to be used as N-fixating and N-trap crop. Carbon late flowering, Fast early vigour, High Biomass.



Brigadier

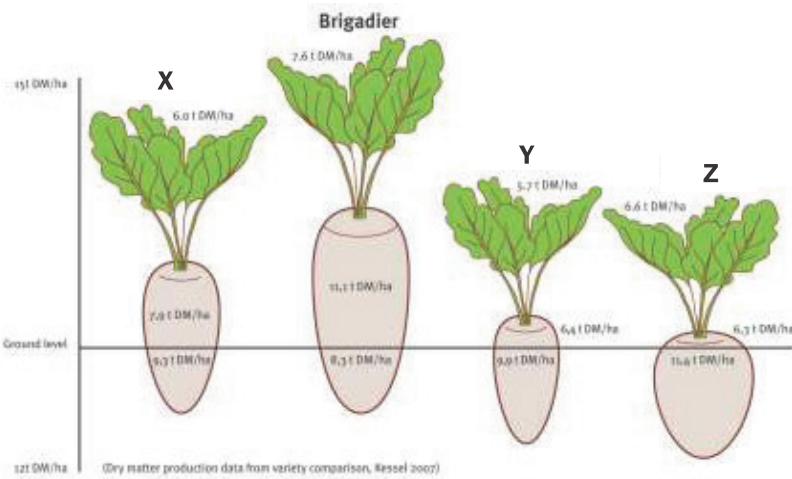
High Yield

- Brigadier is one of the highest yielding forage options available to farmers.
- Fresh yields of up to 300t/ha with a dry matter content of 11-12% are possible.
- Brigadier is a long growing-season crop which requires a high level of care in establishment.
- It is not a brassica so it is not susceptible to brassica diseases.
- Once established, it is highly palatable to animals.
- Brigadier requires a weed free, firm fine seed bed that is well drained with no sub-soil compaction.
- Sowing is best in early spring season (soil temp 5°C, after the last frosts).
- Sowing rate is recommended at 80,000 plants per hectare through a precision drill.
- If seed is sown using conventional drill, a higher seeding rate is needed.
- Care is required when preparing a seed bed but after establishment the crop will tolerate moderate drought conditions better than forage plants currently do.
- To promote rapid establishment, seed should be sown to a depth of 2-3cm, in drier seed beds it is best to sow slightly deeper so the seed can access as much moisture early on as possible.
- A successful fodder beet can be extremely profitable.



Grazing of Brigadier

Joordens a European based company in which we participate, developed a new way of using fodder beets. Instead of using special harvesting equipment to lift the roots after which storage is required, plots will be strip-grazed by livestock. At maturity, animals are moved into a strip for grazing. Because the beets do not have to be lifted, animals can use the entire plant, including leaves, which give up to 5t/ha extra day matter. All together, the yield of a Brigadier crop gives 20 to 40 tonnes dry matter in a period of 4-6 months. Strip grazing is recommended to avoid damage to the crop. Essential for grazing system is the absence of severe night frosts up to the final grazing.



Sowing Rate	Season	Sowing depth	Row distance	Fertilizer	Note
80.000 seeds /ha	Early Spring	2-3cm	50cm		Brigadier

Brigadier is most suitable for grazing due to:

- Bulbs sit high out of soil, which means easy access for animals
- Soft bite due to low dry matter content makes it suitable for all kinds of animals
- Abundant healthy leaves give good weed suppression and extra dry matter yield
- High sugar level makes it very palatable
- Suitable for milk-and beef cattle, sheep, deer and other animals
- Brigadier breaks for traditional weed and pest cycle of brassica
- Relative low use of nitrogen
- Palatable forage stimulates extra high total intake by animals.



Farmax SRP



The Farmax type SRP is a rotary spader for the use on tractors from 25 until 60 HP. This machine's size is specifically designed for use by vegetable growers, tree nurseries in the fruit production and in hot houses. Hard and or disturbing layers in the ground are completely broken and mixed with the soil to gain a perfect seed or plant bed. The Farmax SRP can be equipped with a rotary harrow for a perfectly compact soil and loosened top.

Model	Working Width	Max Working Depth	Weight inc. Rotary Harrow	Spade Quantity
SRP 105	105 cm	45 cm	540 kg	12
SRP 125	125 cm	45 cm	560 kg	12
SRP 155	155 cm	45 cm	645 kg	12
SRP 185	185 cm	45 cm	720 kg	12
SRP 210	210 cm	45 cm	810 kg	12



Farmax DRP Perfect



The Farmax DRP Perfect is a rotary spader that is developed for use on tractors from 80 until 120 HP, available in several working widths, and can be equipped with options like an hydraulically adjustable rotary harrow, a rotary tiller, ring roller or packer roller to create the perfect seed or plant bed on every type of soil.

Model	Working Width	Max Working Depth	Weight inc. Rotary Harrow	Spade Quantity
DRP Perfect 185	185 cm	45 cm	1300 kg	15
DRP Perfect 215	215 cm	45 cm	1425 kg	15
DRP Perfect 245	245 cm	45 cm	1660 kg	18
DRP Perfect 275	275 cm	45 cm	1725 kg	24
DRP Perfect 300	300 cm	45 cm	1800 kg	24



Farmax LRP Profi 300



LRP Profi with rotary harrow and coulters



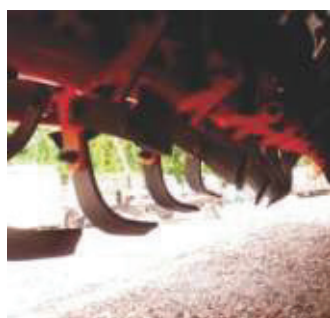
LRP Profi with rotary harrow and Hydr. 2th roller



LRP Profi with rotary harrow and hydr. lift



LRP Profi with hydr. packer roller



LRP Profi with Hydr. adjustable rotary tiller



LRP Profi with Hydr. adjustable roller



Depth indicator



Spades with shear bolt

The Farmax LRP Profi is a rotary spader for crop growers and contractors. This machine can be used on tractors from 120 until 200 HP. The Farmax LRP Profi comes standard with a hydraulic adjustable rotary harrow, packer roller, ring roller or a rotary tiller. A second hydraulically adjustable roller is also possible so you will be able to create the perfect seed or plant bed in every type of soil. Working depths from 20cm until 55cm.

Farmax Rapide



Rapide 300



Rapide 400 with Ringrol



Rapide rotary tillers and Comby Scapers

The Farmax Rapide is a heavy duty machine for tractors with a 200 until 300 HP, which can be delivered in working widths from 3m until 4.50m.

This machine is mostly used on heavy soil and clay. The Rapide also comes with the same options as the LRP Profi.

Farmax LRG-D deep Spading Machine



The Farmax LRG-D is a carried rotary deep spading machine with working widths from 2.50m until 2.80m and working depths from 80cm until 100cm. A hydraulically adjustable pressure roller can be added. The specially developed spades have a mixing ability to create a uniform soil structure. Because of the compact design and the low weight of 3300kg's this machine can easily be handled in a three point lift of tractors with 160 or 230 HP.

Farmax KRG-D deep Spading Machine



The Farmax KRG-D is a hauled rotary deep spading machine. The deep spader with a working depth of 1.20m comes in working widths of 2.50m and 2.80m. The special spades have a perfect mixing ability. Because of the tyre roller the soil will be firmly compacted after the spader. This way the capillary effect will be restored quickly so rainwater will be drained again or drought will be prevented.

Farmax Rapide 300



With the introduction of the Farmax Rapide 300 a new generation of digging machines is created. Tested under extreme conditions, the machine was developed to easily operate in sand, clay or rocky soil.

A plate of P.E. prevents soil from sticking onto to the machine.

Blades and rotor cleaners are fixed together to provide more space inside the machine.

Standard equipped with a digital rev counter on the rotor shaft, the number of digging revolutions can be checked exactly.

Depending on the type of soil, the Farmax Rapide 300 can be fitted with a power harrow, rotovator, cage roller or ring roller, to produce a perfect sowing bed.

Fittings are applied to easily attach a Kongskilde sowing machine.

Working Width	3.00m & 4.00m
Working Depth	50cm
Power	From 125Hp/92kw to 300Hp/221kw
Weight	2950kg
Capacity	1 - 2 ha/h
Crumbler Roller	Ø 400mm
	1000 rpm

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