A Fly for a Fly – Frass to control cabbage root fly in cauliflower production systems in Belgium

EAAP 2024

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ondernemen in west-vlaanderen

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ONDERZOEK & ADVIES IN LAND- & TUINBOUW

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What is frass?

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ONDERZOEK & ADVIES IN LAND- & TUINBOUW

What is frass? Visually

What is frass?: Chemically

Parameter	Value	BSF	YMW
C/N	Average	13.8	10.8
	SD	6.1	4.0
	#	44	14
N	Average	2.95	4.53
	SD	1.22	2.19
	#	63	14
P	Average	1.28	1.43
	SD	0.97	0.53
	#	60	13
K	Average	1.97	1.89
	SD	1.29	0.54
	#	49	13
pH	Average	7.78	6.10
	SD	0.83	0.34
	#	39	8

BSF NPK-ratio: 3-1-2

YMW NPK-ratio: 5-1-2

BUT… More than NPK
Potential as biostimulant

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What is frass? According to regulations

A mixture of faeces of insects, leftovers of the feeding substrate, (parts of the) dead insects, unhatched eggs.

With amount of dead insects nog exceding 5% in volume or 3% of weight of the total.

Source: Regulation (EU) 2021/1925

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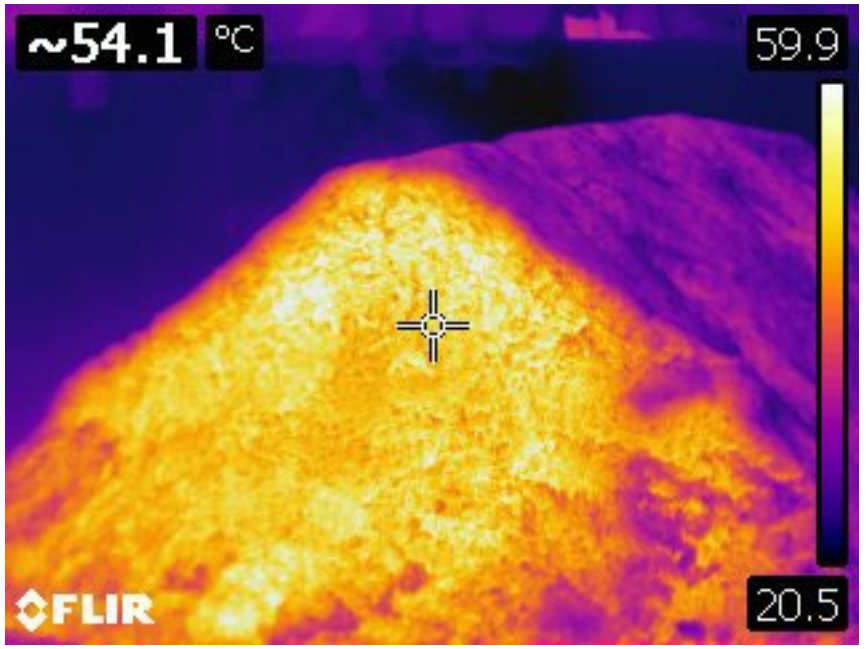
What is frass? According to regulations

- Heat treatment is necessary (1 hour - 70 °C)
- In Flanders, Belgium frass is considered manure
  (waste regulations)
- But is allowed to be used in organic farming



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Effect of frass on cabbage root fly in conventional production systems (*Delia radicum*)

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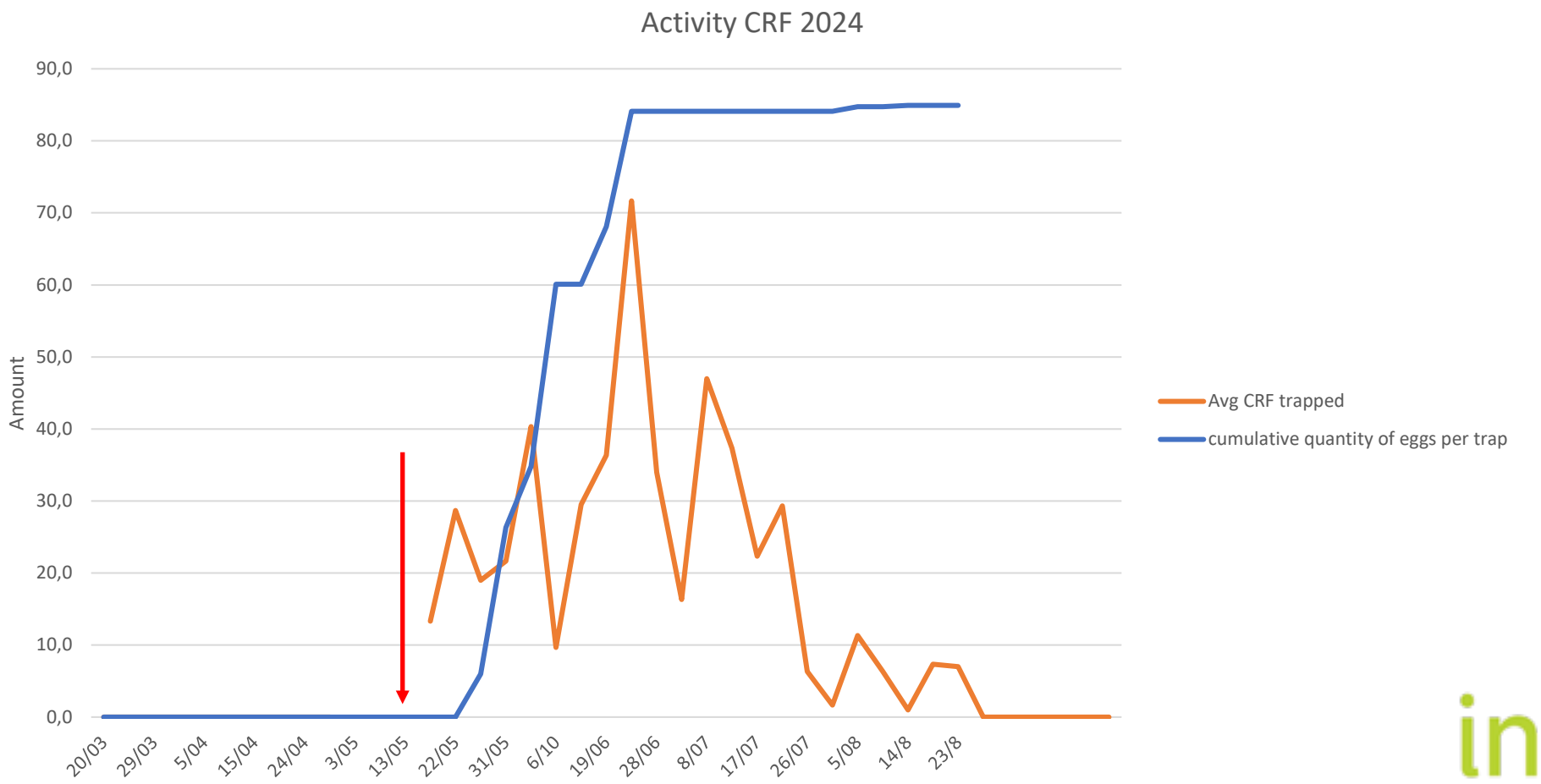
CRF Abundancy



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Field trial 2022

Nr	Object						Application moment
	Plant box	granulate/pour on	Active Ingredient	Remarks	dosis	unit	
1	untreated				-	-	-
2	Verimark	Plant box	cyantraniliprole		15	ml/1000 planten	B
3	Tracer	Plant box	Spinosad		12	ml/1000 planten	B
6	Pellets Frass BSF	Pellets/granulate	-	71 g/plant	2000	kg/ha	C
7	Pellets Frass mealworms	Pellets/granulate	-	71 g/plant	2000	kg/ha	C
8	Frass BSF	Powder	-	71 g/plant	2000	kg/ha	C

B Plant box (2/5)
C at planting (3/5)

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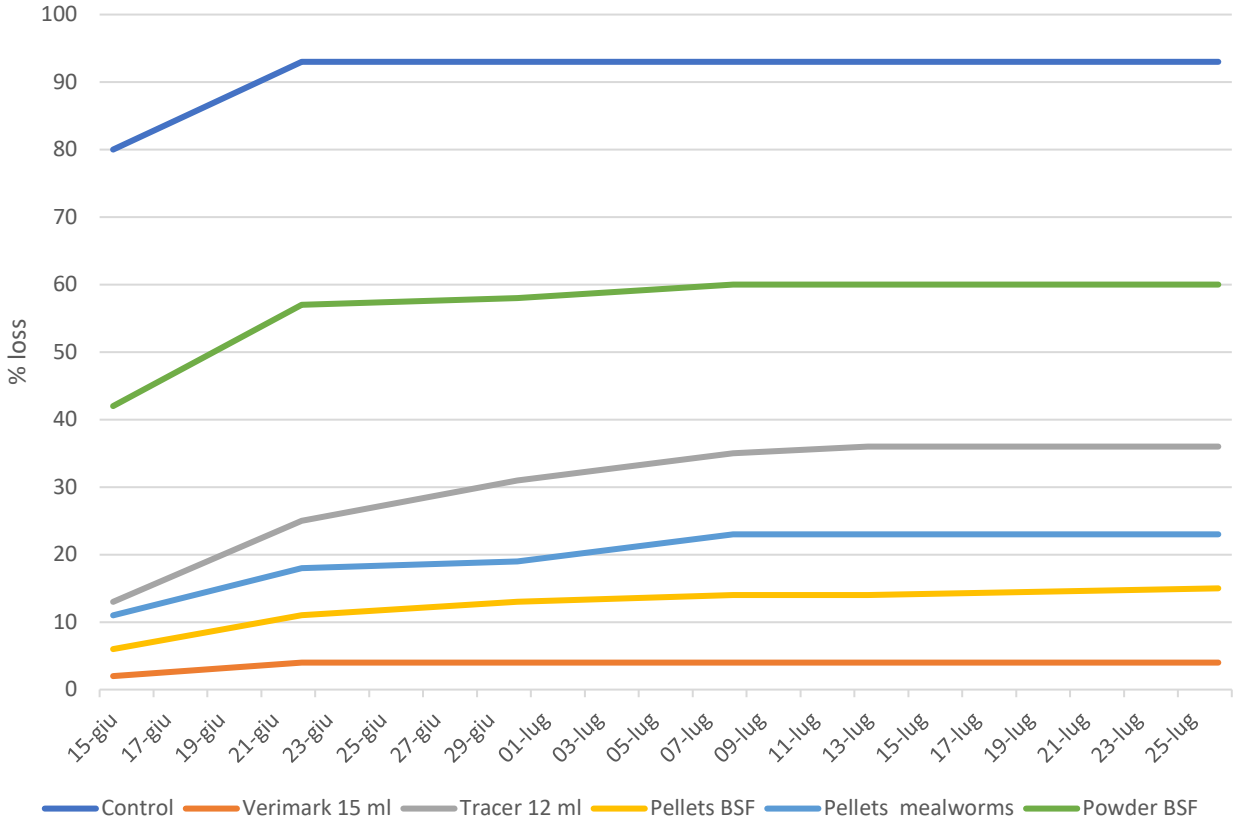
Controle


Spinosad


Controle


BSF pellets

Results 2022



	% marketable	Total harvest (t/ha)	Average weight/cabbage
Control	7	2	0,7
Verimark 15 ml	94	26	1,0
Tracer 12 ml	63	17	1,0
Pellets BSF	81	22	1,0
Pellets mealworms	78	22	1,0
Powder BSF	39	10	1,0

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Field trial 2023

Nr	Object						Application moment
	Plant box	granulate/pour on	Active Ingredient	Remarks	dosis	unit	
1	untreated				-	-	-
2	Verimark		cyantraniliprole		15	ml/1000 planten	A
3		Pellets Frass BSF (at planting)		71 g/plant	2000	Kg/ha	B
4	Verimark		cyantraniliprole		15	ml/1000 planten	A
		Pellets Frass BSF (after 4 weeks)		71 g/plant	2000	Kg/ha	F
5	Tracer		Spinosad		12	ml/1000 planten	A
		Pellets Frass BSF (after 4 weeks)		71 g/plant	2000	Kg/ha	F
6	Tracer		Spinosad		12	ml/1000 planten	A

A plant box (3/5)
B at planting (4/5)
F after 4 weeks (31/5)

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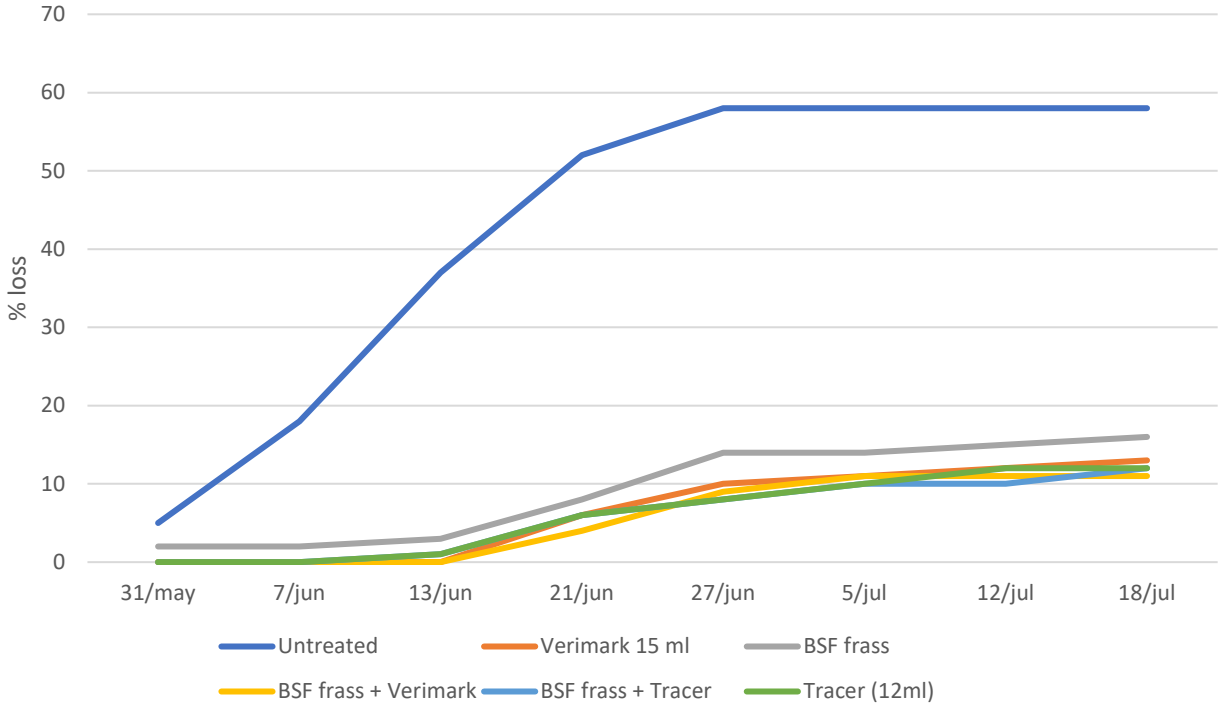
Results 2023



	% marketable	Total weight of marketable cabbage (t/ha)	Average weight/cabbage
Untreated	39	13	1,2
Verimark 15 ml	74	24	1,1
BSF frass	81	24	1,1
BSF frass + Verimark	82	26	1,1
BSF frass + Tracer	73	24	1,1
Tracer (12ml)	73	24	1,2

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Field trial 2024

Nr	Object						Application moment
	Plant box	granulate/pour on	Active Ingredient	Remarks	dosis	unit	
1	untreated				-	-	-
2	Tracer		Spinosad		12	ml/1000 planten	A
3		BSF Frass (dose 3) + net cover		82 g/plant	2285	Kg/ha	B+C
4		BSF Frass (dose 1)		2,6 g/plant	74,4	Kg/ha	B
5		BSF Frass (dose 2)		25,5 g/plant	714	Kg/ha	B
6		BSF Frass (dose 3)		82 g/plant	2285	Kg/ha	B
7		BSF Frass (dose 4)		127g/plant	3570	Kg/ha	B
8		BSF Frass (dose 5)		255 g/plant	7140	Kg/ha	B

A plant box (12/5)
B at planting (13/5)
C netting for 3 weeks (13/5)

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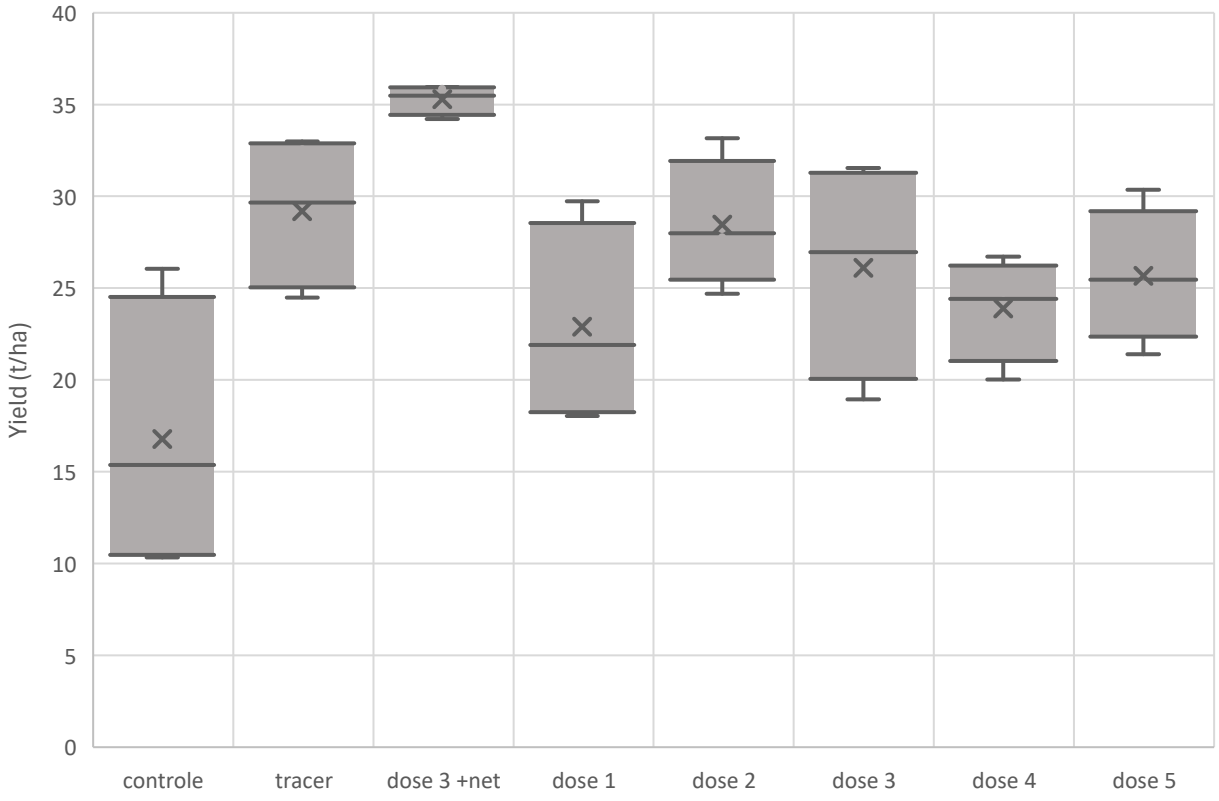
Results 2024

	% marketable	Total weight of marketable cabbage (t/ha)
Untreated	58	16,8
Tracer	94	29,2
BSF Frass (dose 3) + net cover	95	35,3
BSF Frass (dose 1)	84	22,9
BSF Frass (dose 2)	92	28,5
BSF Frass (dose 3)	84	26,1
BSF Frass (dose 4)	78	23,9
BSF Frass (dose 5)	88	25,7



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And in organic production systems?

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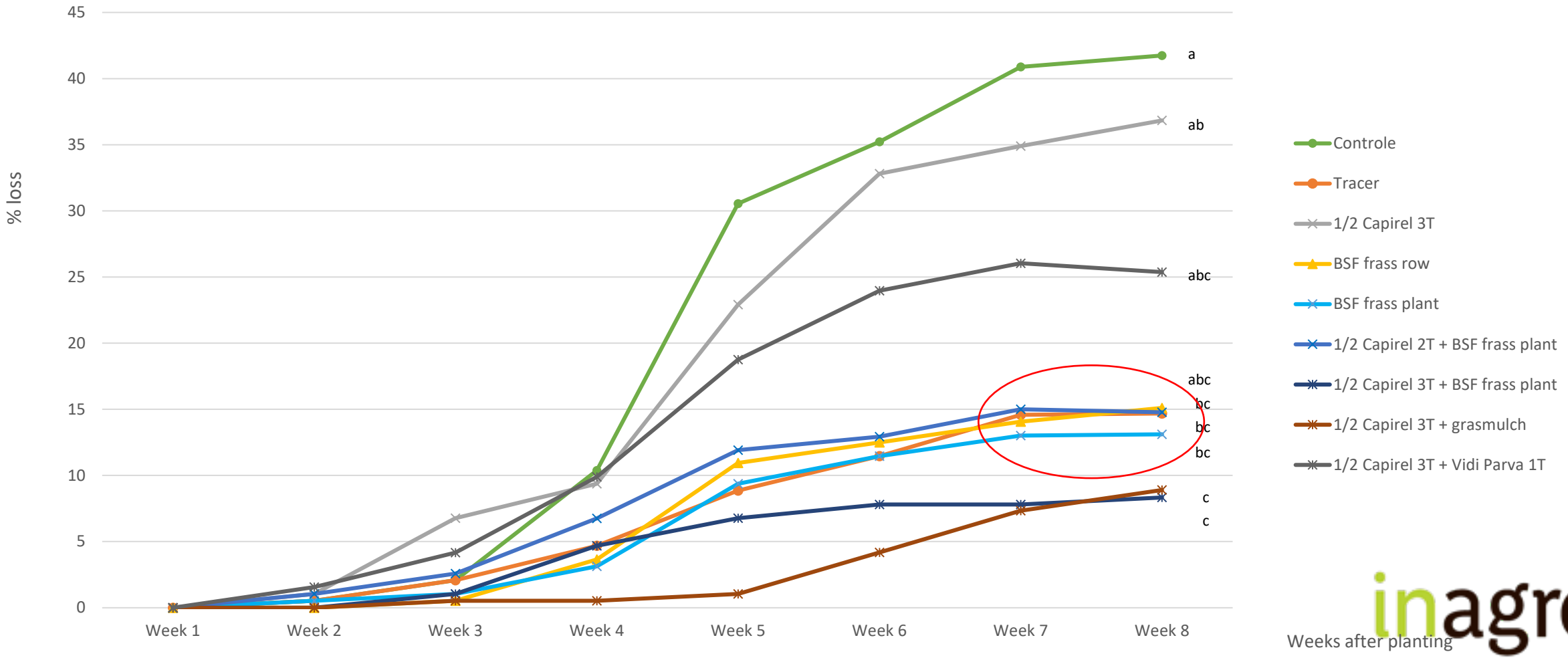
Results 2023



Conclusions

Field trials show that pelletized BSF frass can be used as fertilizer in cabbages

Even in small amounts pelletized BSF frass show a clear effect on CRF infestation.

BUT we observe a similar number of larvae in close proximity of the plant.

What does the future hold?

Projects: Rese(c)t en HiGa

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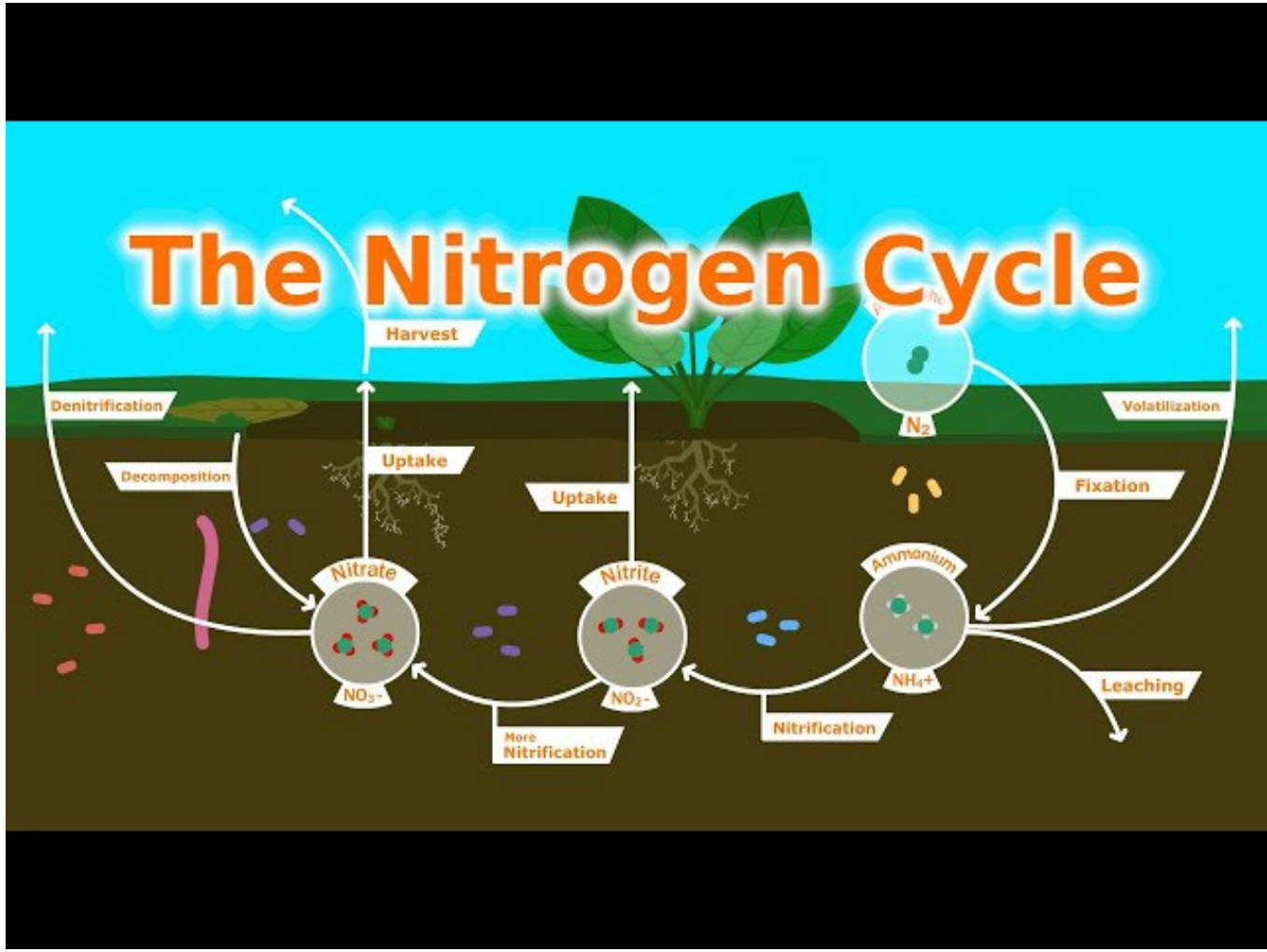
Frass as fertilizer

- How much does the crop need?
- How much in the soil layers?
  - Now
  - Expected
- Fertilizer application
  - What kind of fertilizer?
  - Regulations?



Frass as fertilizer

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BSF NPK-ratio: 3-1-2

YMW NPK-ratio: 5-1-2

BUT…

Depending on nutritional needs of crop

AND… Regulatory limits:

170 kg N/ha

80 kg P/ha

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Use cofactor of manure for N calculations?

Direct uptake %?

Fytotoxicity?

Frass as biostimulant?

Less disease expression in comparison to untreated in winter wheat in 2024 with low dose of BSF frass
(0,5% - 0,3t/ha)

Thank you

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