



**The awareness of carbon farming in the agricultural sector, possible and used techniques and business approaches in the North Sea region**  
**Short report of two surveys (2019 and 2021)**  
**– with data attachment**

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## 1 Introduction

Climate change is happening, and farmers are already affected by weather extremes. Action is needed to limit the temperature increase in the atmosphere to below 2°C. Carbon sequestration in soils and protection of soil organic carbon (SOC) is seen as a promising approach to counteract this and to maintain soil fertility (Minasny et al. 2017). It is therefore important to increase the knowledge and activity amongst farmers. This is the context of the Interreg project *Carbon Farming* in the North Sea Region (<https://northsearegion.eu/carbon-farming/>).

The project partners carried out two surveys at the beginning and end of the project. In 2019 we were interested to evaluate previous thoughts and experiences with measures to preserve and increase carbon storage in soils among farmers. We were also interested to know whether farmers in the North Sea region had heard of this topic and if they were aware of the role of soils in climate change, as well as in their knowledge about the marketing of the associated environmental services. Also, we planned to identify possible chain partners who were interested in supporting the development in soil management to increase SOC. We aimed at drawing attention to further emerging activities on Carbon Farming (political development is summarized under e.g. [https://ec.europa.eu/clima/eu-action/forests-and-agriculture/sustainable-carbon-cycles/carbon-farming\\_de](https://ec.europa.eu/clima/eu-action/forests-and-agriculture/sustainable-carbon-cycles/carbon-farming_de)), and also at recruiting people for the exchange of new ideas and cooperation. Ideas and practical approaches to develop business models for Carbon Farming that might be suitable to contribute to the introduction of SOC friendly farm management should be developed in the project. In the second questionnaire campaign in 2021, we tried to get a rough impression how the awareness and engagement of farmers and other actors developed in the running time of the project over two and a half years and if awareness, knowledge and engagement on the issue Carbon Farming changed.

## 2 Materials and Methods

In 2018/2019 a joint questionnaire was developed in English language (see Supplement 1). It was translated into local languages and spread on agricultural fairs and conferences in the regional context of the project partners, i.e. South-East Norway – NLR, Belgium – Innovatiesteunpunt and Inagro, The Netherlands – ZLTO and Bionext and North Germany – Thuenen and 3N Kompetenzzentrum, and in the period from February to April 2019. Additionally, the questionnaire was provided online at the homepages of some project partners. The links were publicly available or spread as electronic survey in existing local advisory networks (Figure 1). In 2021 the new questionnaires (see Supplement 5) were only provided via link at the homepages in the local languages and/or the link was spread in the local advisory networks. The incoming results were collected in a standard Excel format and answers to open questions were translated to English by the project partners.

In 2019 the general questions on current job and education and the final questions on expectations and further interest were directed to all respondents, questions on farm type, on awareness of the topic Carbon Farming and on techniques and agricultural management were directed to farmers. People who defined themselves as chain partners were led directly to the questions on awareness and knowledge on Carbon Farming and on their expectations for the use of Carbon Farming in marketing. All questions were available to all participants. Due to the self-assessment of the respondents on their role and function or due to double functions a cross over in answers between the two groups of respondents' – farmers and chain partners – couldn't be avoided.

The results of the closed questions of both campaigns are described in the following text, the results by regions and project partners are provided in Supplement 2 and 6. The full results on the open questions are provided in semicolon separated format for further analyses in Supplements 3 and 7. Some interesting points that came to light during the data preparation are mentioned also in the text.

### 3 Results

#### Carbon Farming survey 2019 and 2021

In 2019 the total number of respondents was 539 (Figure 1). In the following text the total number of responses we got to the respective questions are reported as *n* in brackets. 83% of respondents (445 people, incl. double entries in other sectors) worked in the primary production in the agricultural sector (and were expected to answer in the group: farmer). 12% were related to the agricultural sector (experts in advisory, policy, research, associations), 3% of the respondents worked in trade, distribution and processing of food and feed or in production and trade of agricultural equipment (1%) or had a job that is not related to agriculture (2%). This part of respondents (18%, 96 people, incl. double entries as farmers) were expected to answer as chain partners (n=536) (Figure 2). 74% of the respondents had an agricultural education (n=531) and 84% managed a farm (n=536) (Figure 3). Only 19% of them represented organic farming (n=448) (Figure 4). In 2021 156 people answered the questionnaire in the regions (36% Belgium and The Netherlands, 30% Germany, 35% Norway) (Figure 1). 75 % of them were farmers (Figure 2).

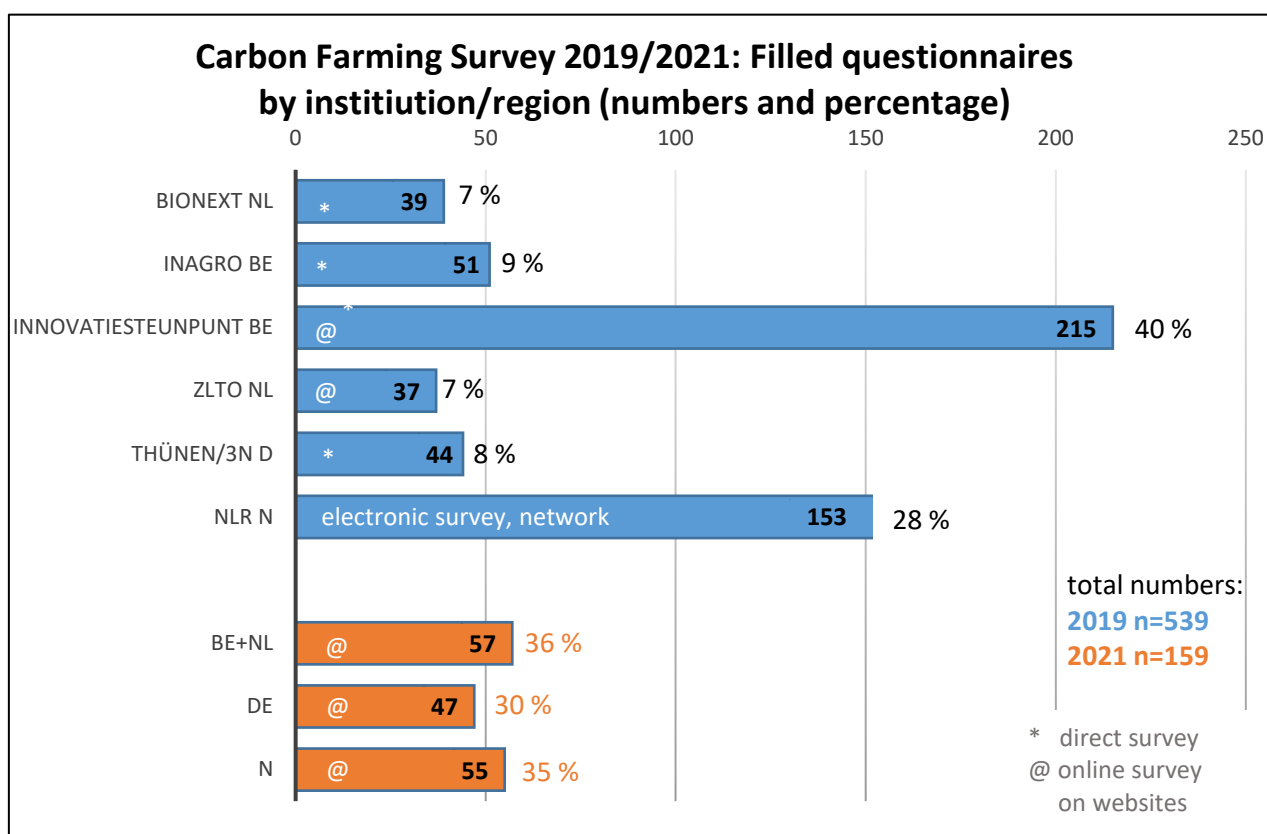
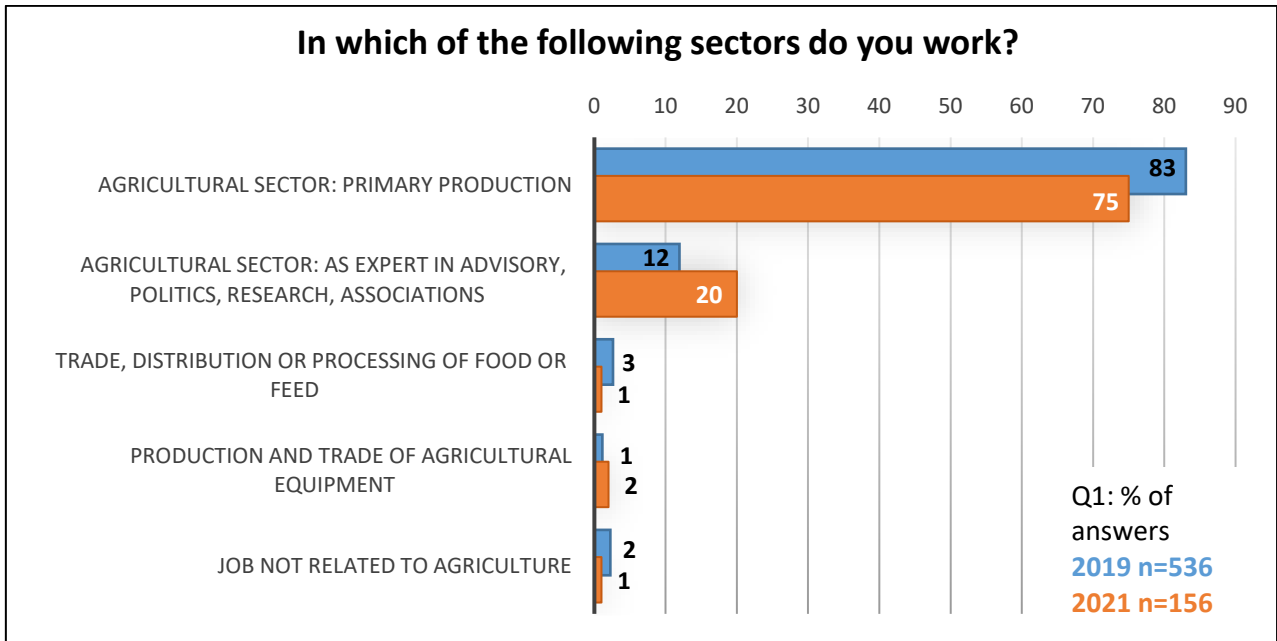
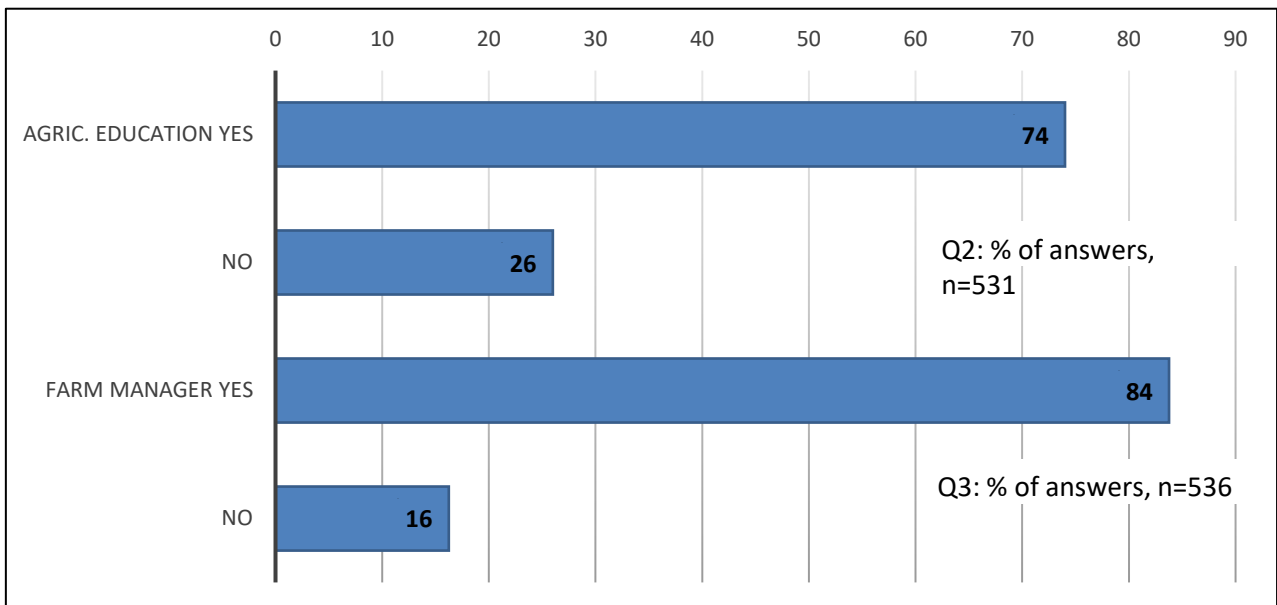


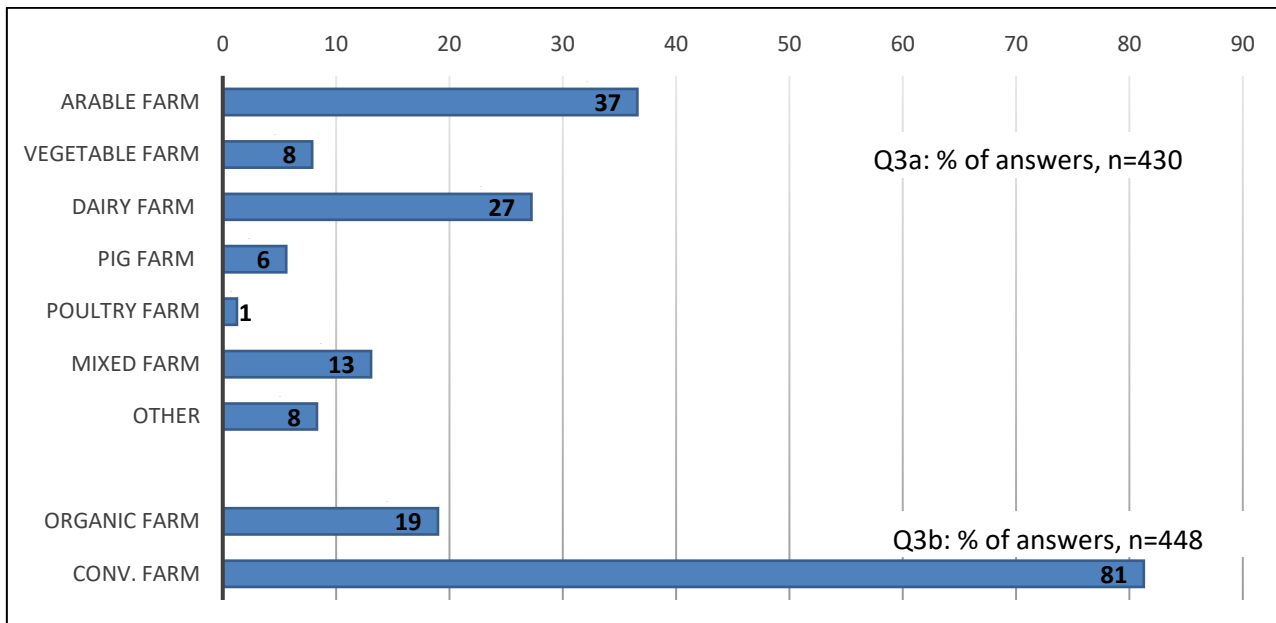
Figure 1: Carbon Farming Survey 2019 and 2021: Filled questionnaires by institution (total numbers and percentage of answers)



**Figure 2: Carbon Farming Survey 2019 and 2021: Answers to question: In which of the following sectors do you work? (percentage of answers)**

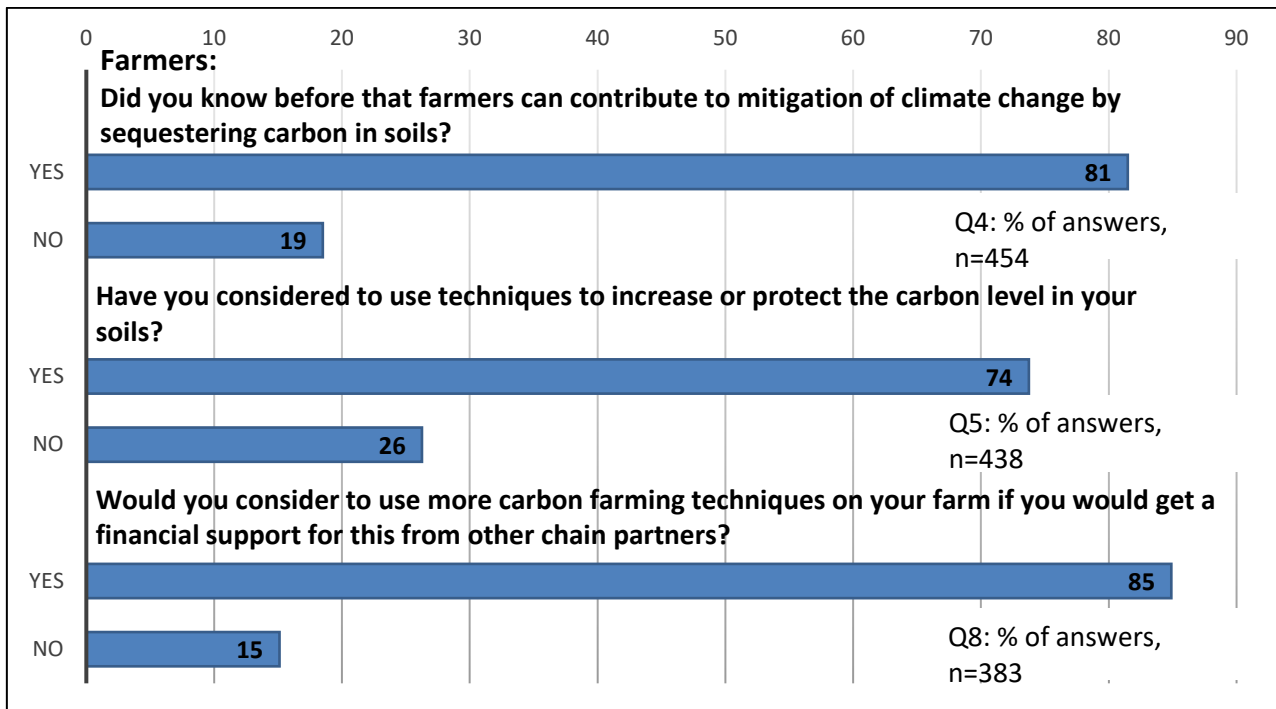


**Figure 3: Carbon Farming Survey 2019: Answers to questions: Do you have an agricultural education? Do you manage a farm? (percentage of answers)**

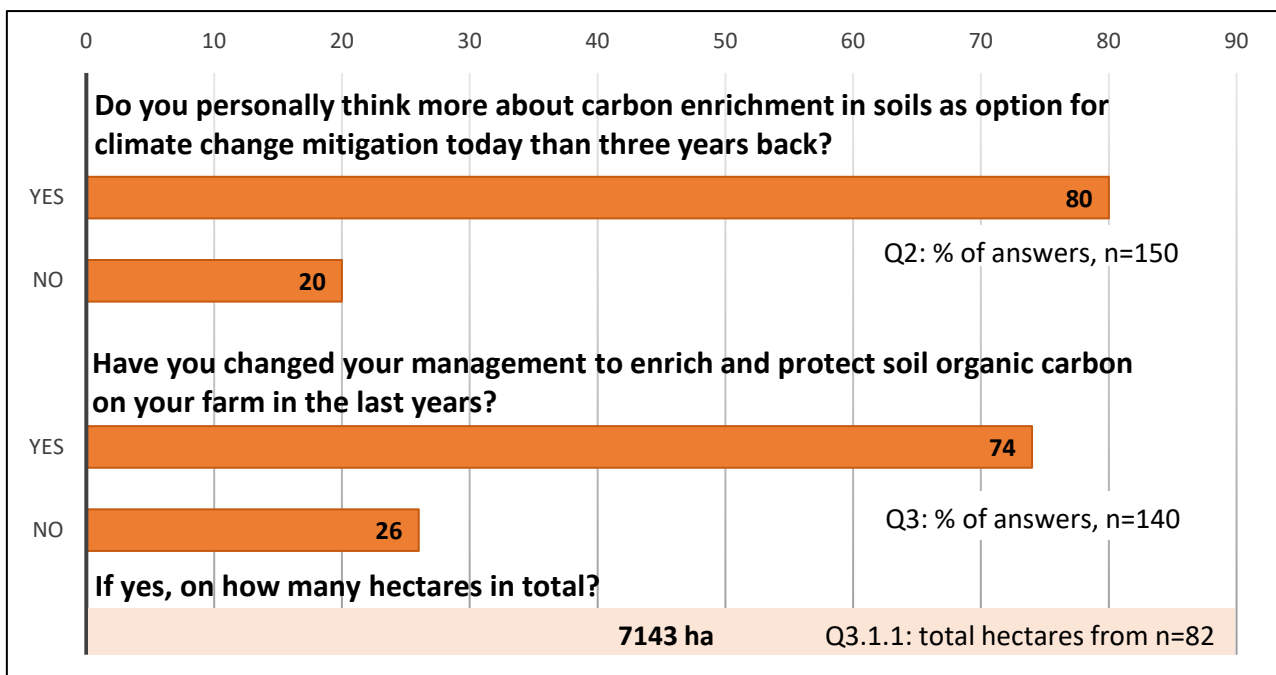


**Figure 4: Carbon Farming Survey 2019: Answer to question: Please indicate which type of farm you have (percentage of answers)**

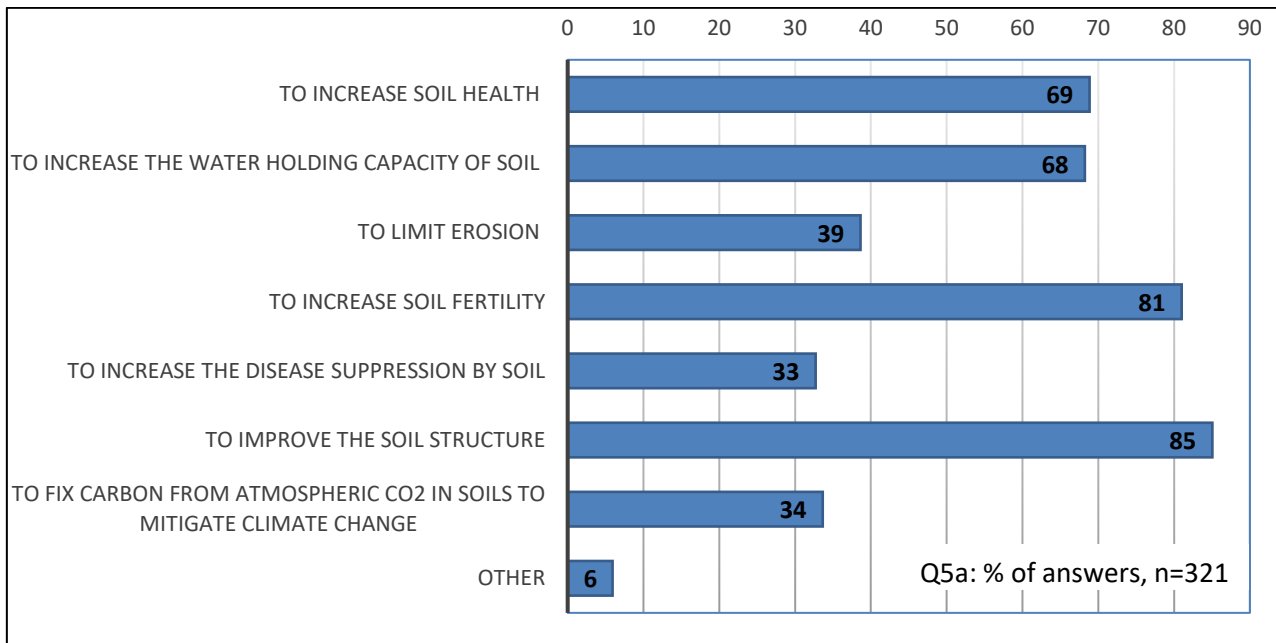
The survey in 2019 showed that 81% of the farmers (n=454) knew about the possibility of farmers to mitigate climate change with C sequestration and 85% would consider using more new Carbon Farming techniques if they would get financial support from other chain partners (n=383) (Figure 5). The main reasons of farmers to use techniques for increasing or protecting SOC levels were to improve soil structure (85% of answers), to increase soil fertility (81%), to increase soil health (69%) and water holding capacity (68%). Only 34% of the respondents answered that they were motivated to use techniques for SOC protection and enrichment due to the possibility to mitigate climate change by moving C from the atmospheric CO<sub>2</sub> in soils to (n=321) (Figure 6). In 2021, 80% of the respondents agreed they are more aware of the opportunity to help the climate with carbon accumulation in soils than three years earlier. 75% said that they changed their soil management in the last years accordingly, this was done on 7143 ha in the North Sea Region (Figure 5a). 85 people gave examples for techniques they use (full answers to question 3.1 see Supplement 7). 59 respondents gave reasons why they haven't changed management. The answers ranged from "no belief in this" or "Humus ... that is really nothing new. Therefore, in my opinion, the term "carbon farming" should not be used to raise false expectations in civil society about the potential of such measures in terms of climate protection." Also, aspects of missing knowledge and low economic expectations were mentioned (full answers to question 4.2, see Supplement 7).



**Figure 5:** Carbon Farming Survey 2019: Answers to questions on awareness, on consideration to use techniques and on the role of potential financial support for introducing carbon farming techniques (percentage of answers)

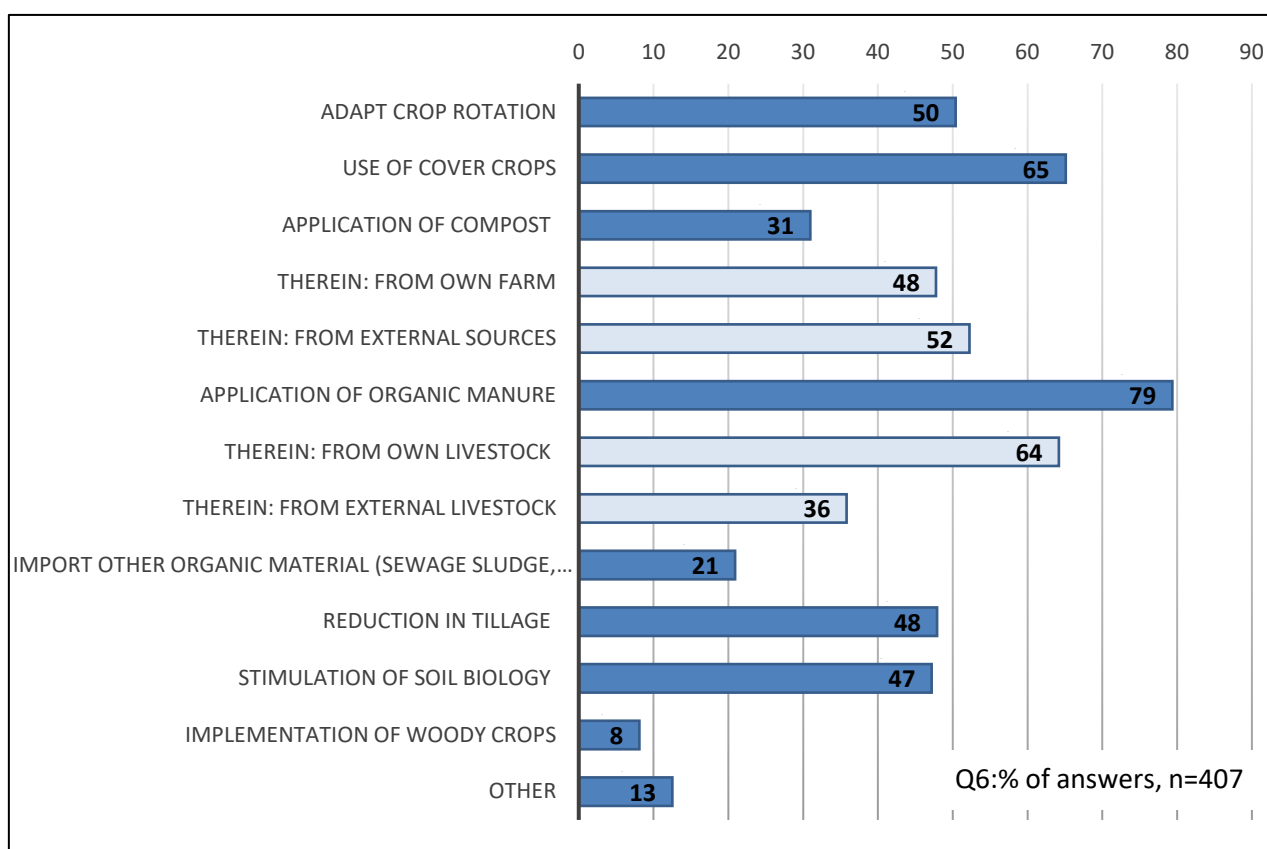


**Figure 5a:** Carbon Farming Survey 2021: Answers to questions on raised awareness on soil carbon as tool for climate change mitigation, related changes in management (percentage of answers) and converted area



**Figure 6: Carbon Farming Survey 2019: Answers to questions on motivation for introduction of Carbon Farming measures: Have you considered to use techniques to increase or protect the carbon level in your soils? If yes, please indicate the reason below. (percentage of answers, multiple answers were possible)**

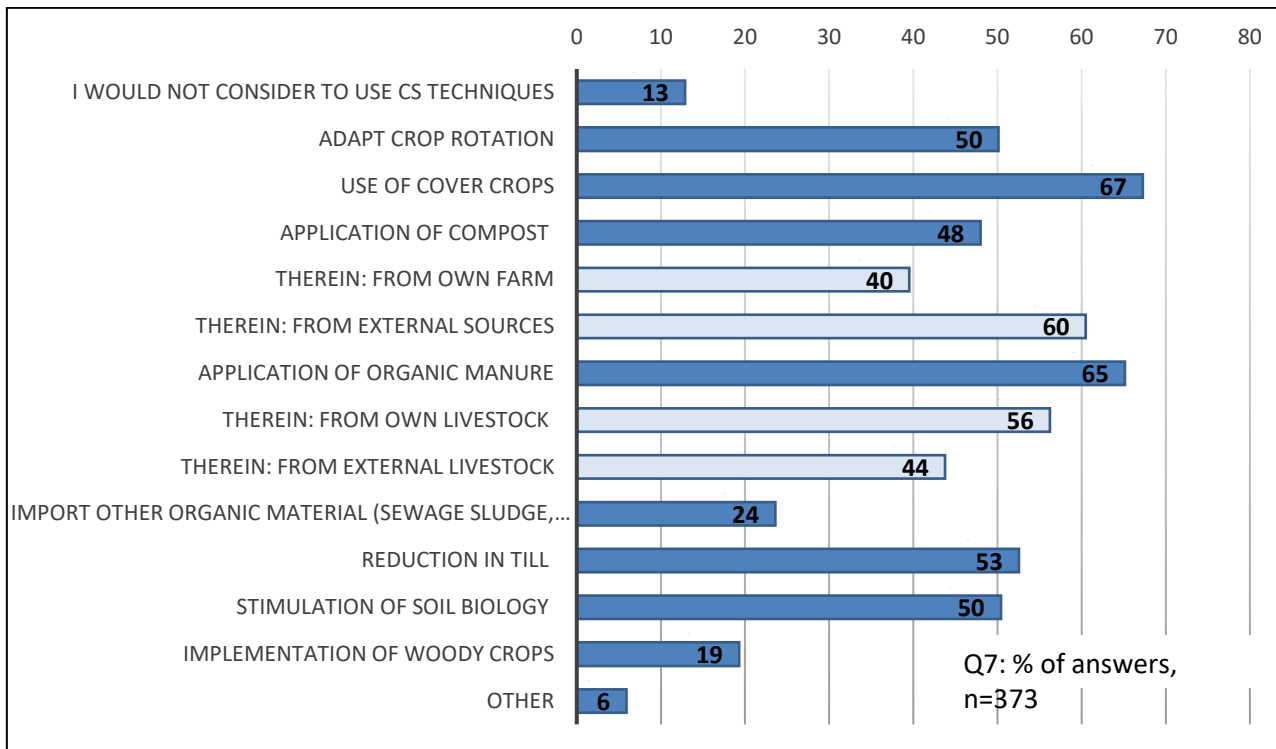
When asking for the techniques the farmers currently use to increase SOC, application of organic manure (79% of answers) and use of cover crops (65%) were most prominent in 2019. Import of organic matter from external sources (livestock manure, compost and e.g. sewage sludge (especially in Norway, see Supplement 2) was important for 29% (i.e. 79\*36%), 16% and 21% of the farms, respectively. Adapting crop rotation and reduction in tillage was mentioned in 50% of the entries. Woody crops were mentioned by 8% of respondents (n=373) (Figure 7).



**Figure 7: Carbon Farming Survey 2019: Answers to question: Which techniques to increase the carbon level in your soils do you use? (percentage of answers, multiple answers were possible)**

When asking which techniques to increase the SOC level would be of interest for farmers, 13% answered that they would not consider using these techniques. The choice of the other options generally had comparable trends (n=407) (Figure 8) as found in the question on the current use of techniques before (Figure 7).

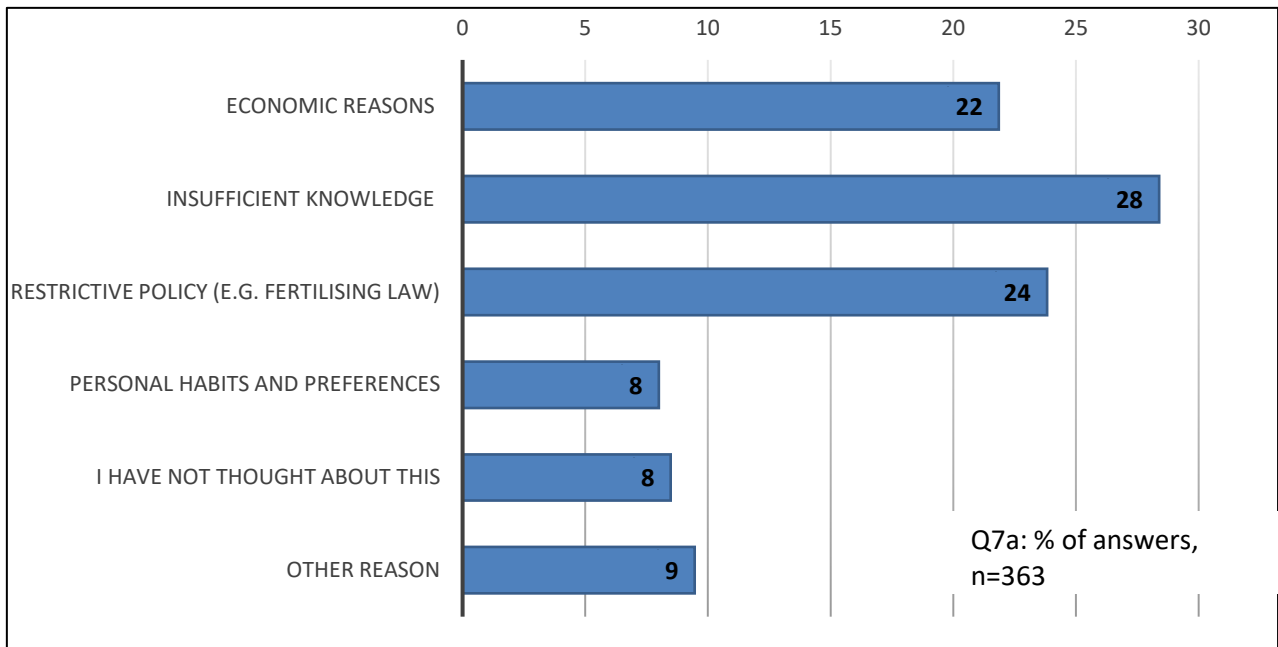




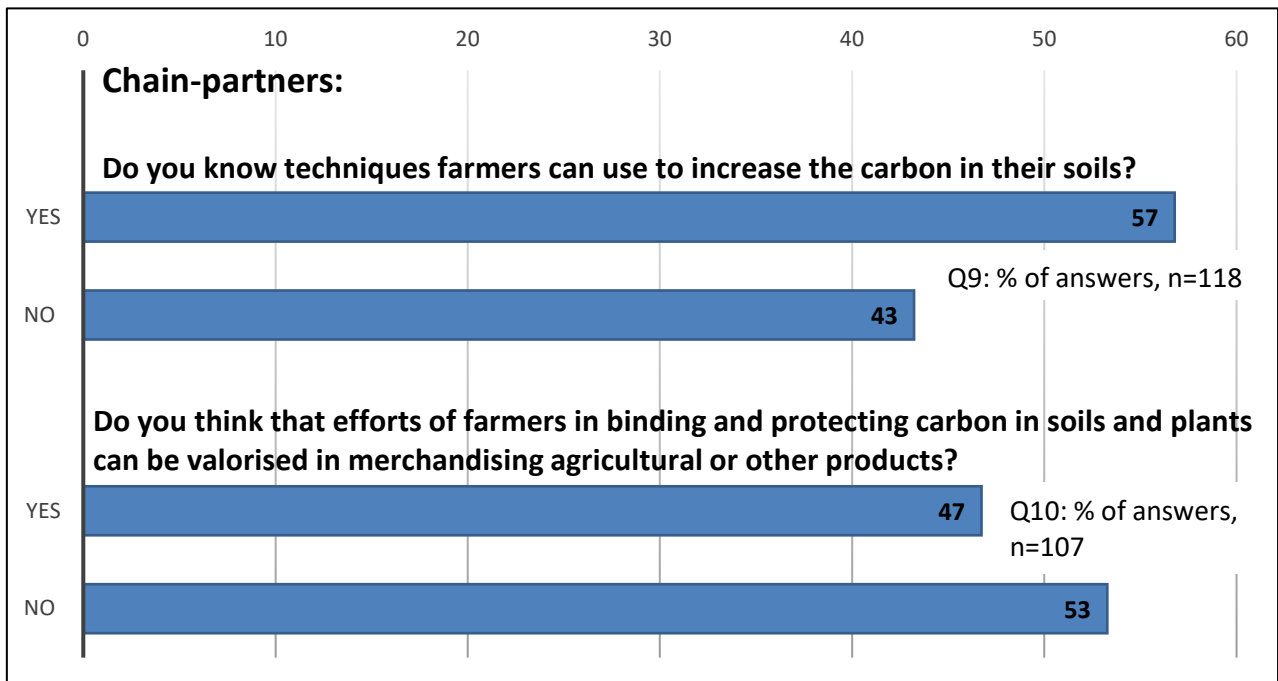
**Figure 8: Carbon Farming Survey 2019 (Q7): Answers to question: Which techniques to increase the carbon level would be of interest to you? (numbers and percentage of answers, multiple answers were possible)**

When the farmers were asked what reasons prevent them from taking measures to increase SOC, insufficient knowledge (28% of answers), restrictive policy (24%) and economic reasons (28%) were named as the most important in 2019 (n=363) (Figure 9).

Asking the chain partners on their knowledge on carbon farming techniques and chances of SOC binding as merchandising aspect in 2019 we got between 107 to 118 answers (Figure 10). Compared to the expected number of answers from the persons who were defined as chain partners (96, see above figure 2) this means that a significant amount of responses of farmers are included. 57% of these respondents answered that they knew techniques farmers can use to increase SOC (n=118). Concerning the chances of getting added value by the increased efforts of farmers in merchandizing products, the expectations were indifferent with 53% voting with “no” and 47% with “yes” (n=118) (Figure 10).

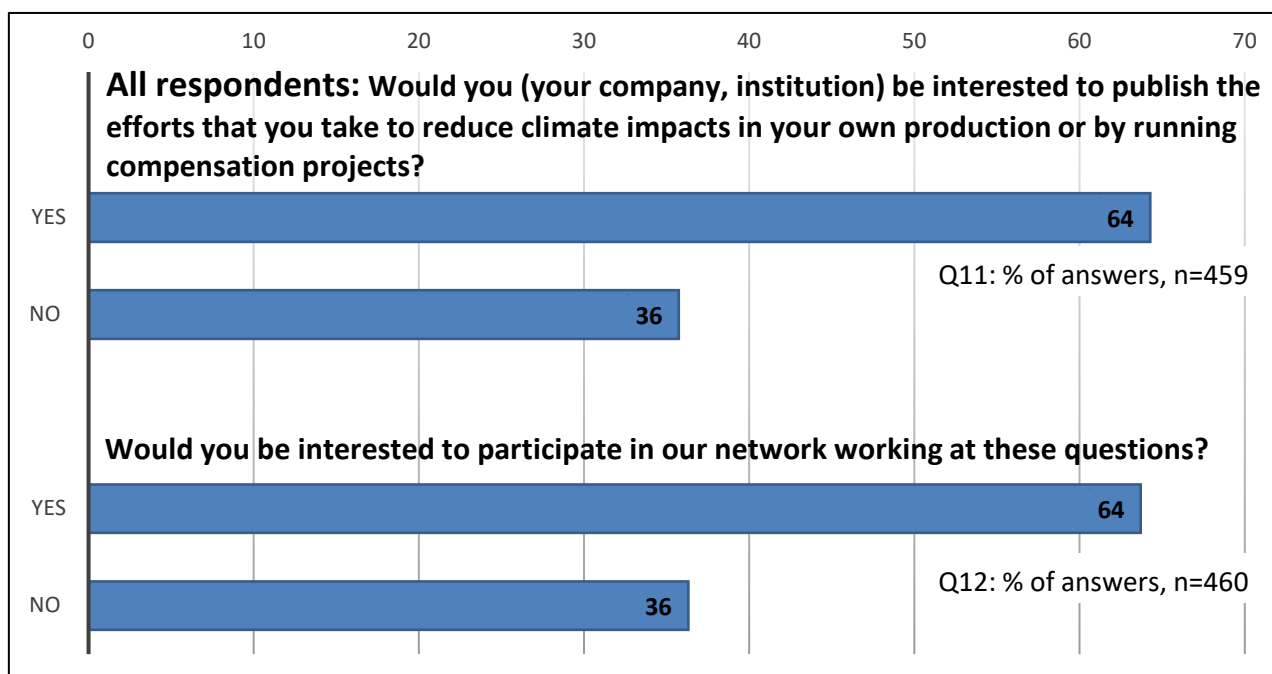


**Figure 9:** Carbon Farming Survey 2019 (Q7a): What is actually preventing you from taking measures to improve carbon levels in soil? (numbers and percentage of answers, multiple answers were possible)

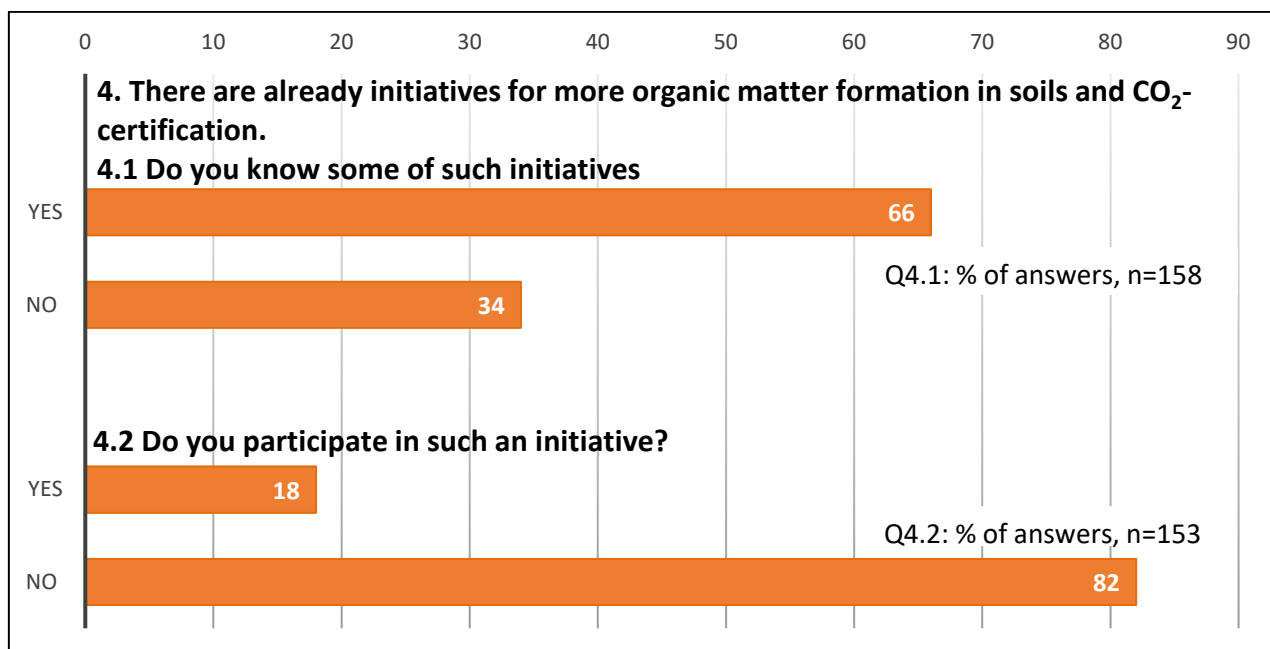


**Figure 10:** Carbon Farming Survey 2019 (Q9, Q10): Answers to questions to chain partners on the current knowledge of techniques to increase carbon in farm soils and on the possible role of these efforts in marketing of agricultural and other products (Q10) (numbers and percentage of answers)

In 2019 64% of all respondents were interested to publish the efforts they take to reduce climate impacts (n=459) and further 64% answered that they were interested to participate in the project network (n=460) (Figure 11). Three years later in 2021, 66% of the respondents were aware of local carbon farming initiatives and 18% were directly engaged (28 from 153 respondents) (Figure 12). They mentioned different initiatives that are promoting Carbon Farming, some networks for improved soil management or that they would use direct or written advisory services to introduce appropriate measures (around 20 different entries, see Supplement 7, answers to question 4.2).



**Figure 11:** Carbon Farming Survey 2019 (Q11, Q12): Answers to questions on the interest of farms and institutions to report the actions that are taken to reduce climate impacts and 12 on the interest of collaboration in the Interreg Project Carbon Farming (numbers and percentage of answers)



**Figure 12:** Carbon Farming Survey 2021 (Q4.1, Q4.2): Answers to questions on knowlegde of carbon farming initiatives and on current participation (numbers and percentage of answers)

## 4 Discussion and Conclusion

First, it must be mentioned that the data we collected in 2019 and 2021 is not representative for the complete North Sea Region as the selection of the sample analysed followed no statistical procedure. So, the results offer a view on current thoughts and knowledge of farmers and stakeholders in the regional and institutional context of the project partners. Due to the efficient online and electronic survey of two project partners in 2019, the results are dominated by answers from farmers in Belgium and Norway in this year (Figure 1). Regional differences and ideas might be evaluated further by the full data given in Supplements 2, 3, 6 and 7.

In 2019 we were interested in evaluating thoughts and experiences of farmers on measures to preserve and increase carbon storage in soils. With 19 % of farmers from organic farms, organic farming might be over-represented compared to the current numbers of organic farmers in the named counties (Figure 4). (The Netherlands 3.7% organic area, 1867 organic producers, Norway 4.6% organic area, 1976 organic producers, Belgium 6.9% organic area, 2394 producers, Germany 9,7% organic area, 34136 producers (Willer et al. 2021)).

In 2019 the farmers were aware of standard techniques to improve SOC contents in soils (Figure 7 and 8) and mentioned further techniques that are currently under discussion, e.g. the use biochar from pyrolysis (Busch and Glaser 2015;Smith 2016). Also, the role of careful soil tillage, soil cover, recycling of straw and organic matter in farms and landscapes (e.g. including material from forests) as well as integration of meadows and grazing in arable crop rotations, but also the need for a combination of these measures were highlighted in the answers to the open questions. The need for more information and clear advice became obvious when assessing the answers (Supplement 3).

The farmers in the North Sea region were generally aware of the possibility to contribute to mitigation of climate change by enhancing SOC (84%, Figure 4). They were also aware of the costs of introducing an improved soil management. and felt they had insufficient knowledge and were restricted by policy and related management regulations (Figure 9). They were interested in new income possibilities that might be given by other chain

partners (Figure 5). The chain partners were reluctant when asked for the possibilities they see for new business models for improving, SOC protection and binding in the farms, as well as for marketing of products (Figure 10).

From the survey in 2021, we got a rough impression on how the awareness and engagement of farmers and other actors had developed during the project of two and a half years. According to the respondents, the awareness of the use of carbon farming and increase of SOC to relieve the climate, has been raised. This results need to be assessed in the light of (1) the activities of the EU to provide a clear and reliable framework for carbon farming (EU COM 2021) emerging in parallel from the beginning of the Interreg project, (2) the raising activities of private initiatives in that time, (3) our own public activities in the Interreg NSR project while exploring business models and techniques (4) and of the probable bias created by addressing a group of already engaged and interested participants in the agricultural sector. However, based on the results of the two surveys in 2019 and 2021, we can provide an insight to the actual knowledge and interest in Carbon Farming for climate protection in agriculture in the North Sea Region.

## Literature

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**Supplement 1** - The awareness of carbon farming in the agricultural sector, possible and used techniques and business approaches in the North Sea region. Short report of two surveys (2019 and 2021): **Carbon Farming Survey 2019 – Questionnaire from 19.01.2019**. NSR Interreg Project Carbon Farming.

Dear farmer, entrepreneur, expert.

Climate change is high on the agenda and farmers already face weather extremes. Action needs to be undertaken to keep the temperature increase in the atmosphere below 2°C. Carbon binding in soils is a promising approach to reduce pressure on the atmosphere. As carbon protection and carbon enrichment in soils also can help to keep soil fertility and soil functionality farmers should take action. They could be supported by new business models with other societal partners paying for their efforts.

We are agricultural experts from agricultural science and advisory who collaborate in the Carbon Farming project and would like to explore your awareness, experience and interest on the options mentioned above.

In the following you find a basic survey which shall

- check the existent awareness and skills to take action for carbon sequestration in soil
- enable us to identify people who are interested to go in this direction and further develop and exchange ideas on practical ways for carbon enrichment in soils in a network.

Filling this questions is without any further obligation for you. You can stay anonymous. But if you are interested to develop ideas or to share knowledge, you are invited to leave contact data or contact us.

Thank you very much for answering the following questions.

On behalf of the project team,

..  
..

## **General Questions (1-3b)**

### **1 In which of the following sectors do you work? (only one choice)**

- Agricultural sector: primary production
- Agricultural sector: as expert in advisory, politics, research, associations
- Trade, distribution or processing of food or feed
- Production and trade of agricultural equipment
- Job not related to agriculture

### **2 Do you have an agricultural education?**

Yes  No

### **3 Do you manage a farm?**

Yes  No

#### **3a. If yes, please indicate which type of farm:**

- Arable farm
- Vegetable farm
- Dairy farm
- Pig farm
- Poultry farm
- Mixed farm: please specify \_\_\_\_\_

Other: \_\_\_\_\_

**3b. If yes, do you have an organic farm?**

Yes  No

**4 Did you know before that farmers can contribute to mitigation of climate change by sequestering carbon in soils?**

Yes  No

**If you manage a farm, go for the questions for farmers (Questions 5 – 8c)**

**If you do not manage a farm, go for questions for chain partners (Questions 9 – 10a)**

**Questions for farmers (5 – 8c)**

**5 Have you considered to use techniques to increase or protect the carbon level in your soil?**

Yes  No

**5a If yes, please indicate the reason below. (you can choose multiple options)**

- A) to increase soil health
- B) to increase the water holding capacity of soil
- C) to limit erosion
- D) to increase soil fertility
- E) to increase the disease suppression by soil
- F) to improve the soil structure
- G) to fix carbon from atmospheric CO<sub>2</sub> in soils to mitigate climate change
- H) other: \_\_\_\_\_

**5b Please give a ranking of the importance of the reasons for you (e.g. C, D, F):**

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**6 If you use techniques to increase the carbon level in your soils, which techniques do you use? (you can choose multiple options)**

- adapt crop rotation (extra space to fill in how..)
  - If yes, please specify how:
- use of cover crops:
  - If yes: please give which cover crops are used and the preceding crop:  
\_\_\_\_\_  
\_\_\_\_\_



- 
- application of compost
    - from your own farm
    - apply external
  - application of organic manure
    - from own livestock
    - apply external livestock manure
  - import other organic material (sewage sludge, industrial organic wastes)  
- if yes, which other materials: \_\_\_\_\_

- reduction in tillage  
- if yes how: \_\_\_\_\_

- stimulation of soil biology  
- if yes how: \_\_\_\_\_

- implementation of woody crops
- other: \_\_\_\_\_

**7 Which techniques would be of interest to you to increase the carbon level in your soils?  
(you can choose multiple options)**

- I would not consider to use CS techniques
- adapt crop rotation
  - if yes, how:... \_\_\_\_\_
- use of cover crops
  - if yes, which: \_\_\_\_\_
- application of compost
  - from your own farm
  - apply external
- application of organic manure
  - from own livestock
  - apply external livestock manure
- import other organic material (sewage sludge, industrial organic wastes)  
If yes, which materials \_\_\_\_\_

reduction in till

- if yes how: \_\_\_\_\_

stimulation of soil biology

- if yes how: \_\_\_\_\_

implementation of woody crops

other: \_\_\_\_\_

**7a What is actually preventing you from taking measures to improve carbon levels in soil?  
(you can choose multiple options)**

A) economic reasons

B) insufficient knowledge

C) restrictive policy (e.g. fertilising law)

D) personal habits and preferences

E) I have not thought about this

F) other reasons \_\_\_\_\_

**8 There are several examples for carbon offset programs and projects worldwide where people transfer money to fight climate change or to compensate for emissions, e.g. promotion of energy efficient cooking stoves, renewable energy programs, afforestation projects.**

**Would you consider to use more techniques to increase the carbon sequestration in soils and plants on your farm if you would get a financial support for this from other chain partners (not from subsidies)?**

Yes  No

**8a Which measures to bind carbon in soil could be paid for in your opinion?**

\_\_\_\_\_

**8b To get paid for, it is necessary that it can be verified what you have done to increase carbon binding in soils. Which measures to bind carbon in soil do you think are possible to verify? And how? Give examples**

\_\_\_\_\_

**8c If you have an idea for a business model to get paid for measures to increase carbon storage in soils, please write here below:**

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**Farmers: Finish with question 11 to 12a.**

### **Questions for Chain-Partners (9-10a)**

**9 Do you know techniques farmers can use to increase the carbon in their soils?**

Yes  No

**9a If yes, please give some examples**

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**10 There are several examples for carbon offset programs and projects worldwide where people transfer money to fight climate change or to compensate emissions, e.g. promotion of energy efficient cooking stoves, renewable energy programs, afforestation projects.**

**Do you think that the effort of farmers in binding and protecting carbon in soils and plants can be valorised in merchandising agricultural or other products?**

Yes  No

**10a If yes, how do you think the effort of farmers in sequestering carbon can be used in merchandising agricultural or other products?**

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**Chain partners: finish with question 11 to 12a.**

### **Final Questions for all**

**11 Would you (your firm, company, institution) be interested to publish the efforts that you (your firm, company, institution) take to reduce climate impacts in your own production or by running compensation projects.**

Yes  No

**12 To exchange and learn about suitable measures aiming to increase carbon binding in farm soils (carbon farming) and to develop business cases for these measures to valorise carbon farming in merchandising:**

**Would you be interested to participate in our network working at these questions?**

Yes  No

**12a If yes, please offer your: E-Mail, Phone number, Name, Address**

E-Mail: \_\_\_\_\_

Phone: \_\_\_\_\_

Name: \_\_\_\_\_

Country: \_\_\_\_\_

Address: \_\_\_\_\_

Your personal data will be treated confidentially. Your answers will be used for a report and cannot be connected to your identity.

If you have left your contact data we'll inform you about the results of this survey and maybe we contact you for further discussions on Carbon Faming.

**Supplement 2** - The awareness of carbon farming in the agricultural sector, possible and used techniques and business approaches in the North Sea region  
Short report of two surveys (2019 and 2021): **Carbon Farming Survey 2019 - All answers to closed questions by institutions.** NSR Interreg Project Carbon Farming.

*Abbreviations for institutions: NLR – Norsk Landbruksrådgiving, Norway; Thuenen/3N – Thünen-Institute of Organic Farming and 3N Kompetenzzentrum, Germany; Inagro – Inagro, Belgium; Bionext – Stichting Bionext, The Netherlands; ZLTO – Southern Agriculture and Horticulture Organization, The Netherlands; Innov – Innovatiesteunpunt, Belgium*

Survey Carbon Farming 2019		All		NLR		Thünen/3N		Inagro		Bionext		ZLTO		Innovatie	
		%	n	%	n	%	n	%	n	%	n	%	n	%	n
<b>Filled Questionnaires</b>		100	539	28	153	8	44	9	51	7	39	7	37	40	215
<b>General Questions (1-3)</b>															
<b>1 In which of the following sectors do you work?</b>	<i>Answers</i>		536		153		43		49		39		37		215
Agricultural sector: primary production		83	445	95	146	74	32	92	45	62	24	86	32	77	166
Agricultural sector: as expert		12	64	2	3	16	7	12	6	8	3	14	5	19	40
Trade, distribution or processing of food or feed		3	14	0	0	2	1	2	1	28	11	3	1	0	0
Production and trade of agricultural equipment		1	6	3	4	5	2	0	0	0	0	0	0	0	0
Job not related to agriculture		2	12	0	0	5	2	0	0	3	1	0	0	4	9
	<i>All</i>		541		153		44		52		39		38		215
<b>2 Do you have an agricultural education?</b>	<i>Answers</i>		531		152		41		49		37		37		215
Yes		74	393	63	95	93	38	92	45	76	28	84	31	73	156
No		26	138	38	57	7	3	8	4	24	9	16	6	27	59
	<i>All</i>		531		152		41		49		37		37		215
<b>3 Do you manage a farm?</b>	<i>Answers</i>		536		153		43		49		39		37		215
Farm Manager Yes		84	449	100	153	74	32	86	42	62	24	81	30	78	168
No		16	87	0	0	26	11	14	7	38	15	19	7	22	47
	<i>All</i>		536		153		43		49		39		37		215
<b>3a If yes, please indicate which type of farm:</b>	<i>Answers</i>		430		153		32		43		23		27		152
Arable farm		37	176	40	61	31	12	39	34	17	4	78	21	29	44
Vegetable farm		8	38	8	13	5	2	16	14	13	3	0	0	4	6
Dairy Farm		27	131	31	48	18	7	30	26	13	3	0	0	31	47
Pig Farm		6	27	7	10	8	3	9	8	4	1	4	1	3	4
Poultry Farm		1	6	2	3	0	0	2	2	4	1	0	0	0	0
Mixed Farm		13	63	9	14	31	12	5	4	35	8	15	4	14	21
Other		8	40	3	4	8	3	0	0	13	3	4	1	19	29
	<i>All</i>		481		153		39		88		23		27		151
<b>3b If yes, do you have an organic farm?</b>	<i>Answers</i>		448		153		33		45		24		30		163
Organic Farm		19	85	24	36	27	9	2	1	100	24	13	4	7	11
Conv. Farm		81	364	76	117	73	24	100	45	0	0	87	26	93	152
	<i>All</i>		449		153		33		46		24		30		163

		All		NLR		Thünen/3N		Inagro		Bionext		ZLTO		Innovatie	
		%	n	%	n	%	n	%	n	%	n	%	n	%	n
<b>4 Did you know before that farmers can contribute to mitigation of climate change by sequestering carbon in soils?</b>															
	<i>Answers</i>		454		152		39		47		24		29		163
Yes		81	370	82	125	79	31	77	36	83	20	97	28	80	130
No		19	84	18	27	21	8	23	11	17	4	3	1	20	33
	<i>All</i>		454		152		39		47		24		29		163
<b>Questions for farmers (5 – 8c)</b>															
<b>5 Have you considered to use techniques to increase or protect the carbon level in your soils?</b>															
	<i>Answers</i>		438		150		28		45		23		29		163
Yes		74	323	61	92	93	26	80	36	78	18	86	25	77	126
No		26	115	39	58	7	2	20	9	22	5	14	4	23	37
	<i>All</i>		438		150		28		45		23		29		163
<b>5a If yes, please indicate the reason below (you can choose multiple options).</b>															
	<i>Answers</i>		321		91		28		36		19		26		121
to increase soil health		69	221	69	63	71	20	56	20	68	13	77	20	70	85
to increase the water holding capacity of soil		68	219	54	49	57	16	67	24	89	17	77	20	77	93
to limit erosion		39	124	51	46	50	14	44	16	16	3	12	3	35	42
to increase soil fertility		81	260	70	64	93	26	72	26	89	17	77	20	88	107
to increase the disease suppression by soil		33	105	35	32	29	8	31	11	42	8	58	15	26	31
to improve the soil structure		85	273	79	72	82	23	78	28	84	16	96	25	90	109
to fix carbon from atmospheric CO2 in soils to mitigate climate change		34	108	53	48	29	8	17	6	63	12	46	12	18	22
other		6	19	5	5	7	2	11	4	16	3	19	5	0	0
	<i>All</i>		1329		379		117		135		89		120		489

	All		NLR		Thünen/3N		Inagro		Bionext		ZLTO		Innovatie	
	%	n	%	n	%	n	%	n	%	n	%	n	%	n
<b>6 If you use techniques to increase the carbon level in your soils, which techniques do you use? (you can choose multiple options)</b>														
<i>Answers</i>		407		142		30		41		23		29		142
adapt crop rotation	50	205	52	74	63	19	46	19	26	6	34	10	54	77
use of cover crops	65	265	31	44	63	19	85	35	48	11	97	28	90	128
application of compost	31	126	27	39	30	9	5	2	39	9	45	13	38	54
therein: from own farm	48	64	84	31	11	1	38	5		0	14	2	41	25
therein: from external sources	52	70	16	6	89	8	62	8		0	86	12	59	36
application of organic manure	79	323	72	102	87	26	37	15	78	18	83	24	97	138
therein: from own livestock	64	242	73	74	78	21	67	32		0	38	10	60	105
Therein: from external livestock	36	135	27	27	22	6	33	16		0	62	16	40	70
import other organic material (sewage sludge, industrial organic wastes)	21	85	36	51	17	5	7	3	17	4	17	5	12	17
reduction in tillage	48	195	49	69	40	12	24	10	65	15	62	18	50	71
stimulation of soil biology	47	192	47	67	33	10	32	13	22	5	38	11	61	86
implementation of woody crops	8	33	0	0	7	2	10	4	26	6	7	2	13	19
other	13	51	11	16	10	3	20	8	17	4	10	3	12	17
<i>All</i>		1475		462		105		109		78		114		607



	All		NLR		Thünen/3N		Inagro		Bionext		ZLTO		Innovatie	
	%	n	%	n	%	n	%	n	%	n	%	n	%	n
<b>7 Which techniques would be of interest to you to increase the carbon level in your soils? (you can choose multiple options)</b>														
<i>Answers</i>		373		148		23		36		12		28		126
I would not consider to use CS techniques	13	48	0	0	4	1	3	1	0	0	25	7	31	39
adapt crop rotation	50	187	47	70	61	14	39	14	17	2	36	10	61	77
use of cover crops	67	251	57	84	57	13	50	18	0	0	71	20	92	116
application of compost	48	179	66	98	39	9	25	9	8	1	29	8	43	54
therein: from own farm	40	49		0	13	1	33	3		0	27	3	44	42
therein: from external sources	60	75		0	88	7	67	6		0	73	8	56	54
application of organic manure	65	243	86	127	61	14	28	10	8	1	64	18	58	73
therein: from own livestock	56	194	61	77	71	10	63	12		0	19	4	55	91
therein: from external livestock	44	151	39	50	29	4	37	7		0	81	17	45	73
import other organic material (sewage sludge, industrial organic wastes)	24	88	39	58	4	1	6	2	17	2	18	5	16	20
reduction in till	53	196	57	85	48	11	17	6	67	8	64	18	54	68
stimulation of soil biology	50	188	49	72	39	9	22	8	25	3	39	11	67	85
implementation of woody crops	19	72	21	31	22	5	0	0	42	5	11	3	22	28
other	6	22	0	0	13	3	0	0	0	0	14	4	12	15
<i>All</i>		1943		752		102		96		22		136		835
<b>7a What is actually preventing you from taking measures to improve carbon levels in soil? (you can choose multiple options)</b>	<i>Answers</i>	363		135		24		39		17		28		120
A) economic reasons	22	134	23	46	23	11	13	7	14	4	24	13	23	53
B) insufficient knowledge	28	174	42	83	27	13	11	6	25	7	11	6	26	59
C) restrictive policy (e.g. fertilising law)	24	146	6	12	25	12	38	21	18	5	35	19	34	77
D) personal habits and preferences	8	49	6	11	6	3	14	8	14	4	17	9	6	14
E) I have not thought about this	8	52	14	27	8	4	9	5	0	0	4	2	6	14
F) other reason	9	58	10	19	10	5	16	9	29	8	9	5	5	12
<i>All</i>		613		198		48		56		28		54		229

		All		NLR		Thünen/3N		Inagro		Bionext		ZLTO		Innovatie	
		%	n	%	n	%	n	%	n	%	n	%	n	%	n
<b>8 There are several examples for carbon offset programs and projects worldwide where people transfer money to fight climate change or to compensate for emissions, e.g. promotion of energy efficient cooking stoves, renewable energy programs, afforestation projects. Would you consider to use more techniques to increase the carbon sequestration in soils and plants on your farm if you would get a financial support for this from other chain partners (not from subsidies)?</b>															
	<i>Answers</i>		383		148		24		38		24		27		122
<b>Yes</b>		85	326	80	119	92	22	79	30	79	19	89	25	91	111
<b>No</b>		15	58	20	29	8	2	21	8	21	5	11	3	9	11
	<i>All</i>		384		148		24		38		24		28		122
<b>Questions for Chain-Partners (9-10a)</b>															
<b>9 Do you know techniques farmers can use to increase the carbon in their soils?</b>															
	<i>Answers</i>		118		29		13		7		15		8		46
<b>Yes</b>		57	67	7	2	77	10	71	5	53	8	63	5	80	37
<b>No</b>		43	51	93	27	23	3	29	2	47	7	38	3	20	9
	<i>All</i>		118		29		13		7		15		8		46
<b>10 There are several examples for carbon offset programs and projects worldwide where people transfer money to fight climate change or to compensate emissions,. Do you think that the effort of farmers in binding and protecting carbon in soils and plants can be valorised in merchandising agricultural or other products?</b>															
	<i>Answers</i>		107		24		12		7		15		8		41
<b>Yes</b>		47	50	0	0	58	7	71	5	60	9	50	4	61	25
<b>No</b>		53	57	100	24	42	5	29	2	40	6	50	4	39	16
	<i>All</i>		107		24		12		7		15		8		41
<b>Final Questions for all</b>															
<b>11 Would you (your firm, company, institution) be interested to publish the efforts that you (your firm, company, institution) take to reduce climate impacts in your own production or by running compensation projects.</b>															
	<i>Answers</i>		459		153		34		45		38		32		157
<b>Yes</b>		64	295	63	97	82	28	56	25	82	31	41	13	64	101
<b>No</b>		36	164	37	56	18	6	44	20	18	7	59	19	36	56
	<i>All</i>		459		153		34		45		38		32		157
<b>12 To exchange and learn about suitable measures aiming to increase carbon binding in farm soils (carbon farming) and to develop business cases for these measures to valorise carbon farming in merchandising: Would you be interested to participate in our network working at these questions?</b>															
	<i>Answers</i>		460		153		31		47		39		33		157
<b>Yes</b>		64	293	64	98	52	16	49	23	79	31	48	16	69	109
<b>No</b>		36	167	36	55	48	15	51	24	21	8	52	17	31	48
	<i>All</i>		460		153		31		47		39		33		157

**Supplement 3** - The awareness of carbon farming in the agricultural sector, possible and used techniques and business approaches in the North Sea region. Short report of two surveys (2019 and 2021): **Carbon Farming Survey 2019 – Results of open questions by institution**. NSR Interreg Project Carbon Farming.

*Entries were translated by the project partners of the regions, some original passages were tolerated, single entries of the respondents are semicolon separated. They appear in the order of entry in the database.*

*Abbreviations for institutions: NLR – Norsk Landbruksrådgiving, Norway; Thuenen/3N – Thünen-Institute of Organic Farming and 3N Kompetenzzentrum, Germany; Inagro – Inagro, Belgium; Bionext – Stichting Bionext, The Netherlands; ZLTO – Southern Agriculture and Horticulture Organization, The Netherlands; Innov – Innovatiesteunpunt, Belgium*

**5 Have you considered to use techniques to increase or protect the carbon level in your soils;**

**5a If yes, please indicate the reason below (you can choose multiple options);**

**Other comment::**

**NLR;**

nutrient holding capacity, soil temperature;

mulching;

enhancement of the image of farmers;

**Thuenen/3N;**

mulching;

enhancement of the image of farmers

**Inagro;**

bigger yield;

soil life;

cover crops;

cover crops;

**Bionext;**

Because we treat the manure in the shed, the emission of NH<sub>3</sub> is way lower, therefore also a better climate in the shed;

To use less artificial fertilizer;

Circulair farm important to me, creating less waste and reusing more;

**ZLTO;**

practical reasons no tillage is less work;

increase organic matter;

improved load capacity, reduced energy consumption, better harvest planning;

increase yields, reduce drought and flooding risk;

increase organic matter;

**Innov;**

second cultivation, more feed, less nitrate loss;cheaper;

uses compost first in the stable to enrich;investment in the future for the people of tomorrow;

stimulate good soil life;

being a good leaser;

increase humus

**5b Please give a ranking of the importance of the reasons for you (e.g. C, D, F );;**

**NLR;**

A, D, F, G;

D, G, F;

D, F, G;

A;  
F, D, A, B, C;  
A, F, G;  
DGAF;  
A, B, F, G, C, D;  
A, C, D, F, B, G, E.;  
A, F, D, G, C;  
D, G, F, B, A.;  
D;  
F, G, A, C, B, D, E;  
D, A, F;  
D, G, B;  
F, D, C, G;  
D, F, B;  
F, D, B, A, E, C;  
A, D, F, E, B, C, G;  
F, D, A, G, B;  
D, A, E, F;  
A, F, D, C, E, G;  
D, A, F;  
A;  
F, D, B, C;  
C, F, G;  
A, F, C;  
A, F, D;  
D, F, B;  
C, F, D, B, A, E, G;  
F, D, E;  
C, A, D, B, F, G;  
G, F, D;  
G, F, A;  
A, F, C, D;  
G, A, D, F;  
D, G, F, A, B, E;  
G, F, D, B;  
D, G;  
C, B, F;  
C, F, A;  
G, F, C, B;  
G, F;  
G;  
D, B, A;  
A, F, D, B, C, G;  
A, F;  
F, D, A;  
F, G, D, E, C;  
D, C, F, A, B, E, G;  
F, A, G;  
F, C, D;  
G, F, A, D, C, B;  
D, B, F, A, G;  
D, G, F, A;  
A, F;  
A, D, F, E, G, B, C;

D, F, A;  
C, A, F, B, D, E;  
A, C, F;  
B, D, F;  
G, F, A, B;  
G, F, B, A, C, D;  
A, C, D;  
B, D, G, F;  
G, C;  
F, G, D;  
F, D, A, B, C, G;  
D, G;  
F, G, E, B, A, C;  
D, F, A, B;  
C, F, G;  
D, F, C, G;  
G, A;  
F, B, A, C;  
F, B, C, A;  
D, C, F;  
D, F, G;  
D, A, C;

**Thuenen/3N;**

a,b,c,d,f,e,h;  
b,d,f,h;  
c,d,f;  
b,f,d;  
b,d,a,f;  
a,f,d,b,e;  
d,f,b,a;  
d,a,g;  
b,f,a;  
g;  
f,d,g;  
d,a,b,c,e,f;  
d,a,f,e;  
all is necessary;  
a,b,d,f;  
d,e,f;  
a includes many points "  
d,b,a;  
d,f,a,b,c;  
a,f,c,d;  
d,f,a;  
d,a,c,f;  
d,f,g,c,a;  
g;  
c,f;  
**Inagro;**  
DFABCE;  
FADB;  
F;  
F;  
h;

D;  
B;  
F;  
D F B A E G C;  
FDB;  
BDEF;  
DABF;  
BDEFA;  
A B C D E F G;  
D A C F E G;  
D F C B A G;  
D F B C A;  
D F A E ;  
B D;  
D;  
F;  
D;  
C D F;  
H F C;  
D C B F;  
D F B A C;  
F;  
D B A F;  
A C D B F;  
D F B;  
F D B A ;  
A D B F G;  
A D B E ;  
**Bionext;**  
F, B, G;  
A, C, D, F, E, B;  
D, F, B, A, E, G;  
G, A, B, D, F, C;  
F, A, B, G;  
D, B, A, F, G, E;  
D, F, A, G;  
B, G;  
D;  
D, B;  
D, F, B;  
E, D, F, A, B, C, G;  
D, B, A, G;  
G, D, B, F;  
Is all connected, CO2 nice side effect;  
D, B, F;  
D, B, F;  
D, G, win/win;  
**ZLTO;**  
f, d;  
f, b;  
a, f;  
f, h, b;  
f;  
a, d, f, e, g;

d,a,e,g;  
b,d,f,a,e,g;  
f,b,a,d;  
f,a,d,b,e,g;  
a,d,b,e,f,g;  
a,d,f,e,b,c,g;  
f,e,a,d,b,g,c;  
d,a,f,e,b,c,g,h;  
d,f,b,a,e,g,h,c;  
f,b,d,a,eg,c,h;  
f,a,h,d,e,b,g,c;  
d,b,a,f,e,g,h,c;  
f,d,b,a,g,e,c,h;  
d,f,a,b,e,c,g,h;  
f,d,a,b,e,c,g,h;  
a,d,b,f,g,e,h;  
d,a,f,b,e,c,g,h;  
a,b,d,c,e,f,g,h;  
e,a,f,b,d,c,g,h;  
d,h,f,a,b,e,g;

**Innov;**

f,b,a,e,d,c,g,h;  
a,b,d,f,e,c,g,h;  
c,b,d,f,a,e,g,h;  
d,b,c,f,a,e,g,h;  
d,b,e,f,a,c,g,h;  
f,d,c,b,a,g,e,h;  
a,d,b,f,c,e,g,h;  
a,b,c,d,e,f,g,h;  
b,f,c,d,g,a,e,h;  
d,f,b,a,e,g,c,h;  
b,d,f,a,c,e,g,h;  
h,d,f,b,a,g,e,c;  
d,f,c,a,b,g,e,h;  
a,d,f,b,g,e,c,h;  
f,d,b,g,a,e,c,h;  
d,b,a,f,g,e,c,h;  
f,c,d,b,a,e,g,h;  
d,f,b,a,g,e,c,h;  
a,d,f,b,e,c,g,h;  
d,a,c,b,f,e,g,h;  
b,a,d,f,c,e,g,h;  
d,b,c,a,g,e,f,h;  
a,b,d,f,g,c,e,h;  
d,f,a,b,c,e,g,h;  
d,f,b,a,c,e,g,h;  
f,d,b,a,g,e,c,h;  
d,b,f,a,c,e,g,h;  
d,b,a,c,e,f,h,g;  
d,a,b,f,e,c,h,g;  
a,d,b,f,g,e,h,c;  
a,f,d,b,g,e,c,h;  
b,a,d,f,g,e,c,h;  
d,b,f,a,c,e,g,h;

c,a,g,b,e,f,d,h;  
a,b,f,g,e,d,c,h;  
a,b,d,e,f,g,c,h;  
d,f,a,b,g,c,e,h;  
a,b,d,f,e,h,g,c;  
d,a,f,g,b,e,c,h;  
d,b,a,f,e,h,g,c;  
f,d,a,b,e,c,g,h;  
b,d,a,f,e,c,g,h;  
a,c,b,d,f,g,e,h;  
a,d,f,e,b,g,c,h;  
d,f,b,a,e,c,g,h;  
d,e,b,a,f,c,g,h;  
b,c,a,g,e,f,d,h;  
d,f,b,a,e,g,c,h;  
d,a,f,g,b,c,e,h;  
d,a,f,b,g,c,e,h;  
f,d,b,c,a,e,g,h;  
b,c,g,a,e,h,d,f;  
f,g,a,d,c,e,b,h;  
b,a,d,e,f,g,c,h;  
c,b,e,f,g,h,a,d;  
b,a,c,d,e,f,g,h;  
h,c,g,f,a,b,e,d;  
f,d,b,a,g,e,c,h;  
d,a,b,f,g,e,c,h;  
d,b,h,a,e,f,g,c;  
d,a,e,f,b,g,c,h;  
d,f,b,a,e,c,g,h;  
f,a,b,d,e,g,c,h;  
a,b,f,e,d,c,g,h;  
f,d,b,c,a,e,g,h;  
a,b,d,e,c,f,g,h;  
b,c,g,e,a,d,f,h;  
d,a,b,e,f,g,c,h;  
d,b,f,g,a,e,c,h;  
f,d,b,a,e,c,g,h;  
d,f,c,b,a,e,g,h;  
d,b,f,a,c,e,g,h;  
a,g,b,c,d,e,f,h;  
f,d,b,c,a,e,g,h;  
f,d,b,a,e,g,c,h;  
d,b,f,a,e,g,c,h;  
d,b,c,f,a,h,e,g;  
f,d,b,a,c,e,g,h;  
f,d,b,a,c,g,e,h;  
f,a,e,d,c,b,g,h;  
d,f,g,a,c,b,e,h;  
d,f,b,g,a,c,e,h;  
f,d,b,c,a,e,g,h;  
f,d,a,b,c,e,g,h;  
d,f,a,b,g,c,e,h;  
d,a,b,f,e,g,c,h;  
a,d,f,b,e,g,c,h;



f,b,d,a,e,g,c,h;  
b,d,a,f,e,c,g,h;  
f,a,d,b,e,g,c,h;  
a,f,b,d,c,e,g,h;  
f,d,b,e,g,a,c,h;  
h,a,g,b,c,f,e,d;  
a,b,d,f,h,e,c,g;  
f,b,a,d,c,e,g,h;  
e,d,f,b,a,c,g,h;  
d,f,b,e,a,h,c,g;  
d,f,b,a,c,e,g,h;  
d,a,b,c,e,f,g,h;  
d,f,h,a,b,e,c,g;  
d,b,a,f,e,c,g,h;  
b,c,d,a,f,e,g,h;  
a,d,f,e,b,c,g,h;  
b,d,a,g,f,e,c,h;  
a,b,c,d,e,f,g,h;  
d,f,b,e,a,c,g,h;  
d,a,b,f,e,g,c,h;  
h,g,e,c,b,f,a,d;  
a,b,c,d,e,f,g,h;  
d,f,b,a,c,g,e,h;  
f,b,d,a,c,e,g,h;  
b,d,a,e,c,f,g,h;  
h,e,g,b,a,f,d,c;  
h,g,e,d,b,c,a,f;  
d,f,a,b,e,c,g,h;  
f,b,d,e,c,g,a,h;  
c,h,g,e,a,b,d,f;  
h,d,a,f,e,b,c,g;  
a,d,f,g,b,c,e,h;  
d,f,b,e,a,c,g,h;  
b,a,c,d,e,f,g,h;

**6 If you use techniques to increase the carbon level in your soils, which techniques do you use? (you can choose multiple options);**

**If yes, please specify how::**

**NLR;**

cereals, peas;

potatoes each third year and cereals.;

cereals, grass-seeds, hay-meadow, oilcrops;

if possible rotate with cereals;

various cereals and grasses;

change between cereals - rapeseed - beans;

Vegetables, potatoes, cereals, strawberry, green manure, cover crops, new this year lupins to increase the top soil layer;

cereals og green manure;

Grain, grass, try legume and oil crop occasionally + cover crop also sown after harvesting grain;

cereals and green manure;

undersown in cereals, cover crops, grasses in cereal rotations;

wheat, oats, potatoe, oil crops;

Oil crop/beans - wheat - barley-oats-wheat.oats-wheat;

3xcereals - 3xgrasses;

Have 200 daa meadow and 600 grain. Move the meadow around + some covercrop in the grain veins;  
cereals - peas- faba beans - cover crops;  
wheat - rapeseed - beans - grasses -strawberry flower grasses;  
grasses - green manure;  
grasses, redclover;  
Rape/turnip rape every 7 year- Wheat and oats in the middle of the rotation;  
cereals, grasses, oilcrops;  
cereals, grasses, rapeseed;  
cereals, oilcrops, grasses;  
vegetables, cereals;  
cereals, grasses;  
3 year crop rotation;  
"Keeps a grasscover as much as possible and have an open field only during ""underseed"" year";  
potatoes, green forage, grasses;  
crop rotation with grasses;  
F,D;  
cereals/grasses;  
green-manure, peas, cereals;  
cereals og oilcrops;  
cereals-potatoe;  
if practically feasible ;  
variation of different cereal crops;  
barley-oats-oilcrops-wheat;  
cereals-red clover-green manure- cereals ;  
oats-barley-wheat;  
5 years grasses-crop rotation with cereals;  
different cereal varieties;  
I have tried forage-rape and barley as green manure and sowing grass for 3 years;  
grasses 3-4 years, green-forgae, cereals with undersown grasses, forage crops with undersown crops;  
2 years cereals with cover crops - 1 year grass for grazing sows;  
area is used for grain - meadow 3-4 yeards - pasture ;  
peas - cereals - green manure crops;  
Area previously with grain is now meadow (last 4 years) as a soil imporvement measure;  
cereals and faba-beans;  
grasses cereals ;  
red clover, grasses;  
Adds compost and gradually biochar when re-organization of meadow. Use diffrent areas for vegetable and one area for berries;  
cereals, grasses;  
Pumpkin - garlic - seed mixture;  
green manure - seedmixture - grain;  
start with cover-crops this year;  
orchard fruits;  
Biodiversity as much as possible;  
Rotate between oats/barley/wheat - will try oil crop - faba bean;  
cereals, vegetables ;  
green forage - grasses;  
crop rotation cereals, grasses;  
Grass seeds, grain, legume;  
change/rotate between grain - green fodder and meadow;  
cereals, peas,raps;  
3 year meadow- 2 year grain;  
growing a little clover occasionally;  
cereals oilcrops rÇ÷dklverfrÇ÷grasses;

grasses, green forage with underseed;  
grass, rape forage, barley;  
cereals, grasses;  
grasses, cereals;  
always something that grows in the field grass/rape forage/grain clover;  
cereals, legumes, grasses;  
**Thuener/3N;**  
without plough, compost;  
faba bean with intercrop;  
cover crops, wide crop rotation, summer cereal;  
summer crop-winter crop alternation;  
barley, rape, maize, wheat (rye);  
introduce summer crops;  
from maize monocrop to cereal, grass and cover crops;  
rape, winter wheat, winter barley, bean, corn maize;  
rape in another crop rotation;  
left the intensive arable farm for five years and produce landscape, environment and insect protection through  
large-scale bloom mixtures;  
clover grass cultivation;  
changes in main crop, summer crops;  
nurse crop;  
cover crop;  
7 members-50% with summer crops;  
cultivation of cover crops;  
extension of crop rotation;  
less arable farming, more grassland;  
**Inagro;**  
grass+maize;  
rotation with cereals, cover crops and grass seed production;  
cover crops and cereals;  
every 4 year;  
crop rotation;  
selection of early cultivars of maize to have time to sow grass afterwards, early potatoes to have time to sow grass  
afterwards;  
3j -4 j;  
5 year;  
every 2-3 y manure and grass -maize-early potatoes;  
large crop rotation and use of manure;  
large crop rotation;  
maize-grass-wintercereals-luzerne;  
more use of grass;  
large crop rotation;  
use of grass;  
sowing grass+clover for 2 years and then 3 years vegetables;  
**Bionext;**  
Taking OM and soil fertility into account while making a cultivation plan;  
We're growing grassclover and winter rye;  
Growing grassclover;  
Grassclover;  
Logical order in rotation, 2 over 6 or 3 over 7;  
Grassclover 1 over 6 with sheep;  
**ZLTO;**  
2 of the 5 years: keep it green;  
grass seed cultivation;

more wheat and chopping straw;  
more grass seed;  
ample crop rotation and grass seed cultivation;  
limited because 50% corn;  
wider crop rotation and more mowing crops;  
**Innov;**  
Green manure;  
choosing for crops which leave organic matter behind;  
sow green cover mixes in time with great diversity and root intrusion at all depths;  
optimize crop rotation;  
grass in between and after crops;  
6 crops, alternating winter crops with summer crops, all crops are harvested themselves with combine harvesters in summer;  
after a couple years of maize, a couple years of grass;  
keep the soil covered year round;  
crop rotation;  
Corn - Corn - Potatoes - Winter wheat - Green cover;  
no monoculture;  
rotate between corn and grass;  
corn - grass - beets;  
corn cob meal instead of grain corn or silo corn;  
crop rotation;  
green cover;  
Corn - grass - beets;  
after-cultivation;  
"modern "9 stroke system"" with preservation / impact crop residues and if possible on 1 / 9th of the surface the application of green fertilizer";  
insert grass clover in the crop rotation, fewer plows;  
could be;  
stopped growing corn, now rotational cutting rye followed by clovers;  
aard. wt. groenbedekker. korrelmais wt groenbed. Aard;  
Green manure;  
crop rotation of 4 years;  
crop rotation 1 on 6;  
"rotation and crop rotation, leaving 1/4 of the fields ""at rest"" and sown with green covers / flowers. Every year we increase the humus content through compost and bokashi (which we produce ourselves from fermented green wastes);  
alternating mowing crops - grubbing crops;  
four crops with a system of three to three years;  
SEEDING STINKERS AS DISINFECTION + administering CARBON;  
cultivation plan with beets, corn, grass cutting rye, leguminous, deep-rooted grass;  
beet-grass-maize;  
crop rotation;  
Cultivation of grass seed, multi-annual cultivation;  
Breaking the monoculture of corn with 2 years of grass clover;  
main cultivation - green fertilizer cycle of 3 to 4 years;  
plenty of fruit and green manure;  
Corn straw underwork;  
avoid bare soils in the winter;  
after cereal grass to graze the cows in the fall then 1 spring cut immediately followed by corn and then for grain;  
corn grass corn corn grass corn ....;  
corn and potatoes;  
crop rotation and green manure;  
maize, grass;

Never try cutting corn two years apart;  
Fruit alternation, no monoculture if possible;  
many straw fields to put straw in the ground or to exchange manure for straw;  
cancel the cultivation of carrots and replace them with winter barley & industrial beans so that NKG becomes more applicable.;  
Sow green manure. Dorsmais. Growing a lot of grains and chopping straw;  
Grass corn potatoes fodder beet;  
Minsrens 4 different crops in 3 years;  
grass clover, cereals;  
Winter rapeseed, winter wheat, winter barley, maize or potatoes, harvested wheat and then restart;  
Try 1 in 5 with intensive crops, lots of cereals with green fertilizer;  
sowing green cover, seasonal lease to break through monoculture maize, several years of pasture on maize fields;  
wide rotation;  
Crops that apply a lot of OM;  
sufficient crop rotation;  
Rotate 3 fruits where possible;  
ample crop rotation and green covers;

#### **6 use of cover crops;;**

**If yes: please give which cover crops are used and the preceding crop ;**

#### **NLR;**

grasses;  
radish, vetch;  
white clover;  
clover, buckwheat, phacelia,...;  
grasses, clovers;  
Raygras, clover, chicorree, vetch, phacelia, radish and so on ;  
Diversity, clover-rich meadow and under crop, Pioneer mix sown after harvesting;  
Mix from Stand recommended by NLR;  
clover, grasses;  
grasses ;  
FK sourforage mix with 15% clover;  
Try to obtain diversity, the goal is 7 +;  
flowergrasses;  
first year last year - sown sour forage/pasture;  
grasses;  
grasses;  
cover crops;  
grasses, white clover;  
Not so relevant, but thinking of time for sowing and the danger of run-off.;  
green forage;  
grasses, rye, winter vetch;  
I am starting up, considering rye grass and white clover. Also other sorts with different properties;  
grasses og white clover;  
pionerblanding;  
white clover ;  
grasses;  
grasses;  
white clover and grasses;  
clover and grasses;  
Under planning;  
grasses;  
vetch, clover, phacelia, grasses, peas ;  
white clover;

orchard fruits;  
phacelia, grasses;  
grasses, clover;  
Timote grass, fescue grass, red clover;  
Have had a test with oil radish (raphanu sativus) + vetch, but will do rye grass in the spring ";  
vetch;  
grasses;  
clover, peas;  
grasses, white clover;  
**Thuenen/3N;**  
mixtures;  
available mixtures-winter wheat than maize/faba beans;  
"after winter wheat before maize;  
if possible always before maize";  
phacelia, guizotia after winter barley;  
green rye-cereal, mixed cover crop-cereal, agricultural grass-cereal;  
Landsberger-maize;  
viterra universal-maize;  
before summer crops;  
non hardy cover crops-winter cereal (KWS Ackerfit);  
Guizotia, buckwheat;  
Mixture from land trade-winter barley;  
"Mixtures with and without Legumes-maize and bean;  
grass nurse crops";  
cover crop mixtures - after maize and beet (no monocultures);  
wheat, phacelia+clover, maize ;  
green manure, mixture of cover crops;  
various winter greening;  
**Inagro;**  
cereals, peas + white mosterd and Japanese oat;  
white mosterd, gras;  
cutting rye;  
gras before maize;  
japanese oat and phacelie;  
gras;  
gras, white mosterd, japanese oat, phacelie;  
mosterd and japanese oat;  
mosterd afterd potatoes, oat after line, phacelie after cereals;  
cereals+phacelie+japanese oat, beans and mosterd+phacelie;  
gras;  
gras;  
italian gras, white mosterd, phacelia;  
potatoes and japanese oat, barley and white mosterd;  
gras, japanese oat, phacelie;  
japanese oat, white mosterd, radish, cutting rye;  
phacelie, gras;  
gras;  
winter barley-gras, other white mosterd;  
white mosterd;  
gras, cutting rye;  
gras-mosterd;  
phacelia;  
gras, mosterd, phacelie;  
gras before maize;

rdish, white mosterd, gras;

gras;

gras;

gras;

gras;

Gras;

japanese oat, gras, cutting rye;

Japanese oat;

gras;

japanese oat, phacelie, buckwheat;

japanese oat+vegetables;

**Bionext;**

Mustard plant and fodder radish ;

Grasclover, barley after parsnip;

Mixtures with 10 different species;

Oats after onions, cover crop after sugar maize;

Cover crop mixtures;

**ZLTO;**

mustard-grain;

facelia-grain, vetch-grain;

solarigol before potato, betamix before fine-seeding crops;

Mixture of yellow mustard and leaf rams - summer barely and winter wheat ;

mustard - grain or seed onion (depending on season);

musterd and leaf radisch or a mixture;

many of musterd low costs;

more cover crops. Grass, musterd and leaf radish. ;

Musterd;

mixtures ;

Leaf radish;

More mixtures;

Yellow mustard;

divers, potatos onions and red beets;

mixture,grain;

mixture. First leaf radish;

Mixture, winter wheat or winter barley;

grasses mixtures leaf radisch or japanese oats or yellow mustard;

yellow mustard after wheat English turnip grass after seed potatoes;

Corn potatoes roots green manure japanese oats and grass;

can blade, leaf radisch, yellow mustard and vetch;

potato, triticale other crops,grass;

grain with straw plowed under, leaf radish;

summerbarley and winter wheat, mixtures of yellow mustard;

**Innov**

grass or leaf radish after wheat;

flower mix;

Japanese oats after eg peas beans wheat lettuce broccoli even after maize maize;

grass after potatoes and coliflower;

grass maize;

Yellow mustard, leaf ranas, facelia, grass mixture after every crop: wheat,aardappelen, mais, bieten en bonen;

Japane haver na bv erwten bonen tarwe sla broccoli zelfs na mais mais ;

gele mosterd met bladrammenas, Japane Haver na tarwe, erwten of ma<s;

black radish and yellow mustard after corn;

grass after potatoes and after corn;

cutting rye or this year ryegrass after corn;

mixture of green covers;  
grass after maize and grains;  
grass / yellow mustard after winter wheat";  
always grass after maize;  
Grass after maize;  
Corn sliced ??rye or Japanese oats, wheat ryegrass";  
Grass or cutting rye, pre-washed: grain or corn;  
Cut rye, Japanese oats, mustard, after corn, ryegrass after wheat";  
grass after maize;  
Rapeseed and yellow mustard after winter wheat";  
mustard, Japanese oats after winter wheat and winter barley";  
Cereal ;  
mix of grass + sliced ??rye + winter turnips after potatoes, wheat, corn;  
grass after maize, potatoes of cereal;  
cutting rye;  
Yellow mustard. Rye-grass;  
Italian;  
corn and then green manure;  
maize - cutting rye;  
grass potatoes;  
grass after cereal maize;  
sow grass after potatoes;  
after corn leaf rams and Japanese oats";  
grass;  
Italian ryegrass / rye after beets and corn cultivation;  
Corn and then Italian ryegrass and last year with the drought mixture with yellow mustard;  
corn and ryegrass;  
recognized mixture after maize;  
rye after corn;  
After field beans and winter wheat sow mainly yellow mustard (exceptionally sometimes Italian ryegrass);  
Italian ryegrass after the corn;  
Grass after maize, and after fodder beetroot, and after triticale;  
cutting rye, grass, greencover;  
1st year phacelia + ""insect buffet"", 2nd year due to lack of space / time planning none, 3rd year is now better  
planned and will become Egyptian clover";  
yellow mustard and phacelia after winter barley and oats;  
phacelia after wheat, grass after grain maize, grass after potato;  
grass after corn, wheat after beet, grass mix after grain;  
phacelia;  
grass mix or mustard / phacelia after grains or early carrots;  
yellow mustard and grasses after wheat";  
Japanese oat salad;  
rye and italian after corn;  
grasses and oat;  
Yellow mustard after wheat;  
corn, rye;  
mustard and phacelia after wheat stubble / beans;  
Japanese oats, lupins, winter wheat, ... after herb cultivation;  
green manure;  
mustard, Japanese oat;  
grass after maize, grass after grain, beets after meadow, etc.;  
STINKERS;  
cut rye after corn;  
grass;



Rye grass after barley ;  
mustard after cereal;  
Cut rye after corn;  
Corn - cut rye - corn - 2x grass clover;  
mustard and varieties";  
Yellow mustard. Facelia. After winter wheat and winter barley;  
yellow mustard and mixed crops after cereals;  
Yellow mustard cereal;  
mainly yellow mustard after cereals, applying mixtures in the future;  
Yellow mustard phacelia. After winter wheat and winter barley;  
after maize grass;  
grass yellow mustard;  
Mix;  
Yellow mustard after cereal;  
grass after maize;  
grass or rye / corn or potatoes;  
Grass;  
Wheat & ryegrass. Wheat & yellow mustard;  
grass, japanese oat;  
Grasses after cereals yellow mustard after early potatoes cut rye after corn;  
Growing corn / Italian ryegrass or rye;  
oats and beats after wheat or barley for potatoes or maize (1 year in 5) impossible for wheat barley or rapeseed!;  
Japanese oats / Facelia after early potatoes and industrial beans and Japanese oats and Tagetes on set-aside tree nursery plots.;  
Yellow mustard, after winter cereals. Now consider Japanese oats for more ox addition;  
As before and after-growing grass, corn or tritecalle or fodder beet grows;  
After barley comes a mixture of mustard with leafy radish;  
grass + grain after corn;  
oat;  
Grass;  
Grass;  
Japanese oats, facelia, tagetes;  
Italian ryegrass after corn;  
grass, yellow mustard after every crop that is harvested early;  
Facelia, grass clover;  
grass after cereal;  
Japanse oat cereal;  
yellow mustard leaf rammanas;  
grass or yellow mustard after cereals vl after barley;  
Mixes of Japanese oats and facelia after winter barley;  
buckwheat, vetch, Japanese oats, Sudangrass, facelia, mustard, ... after cereals;

**6 import other organic material (sewage sludge, industrial organic wastes);**

if yes, which materials [Format: separate your entries by comma (text text, text, text, ..)];

**NLR;**

sewage sludge;

not material available;

sewage sludge.;

sewage sludge;

We try grounded hardwood branches on green manure meadow - harvest straw for surface area composting.;

sewage sludge;

wood chips;

Use deep litter on areas with bad soil structure;

chicken manure pellets;

Deep litter from cattle from another farm, bio char and some area composting;  
livestock manure;  
livestock manure;  
sewage sludge, biorest and chicken manure from another farm;  
sewage sludge;  
sewage sludge;  
organic wastes;  
sewage sludge;  
sewage sludge;  
sewage sludge;  
sewage sludge;  
chicken manure pellets;  
Did get sewage sludge once, but that also contained chicken millet. So that will not be done again;  
sewage sludge ;  
manure from fur farms;  
sewage sludge;  
sewage sludge ;  
sewage sludge ;  
wishes to import organic materials import of sewage sludge is not possible due to organic production guidelines  
;  
sludge over 10 years;  
sewage sludge;  
sewage sludge;  
chicken manure pellets;  
RØYE sludge ;  
Sludge on recent sown areas ;  
Straw deep litter. Partly converted;  
sewage sludge;  
Not as of today, am planning to use compost and livestock manure;  
Have planned sewage sludge 2020;  
Have put out ash from pulp chips combustion plant on the garlic production to see the effect in 2019;  
sludge;  
sewage sludge;  
sewage sludge;  
On.. Vegetables - straw and plant remains;  
straw and Pioneer seed mix;  
Hardwood chips;  
Organic residues from GREVE;  
manure;  
woodchips in kompost;  
sludge as much and as often as possible;  
sewage sludge;  
sewage sludge;  
**Thuener/3N;**  
biogas residues;  
sewage sludge since 1989;  
"leaves;  
woodchips";  
compost-fermentation substrate-sewage sludge;  
phytogram;  
**Inagro;**  
manure;  
manure;  
green compost;

leaves of chicorie, pot soil;  
manure;

**Bionext;**

solid manure (biodynamic and deep litter) and external green manure;

We use Bokashi, made from green waste from the municipality and our own solid manure;

Organic material nature areas;

Own compost and natural waste materials ditches and composting own shed manure, 20 tonnes composted shed manure and mowing material per ha;

Solid manure on pastures that were used by previous owner to grow a lot of maize to improve soil biology and structure, Try to inject manure as less as possible, better for soil biology ;

Composting goat shed manure and bokashi from mowing material;

Own manure, cattle manure with straw and also some liquid manure;

Own manure from litter shed with reed from nature area we manage;

Solid manure from goat farmer, liquid manure from pig farmer;

We use chicken manure that we partly compost and partly use as manure;

Organic waste as compost, goat manure and manure from our own cows, also some liquid manure, using straw and wheat;

Own goat manure with straw;

Green manure;

Own straw manure, get everything from my own land and nature areas in the area, waste from ditches as fertilizer;

once every 6 years 30 ton compost, organic liquid cow manure, organic chicken and goat solid manure;

Own solid manure;

We're composting ditch material;

We use compost if there is room regarding P left, solid manure from organic goat farmer in exchange for grassclover, chopping under of straw;

Solid chicken manure, champost;

**ZLTO;**

champost;

digestate from biogas plant;

champost and optimest;

chalk;

**Innov;**

Blood meal;

digest of biogas;

Brewery sludge;

Wood chips from pruning pollard willows and shrubs;

Slib van inbef Brewery sludge;

chopped prunings;

soak in the straw of the cereals;

foam from the sugar factory;

limited but organic fertilizer from COMPO;

sludges from gelatin processing;

champost;

Brewery sludge;

vegetable waste from the cutting kitchen of a processing plant in the area, which we let ferment (currently still in the start-up phase);

compost;

Thick fraction of digestate. Foamy earth;

Thick fraction of digestate. Foamy earth;

Ever done in the past (lime sludge from water softening);

gelatin lime;

**6 reduction in tillage;**

**if yes, how::**

**NLR;**

autumn and spring harrrowing;  
autumn harrowing when conditions allow.;  
direct seeding on some of the area;  
springtillage and direct seeding;  
spring tillage.;  
tillage 1-2 times then sowing;  
silofoil, wheel hoe +/- broadfork;  
no ploughing or tillage in autumn;  
ploughing seldom;  
no ploughing;  
harrowing and sowing - shall start surface composting;  
only harrowing before sowing;  
direct seeding or only 1 tillage for seeding;  
Hibernating in stubble with harrowing before sowing in the spring;  
goose feet harrowing etc instead of plowing when possible;  
ploughing seldom;  
some direct seeding;  
harrowing some and plowing some;  
ploughing with ecomat, only tillage for harrow;  
Stubble harrowing for autumn grain and in the spring on the clay;  
Vaderstad sowing machine;  
no ploughing;  
with cover crops the goal is to not till in a few years;  
only harrowing on some areas;  
partly - depending from weather;  
"Establish solid bed - use handheld tool in line with "market gardening";  
no ploughing or tillage;  
disc harrowing after rape - other than that after evaluation;  
take good care of the meadow so it can last very long;  
reduced tillage after oilcrops;  
reduce ploughing;  
Flatekompostering;  
minimize use of rotational tillage and ploughing use harrow;  
direct seeding;  
no ploughing;  
spring ploughing;  
Spade machine;  
I produce seed grain and I am therefore dependent on plowing in the autumn;  
tillage and direct seeding;  
Have a lot of stones, so it is a bad alternative to plow;  
ploughing only before potatoes;  
no ploughing;  
long lasting cultivation of grasses;  
To the extent suitable for that type of soil/grain on the same area year after year. Easy autumn harrowing,  
livestock manure and harrowing in the spring.;  
Stubble harrowing or superficial harrowing in the spring;  
minimize ploughing;  
no ploughing or tillage;  
direct seeding in stubbles;  
Established meadow, plan to sow directly alfalfa with among other things.;  
springtillage ;  
Renew the meadow without plowing;  
Continuous meadow due to difficult terrain;

Harrowing on one part;

no ploughing;

disk harrowing;

no till;

A lot of old meadow;

orchard fruits;

rototiller;

no ploughing;

depends on what I have time to do in the autumn;

tillage;

Parts of the area is harrowed and sown without plowing. No tillage during autumn;

Never plough, but tillage varies with plants, the nature for the soil etc etc etc;

No plow, harrow in the spring. Occasionally direct sowing;

only tillage;

if possible plant several plant at the same time ;

no ploughing;

tiller;

**Thuenen/3N;**

mulch up to 20 cm depth;

reduced ploughing;

more with cultivator, less with plough;

Strip-Till;

50% mulch seed;

carrycomb (striegel) completely without glyphosate is difficult;

after rape no plough with cover crops;

only if it is possible;

more grassland;

**Inagro;**

no plowing when sowing maize;

less soil live;

no plowing before sowing cereals;

erosion plow;

no plowing before sowing cover crop;

no plowing before sowing cereals;

erosion plow;

reduced tillage and use of light machinery;

no plowing;

erosion plow;

**Bionext;**

No-tillage;

No-tillage;

Quit tillage;

Reduced tillage, only with renewing grassland, not with maize or sunflower;

Less ploughing of grassland;

We don't plough grassland, are also not allowed;

Reduced tillage;

Only plow when there is not other option;

Plough as little as possible and as shallow as possible;

Don't plough grass;

Reduced tillage;

**ZLTO;**

no tillage;

no tillage;

no tillage before wheat and after potato;

tossing instead of plowing;  
because of better structure less intensive soil tillage;  
Not plowing before planting winter wheat;  
fewer stubble processing;  
no tillage;  
tossing and cultivating, grass seed under cover;  
sometimes no tillage;  
no tillage;  
**Innov;**  
No tillage if possible;  
non-reversing tillage;  
no reverse soil treatment and rather decompact soil with actisol;  
Never more than necessary, tarnishing of green cover without real tillage;  
sow wheat without plowing;  
plowless for growing corn.;  
direct sowing green fertilizer;  
not plowing in the fall, soon also try to plow less in the spring;  
little or no plowing";  
semis immediately interspersed with tcs, no use of deep tillage (max 4 cm deep);  
Subsoiler;  
Digging instead of plowing, minimal superficial processing for sowing green fertilizer;  
go deep vibroflex;  
as few possible tillage operations;  
tilling soil with deep ground: turbulence;  
do not weed everything for the winter, otherwise the plots are too wet in the spring since we have wet plots;  
deep subsoiler;  
do as few operations as possible;  
More grass;  
tossing;  
re-sow grass after milling (no plowing);  
Less classic plowing. Use of erosion plow and combination sowing techniques;  
no plowing;  
as few serious soil disrupting operations as possible => maximize harrows, minimize freezing, use spindle cutter  
but do not plow (unless initially when the field was torn in year zero);  
less plowing;  
some plots are just deep digging;  
less plowing;  
use of erosion plow for certain crops;  
leave grassland for longer;  
plowless / max 3 operations for sowing / planting;  
weeding a lot;  
not plow every year;  
part tossing instead of plowing;  
not turning, with smaragd or digging. no more plowing. looking for mulch sowing for corn;  
not plowing for some crops;  
no turning ground;  
Sow corn directly without post-processing after plowing;  
without plowing for beet cultivation;  
less plowing;  
do not plow or shallow plow if necessary;  
simply sow grass after grains;  
fewer plows, direct sowing without rotor harrow;  
Deep soils;  
digging or just rotary harrow;

less plowing;

Deep soils;

Sow grass and grain without plowing;

Shallower plowing and where is possible without plowing;

not plowing but not plowing has a negative effect on carbon in the long term (less carbon in 30 cm bottom and more in 10 cm top layer) therefore does not work on total carbon storage in the ground!;

Plowing replaced by a spindle cutter at tree nursery and NKG by means of Actisol and rotor harrow in arable farming;

no plowing. To keep organic matter in the top layer";

As much as possible to work shiftlessly, I usually edit the top 4 CM with disc harrow and then sow;

Deep devouring not turning;

no turning ground;

no turning ground;

erosion plowing;

no turning ground before maize;

no plowing before cereals and maize;

No-Tillage and no turning ground;

**6 stimulation of soil biology;**

**if yes, how::**

**NLR;**

incorporation of straw;

harvest straw seldom;

compost, cover crops;

recycling of bio-residues;

reduced tillage, plant cover whole year;

fallow one after the other field and sow pioneer mix;

only reduced tillage;

compost, stinging nettle manure, biocoal;

Do not remove straw- spread livestock manure on as much area as possible - reduced tillage;

organic farm with cover crops - green manure - deep litter from cattle - reduced tillage;

By all the measure mentioned above the most important is biodiversity to increase soil life, and not plow to not destroy the organisms;

crop rotation;

See above, it is all connected;

drainage, lime, chicken manure;

autumnploughing only for winter wheat;

livestock manure, cover crops;

Try to avoid soil compaction;

manure;

Diversity - use the plants that grow;

drive periodically with ground sole loosener;

Organic residues;

straw recycling;

lactid acid ferment in the livestock manure;

reduce soil tillage and give plant residues back to soil;

Grazing or frequent mowing/mulching;

Talle from own farm,mest mulig omdannet.;

organic farming, crop rotation, livestock manure, compost.;

cover crops, kompost, livestock manure;

Drive as little as possibe, leave straw in the field. Try with cover crop and or crop rotation.;

livestock manure;

Hose spreading, little as possible compaction;

green manure;

input of organic matter;

crop rotation, clover, allid grÇ÷nn Ç¼ker autumn ;  
no ploughing;  
reduce tillage to a minimum ;  
Tillage under best conditions, twin wheel;  
rye grasses, composted manure to prepare soils ;  
organic materials ;  
Drainage, try to avoid soil compaction, crop rotating with rape, cover crop and cover crop;  
cover crops, grÇ÷nngjÇ÷dsling;  
try targeted grazing;  
no tillage for sowing;  
Do not use pesticides. Established last year a small test area with vegetables/herbs where we use pelletized  
chicken manure. Will continue this year;  
chisel plough in 2018 ;  
reduce use of pesticides to a minimum;  
large crops, correct fertilization, livestock manure;  
livestock manure;  
crop rotation ;  
Add compost and use meadow on the areas with most sand;  
long lasting cultivation of grasses;  
measures mentioned above;  
light tractor and do not drive on damp soil. ;  
light equipment, no pesticides;  
cover with grass;  
Minimize driving damage, pasture;  
livestock manure;  
no ploughing, compost, livestock manure;  
avoid soil compaction - soil tillage at appropriate time;  
livestock manure;  
avoid soil compaction;  
Biovin (biological soil improvement);  
organic;  
each halm given back to the soil helps to increase biological activity;  
no use of fungicides and insecticides;  
minimal use of pesticides, ploughing minimal;  
**Thuenen/3N;**  
earthworms;  
work with horse manure;  
cover crops, liming;  
"without ploughing;  
Compost;  
nurse crop";  
"winter greenings;  
mulch- work with disk harrow in spring for the first time";  
cover crops;  
winter greening;  
solid manure instead of liquid manure;  
**Inagro;**  
good structure by soil decompaction, good cover crop;  
optimal pH and soil carbon content;  
loss plowing, less deep soil cultivation;  
cover crops;  
manure, ph optimal;  
manure;  
use of soil improving products (PRP);



organic manure;  
sowing without plowing;  
manure;  
manure;  
manure;  
less plowing;  
using soil improving products (PRP);  
compost;  
**Bionext;**  
Adding bacteria;  
The bokashi and solid manure is feed for soil fauna;  
Liquid fertilizer to stimulate soil fauna and roots;  
**ZLTO;**  
Apply compost, organic manure and cover crops;  
Apply cover crop mixtures;  
no tillage;  
cover crop;  
cover crops and grass seed;  
wide crop rotation;  
apply Biovin and Fulvine;  
compost, cover crops;  
**Innov;**  
organic;  
sow flower mixtures and plow in the spring";  
compost, stal manure;  
PRP (Neosol) sprinkle in the fall;  
promote qualitative farm compost, compost tea and surface composting using green cover plants;  
Stal manure beef;  
stal manure;  
less tillage and sowing as much grass as possible;  
disturb the ground as little as possible;  
Apply organic fertilizer;  
Use manure, do not compact soil (low pressure tires);  
prp - sol;  
straw is chopped;  
Special fertilizers that stimulate soil life;  
more soil life due to more humus";  
crop rotation;  
work on solid ground, pull loose to breathe.;  
soak in straw of grain;  
by digging deep, you break the hardened soil layers and bring oxygen into the ground;  
use a lot of solid manure;  
optimum water balance, ph and cool dust;  
airy soil, manure;  
digging compost;  
Plot surface area or slightly sloping to canal + ensure good drainage;  
not yet, but the goal is to look into the possibilities with bokashi and / or EM (effective microorganisms) in the future;  
administering compost, working in straw, grass clover in cultivation plan, green manure;  
chop up straw and act to increase earthworms;  
break the monoculture;  
stal manure;  
Taking care of our soil by not working with heavy machinery in conditions that are too wet";  
deep soils every three years;

I feed carbon (impact) to dairy cows;  
erosive tillage/no turning tillage;  
by enclosures of bio compost and bokashi (with efficient micro-organisms as a starter);  
apply organic matter;  
ventilate grounds;  
PT MIX, VIVISOL;  
prp;  
solid manure + green manure;  
good dewatering;  
Keep soil airy, do not compact. Wide tires at low pressure;  
green manure;  
stable manure and green manure;  
green manure and organic manure ;  
Do not work too deeply;  
application of compost increases soil life;  
stall manure and green manure;  
feed soil life with certain fertilizers, so as to better soil and better plants;  
organic manure;  
effect crop residues;  
stable manure;  
compost;  
Use stable manure and limited tillage oh optimally keep good water management;  
Farm manure / slurry / no monoculture;  
to have as much humus as possible;  
Farm manure on meadows, but is almost impossible due to Flemish manure law that is the only one in Europe  
against farm manure use.;  
When fertilizing, opt for organic fertilizer as much as possible.;  
This year I thought to use a bascillus.;  
Leave the plots covered as far as possible with a crop;  
Soak up green fertilizer.;  
stable manure, grassland, little or no fertilizer;  
All the above, compost, solid manure, green fertilizer, no turning tillage;  
Ever sprinkled seaweed lime instead of. regular lime;  
deep soils;  
Ensure that the soil always stays green;  
stal manure;  
Application of OM with stable manure;  
prp sol;  
penac;  
dairy cattle is housed in a stable. So a lot of stable manure.;  
No-Till;  
**6 other techniques to increase carbon in soil;**  
**NLR;**  
straw;  
wood chips and biochar;  
self made biochar in small quantities - should be common merchandise;  
return straw to the soil;  
harvest residues oan dlivestock manure ;  
green manure;  
organic cover of soil for some cultures/sorts of plants;  
Wood/pulp chip and remains form chopping wood;  
straw incorporation;  
incorporating straw;  
mix a lot of wood chip in the deep litter, grazing on larger areas;

try to have prolonged circulation with meadow- plow down a lot of livestock manure when underseed/seeding year and graze after-growth in the autumn;

crop rotation;

biocoal and ashes from biowast burning ;

compost with woodchips ;

**Thuenen/3N;**

nurse crop in rape and bean;

"soil tillage in march, april- august under the trees;

between them grazing seed, that will be mulched regulary";

orchards in permanent grasslands;

**Inagro;**

wood bark;

less deep plowing;

no tillage between two crops;

grain corn;

chicken manure, winter cereals;

wood chopping;

winter cereals;

winter wheat, chicken manure;

pruning waste of roses;

compost (wood snips);

**Bionext;**

No ploughing of lasting grassland;

Using deep rooting crops like clover, lucern and sunflower and grass mixtures with clovers and herbs;

Willows around pastures;

Chopping of straw;

Light weight machinery;

**ZLTO;**

straw chopping;

straw chopping;

straw chopping;

apply zeoliet;

**Innov;**

reduce compaction due to low tire pressure and own equipment that is less large than contractors, and only drive on well-bearing soils;

affect as little soil structure as possible, bare soil as little as possible.;

although I do keep my eyes / ears open and I am open to experiments;

non-reversible soil tillage, working shallower, limiting tillage intensity;

straw or ground wood chips;

kalk;

use straw bedding in the boxes;

residual crops such as straw etc. always remain on the plot;

fixed bed cultivation with fixed driving tracks;

dry cows / calves on chopping wood in freewheel stable;

Limping, manure;

use of farmyard manure from own cows;

ample crop rotation of vegetables and potatoes (not reserved for young farmers);

Indirectly by maintaining the bottom pH;

shredding and composting your own industrial waste (tree nursery).;

Fertilization exclusively on farmland on all arable land (purchase for more than EUR 10 000 in straw per year);

Correct time of editing! Tire pressure, ?;

Controlled trafic farming;

**7 Which techniques would be of interest to you to increase the carbon level in your soils?;**

## **7 adapt crop rotation;**

**if yes, how::**

**NLR;**

crops-grasses;

cover crops;

undersown crops;

depends on available area ;

cover crops og underseeds;

not sure about;

multiannual grasses, grasses;

vegetables;

cover crops;

include a meadow in rotation;

rapeseed-beans;

more oilcrops;

Meadow, green manure and cover crop;

More covercrop with several properties - for instance with the ability for losen soil compaction;

grasses;

not sure;

undersown cultures are interesting - would also like to try other main cultures;

cereals, grasses;

grasses;

I would need more information;

no idea;

more crops;

cover crops;

include grasses in crop rotation;

winter hard green manure in vegetables;

try as much as possible within what is practically possible. ;

grasses;

grasses;

of interest in cereal areas;

We must accept that if we are to have agriculture in the whole of Norway - grass production must be reserved for the grass areas in the West and North of Norway;

grasses, cover crops, undersown crops;

not sure;

grasses;

vegetables in the rotation scheme;

I would like to test other cover crops I can use ;

forage rape;

no idea;

beans - peas;

cereals - radish/rapeseed, cover crops. ;

would need help;

undersowner;

grasses;

include grasses, vegetables, potatoes;

cover crops, undersowner;

cover crops;

cover crops;

cover crops;

in production of vegetables not in grass production;

cover crops and undersown crops;

cover crops;

I am looking for other methods of doing crop rotation;  
cereals med cover crops;  
grasses;  
cover cropset, undersowner;  
Ç?nsker Ç¼ satse pÇ¼ vÇ¼rsÇ¼dde cover crops framover. ;  
cover crops;  
saw cereals dircet in grasses;  
cover crops, grasses;  
I would like to start with direct seeding;  
cereals/grasses;  
I am just adapting the crop rotaton ;  
cereals/grasses/bÇ¼nner/peas;  
more frequent crop rotation between field/meadow;

**Thuenen/3N;**

cover crops, spring crops, leaving straw;  
cover crops, spring crops ;  
wide crop rotation;  
summer cereal";  
agrikutural grass, green rye;  
it would be nice to find out;  
summer crops to allow the cultivation of cover crops;  
change;  
permanent grasslands;

**Inagro;**

grain corn;  
maize/gras->crop rotation;  
I already do;  
see question before;  
more gras;  
winter wheats before potatoes;  
putting gras into arable land only for 8 years (in stead of 5 years);  
gras under water;  
soy;  
Gras;  
keeping the erea of gras;  
cattle production;  
more cereals;

**Bionext;**

Growing more wheat and grain, now only for cows, would be nice also for human consumption, then we could plow the straw, but the benefits are too low now;  
I'm curious for the different effects of different feeding crops on soil OM;

**ZLTO;**

Keep the soil green throughout the year;  
if it fits and i f I am convinced that it works;  
grass seed because it stays green the entire year;  
plow under straw and grain corn;  
see earlier answer;

**Innov;**

switch with grass land;  
not possible for fruit;  
sow green covers and mixtures in time;  
less maize;  
if i can improve, i will;  
protein crop;

with the best available resources;  
Corn fast spring rye;  
Still to be seen;  
more wheat and then shred straw;  
see previous;  
more grass;  
the one that is currently being used is sufficient to increase C storage;  
growing cereals every 2 years;  
as little bare soil as possible;  
Use a good crop rotation already, but might be even better;  
alternate with potatoes;  
optimizing what I am already doing, including finding the right green fertilizer in relation to the available surface area, cultivation time and purpose (CO2 storage, water storage, ...);  
more grass clover;  
grow crop in rotation that brings more humus into the soil;  
grow as many different crops as possible for my cows;  
no idea how;  
switch;  
see earlier;  
meer humus in de grond trachten te krijgen door groenbemester;  
met duidelijke begeleiding zoeken naar gewassen die de symbiose in de bodem pos beïnvloeden ;  
Graszaad telen;  
Grasland niet scheuren, extra teelt. ;  
andere teelten / andere groenbemester mits verdere mechanisering;  
meer graan, gevolgd door aangepaste groenbemesters;  
meer gras klaver;  
Teelt vlinderbloemigen;  
Dorsen van mais;  
Zie vorige vragen. ;  
Gras mais gras of Snijrogge mais;  
Misschien in de toekomst overwegen om voederbieten, sorghum, luzerne in het teeltplan te plaatsen;  
gras / granen als teelt;  
zoals eerder vermeld;  
**7 use of cover crops;**  
**If yes, which::**  
**NLR;**  
cover crops, catch crops around potato fields;  
cover crops in autumn;  
undersown;  
most after harvest- have thought to try to sow in standing grain;  
grasses;  
I am open for all;  
all types of cover crops;  
cover crops after harvest;  
have cover crop - can change seedmixtures;  
cover crops s<sup>c</sup>dd f<sup>c</sup>r tresking;  
cover crops etter autumnning. ;  
white clover;  
no idea;  
clover vetch;  
no idea;  
undersown;  
undersown;  
open for more information;

not sure;  
undersown crops, cover crops;  
clover, grasses;  
grasses;  
I would need more information;  
undersown;  
no idea ;  
underseeds;  
cover crops;  
Sow grass mix after vegetables and cereals;  
cover crops etter hovedkultur;  
grasses;  
forage radish;  
grasses, rye og vetchr sC¾dd i eller etter vegetables ;  
underseeds, rye grass, whiteclover. But also other species. Good solutions and tests must be developed for plants  
that fits our climate and growth zone;  
intercropping;  
I have no knowledge;  
I need more knowledge on how cover crops can be combined with seed grain production;  
white clover /pionerblanding;  
rye grass, plants with deep root system that does not disturb seed production of clover;  
cover crops som vokser etter autumning;  
nor sure;  
cover crops;  
undersown;  
no idea;  
alltid undersown or underseeds with main culture;  
I want to try something to loosen the soil;  
grasses for grazing in autumn after cereals;  
fodder radish, vetch;  
clover grasses + ???;  
undersown, grow cultures in autumn;  
would need help;  
in the long run, but not with the lack of knowledge as of today;  
grasses;  
not sure;  
peas, clover, upin;  
as recommended for the area;  
cover crops som vokser etter autumning;  
K;  
no idea;  
cover crops etter autumning;  
cover crops som vokser etter autumning;  
establishing grasses in cereals or other main crops;  
undersown og cover crops. ;  
nitrogen fixing crops;  
no idea;  
no idea;  
all types of cover crops that are possible in nordisc climate;  
oil radish;  
grasses;  
undersown, evt. etter autumning;  
grasses;  
grasses, clover etc. ;

undersown;  
grass undersown in barley;  
all suitable cover crops;  
N-fixation by legumes;  
Already ;  
growing grasses in autumn;  
clover;  
diversity in crops, as much as possible;  
**Thuener/3N;**  
diverse, e.g. green rye;  
Phacelia, guizotia;  
DSV products;  
no idea;  
without cruciferous;  
not yet decided;  
the mixtures;  
the mixtures - 40% with legumes;  
phacelia, clover;  
**Inagro;**  
white mosterd, japanese oat after cereals, peas;  
white mosterd, gras;  
phacelie;  
gras;  
gras;  
Japanese oat;  
see 5b;  
white mosterd, japanese oat;  
Gras;  
gras;  
after beets winter barley, scorzonera for wind erosion;  
gras instead of Mosterd;  
phacelie;  
see 6;  
gras;  
after winter cereals and aerly potatoes;  
cover crops in spring;  
**Bionext;**  
-;  
**ZLTO;**  
Use of more cover crops time is often limited;  
mixtures vetch phaccilia and clover ;  
Use of more cover crops time is often limited;  
use of more mixtures;  
more mixtures;  
more mixtures;  
we need more knowledge;  
Mixtures after wheats;  
Mixtures after winter wheat or winter barley;  
often wheat, flower seed, grass seed, beans and then choice of cover crop depending on nematodes and weed control chemical;  
corn potatos, japanese oats;  
grain, leaf radish;  
permanent undergrowht, doesn't matter what;  
see earlier answer;



**Innov;**

yellow mustard after cereal;

flower mix;

Japanese oats with leaf radish after winter wheat;

grass after potatoes and cauliflowers";

Yellow mustard, facelia, leaf rans and grass mixture after every cultivation;

japanese oats after peas beans wheat corn;

Yellow mustard with leafy radish after wheat or peas, Japanese oats after corn;

yellow mustard, even after corn;

yellow mustard after corn;

cut rye or ryegrass after corn;

too big of a story;

grass after maize;

Grass or cutting rye, pre-crop grain or corn;

grass after maize;

see previous;

Italian ryegrass after corn;

cutting rye;

cutting rye;

grass;

grass after grain;

grass after anything;

grass after maize;

rye and ryegrass;

grass and rye after corn;

Yellow mustard after winter wheat, winter field beans and early silage maize;

grass behind corn;

so this year I will use egyptian clover for the first time on my mix / green manure trade because there is now (Feb-Mar) a growing mix of winter cabbages (sprouts, red cabbage, savoy, kale, ...) on which I keep harvesting until the end of March / beginning of April and where thereafter partly potatoes and partly fallow and partly late leaf crops must come. Because I couldn't feed compost on it this spring, I want to improve the organic matter of the soil by applying a fast-growing green fertilizer that is certainly not winter-proof and where possible interesting for insects / butterflies. I chose egyptian clover more by feeling than by knowledge, although of course I did read its characteristics in the catalog of one of my seed suppliers;

yellow mustard and phacelia after winter barley and oats;

grass mixtures or mustard / facelia after grains or early carrots;

Japanese oats or grasses;

Japanese oat lettuce;

grasses enphacelia with oats;

Yellow mustard after wheat;

corn rye;

see previous;

japanese oat;

corn than grass, fodder beet than rye,;

cut rye after corn;

Mustard after wheat. Rye grass after barley;

Grass;

Cut rye after corn;

mustard and co na grain dorsmais straw on field beet leaves on field;

Yellow mustard facelia. After winter wheat and winter barley;

apply mixes;

grass and yellow mustard after grain, pea, sugar beet .... crops harvested before 1 Nov;

yellow mustard after cereal;

grass;

grass and rye corn or potatoes;  
Wheat ryegrass. Wheat yellow mustard;  
Grasses yellow mosred;  
Corn yellow. Rye or Italian ryegrass;  
oat+wikken;  
There is grassland on all my soil, so that is a green fertilizer during the winter;  
Japanese oats, facelia, ... after early potatoes, or on fallow tree nursery plots.;  
Grass tritecalle, corn, fodder beetroot;  
After barley comes mustard with black radish;  
Oat + wikken;  
"Italian grass. In 2016 I sometimes sowed a number of hectares with ""Landsberger Gemenge"" (search on Google)";  
grass;  
Japanse oat cereal;  
grass after barley;  
yellow mustard or ryegrass after cereal;  
grass after maize;  
as previously stated after grains and beans;  
**7 import other organic material (sewage sludge, industrial organic wastes);**  
**If yes, which other organic materials;**  
**NLR;**  
sewage sludge;  
organic residues;  
both;  
generally I am open for import of organic materials;  
sewage sludge;  
everything that is possible;  
only from the resources at the farm - have forest;  
sewage sludge;  
biocoal;  
several types - but not sewage sludge;  
biowaste;  
livestock manure;  
sewage sludge;  
sewage sludge;  
sewage sludge;  
sewage sludge;  
sludge;  
Sewage sludge provided guaranteed free of heavy metals;  
livestock manure;  
sludge;  
sewage sludge;  
sludge;  
wood chip as soil cover for berries and other perennial cultures;  
they must do something about the millet problem;  
manure from fur farming;  
sewage sludge ;  
sewage sludge ;  
Biochar would be optimal;  
sewage sludge;  
sewage sludge;  
"If sewage sludge is approved ""ecologically"" I would have used that";  
no idea;  
sludge etc. if approved;

sewage sludge;  
sewage sludge, rest fra biogassanlegg;  
sewage sludge med kalk;  
own production of biocoal and in search for material from external biowaste burning plants ;  
sewage sludge;  
sludge;  
sewage sludge;  
sewage sludgem;  
sewage sludge;  
sewage sludge;  
sewage sludge, men m $\frac{3}{4}$  v $\frac{1}{4}$ re fri for tungmelivestock manure. ;  
sludge;  
sewage sludge etc.;  
compost, manure;  
sewage sludge;  
sludge;  
sludges from energy production;  
sewage sludge;  
sewage sludge;  
more sewage sludge;

**Thuenen/3N;**

sewage sludge;

**Inagro;**

green compost;

**Bionext;**

Organic manure from own cows interesting to treat to increase carbon content, Groenco"peratie in the Gelderse Vallei interesting to use bermmaaisel to make bokashi;  
I would like to use grascllover as another input of organic material;

**ZLTO;**

Digestate from biogas plant;  
chalk;

**Innov;**

foamed earth, paper lime;

digisgtaat van biogas;

Slib van interbrew;

Houtsnippers;

ik sta open voor suggesties, maar het moet kunnen binnen m'n bio-lastenboek en gewasrotatiesysteem;

champost;

zie vorige;

Dikke fractie van digestaat. Schuimaarde;

organisch afval uit de voedingsindustrie;

materiaal met vertrouwen;

Organisch afval;

gelatinealk;

**7 reduction in till ;**

**if yes how**

**NLR;**

tillage;

spring plowing, direct sowing, but the grants are minimal now;

possible - sowing technique;

not sure;

maybe;

is open for the thought but see cultivation challenges in vegetables ;

direct seeding;

not sure;  
more direct seeding;  
no ploughing;  
renew meadow without plowing;  
no ploughing - reduce tillage;  
surface composting and sowing;  
By working up better soil health and structure over time -, the hope is to be able to direct sow the whole area;  
when possible;  
reduce ploughing;  
reduce ploughing when weeds pressure allows;  
especially for winter cereals;  
practice simplified tillage;  
only cultivator or direct seeding;  
fast growing grasses, use hand held tools;  
direct seeding;  
no ploughing -targeted grazing;  
no ploughing;  
more disk harrowing - direct seeding;  
direct seeding;  
tillage;  
no ploughing;  
composting at the soil surface;  
direct seeding;  
no ploughing, direkte sowing;  
soil cover - grasses and berries;  
perennial wheat;  
spring-ploughing;  
direct seeding;  
I practice seed grain production and must therefore plow in the autumn to reduce sprouting of wrong species  
and variety;  
weed tillage;  
not sure;  
Direct seeding;  
no ploughing;  
direct seeding;  
I am open for reduced tillage that but see many challenges with regards to root weed;  
pesticides-direct seeding;  
increase meadow time, direct sowing;  
reduced tillage when applicable;  
no ploughing;  
direct seeding;  
do not plough;  
no ploughing;  
direct seeding;  
no ploughing, direct seeding;  
direct seeding;  
no ploughing;  
bare tillage;  
but we must first get the machinery we have into operation and then use it. We have a lot of weed that can be  
solved by pesticides or tillage, if possible choose tillage.;  
direct seeding;  
reduced tillage;  
reduce ploughing;  
when grassland is sown;

increase in tillage;  
no ploughing;  
disktillage and direct seeding.;  
no till;  
focus on long lasting grass cultivation;  
Jordfres;  
no ploughing;  
direct seeding;  
reduce ploughing to a minimum or only non turning cultivation;  
no ploughing;  
unertain must learn more-but direct sowing for intance;  
Try to reduce as much as possible. If I get rich I will bye a new machine for direct seeding.;  
lots of possibilities;  
direct seeding;  
not with the equipment I have today;  
oossibly renew meadow without plowing;  
higher crop diversity and changed tillage techiques;  
no ploughing;  
direct seeding;  
direct seeding;  
**Thuenen/3N;**  
shallow cultivation;  
reduced ploughing;  
mulch seeding if there ist enough herbicide avaible;  
so far as possible in organic farming: forego the ploughing;  
mulch seed: cover crops-beet, partially wheat-maize-rye;  
enhance if possible;  
more permanent grasslands;  
**Inagro;**  
reduces tillage;  
mais without plowing;  
no plowing;  
yes;  
less plowing;  
less deep plowing;  
**Bionext;**  
We will plough less and less;  
We want to use an Ecoplough, moving toward reduced tillage;  
We would like to work no-till;  
No-till interesting;  
In the future maybe no-till or ecoplough;  
Ecoplough, putting cover crop into the soil;  
Ecoplough, but then I need a heavier tractor, also not great;  
Eco plough;  
**ZLTO;**  
tried before, went well becasue of the drought and, and if roundup is applied;  
no tillage;  
No tillage;  
tossing instead of plowing;  
because of better structure les intensive soil tillage0;  
Not plowing before planting winter wheat;  
Reduce plowing;  
tossing, cover fruit growing;  
depending on crop: less plowing;

**Innov;**

no tillage if possible;  
non-reversing tillage;  
actisol decompaction;  
sow wheat without plowing;  
Plowless for growing corn.;  
less tillage;  
continue as we currently do: semis direct;  
Minimal plowing, shallow working, combining working hours;  
no till;  
edit as little as possible;  
no till;  
deep soils instead of plowing;  
deep wrench;  
more grassland;  
tossing;  
Less classic plowing. Use of erosion plow and combination sowing techniques;  
plow with front packer;  
looking into the use of an actisol in the long term;  
less plowing;  
some plots are just deep digging;  
less plowing;  
weeding;  
tossing instead of plowing;  
digging or limbs emerald, not plowing;  
no turning tillage;  
Multiannual cultivation, English grass seed;  
Only fertilize, plow and sow;  
no till;  
Deep soils;  
less plowing;  
Sow without plowing;  
less plowing if possible;  
no turning plowing instead of plowing;  
Plowless (only plowing when the corn land was driven too stiff during the harvest;  
see earlier;

**7 stimulation of soil biology;****If yes, how;;****NLR;**

no idea;  
more and variable cover crops ;  
direct seeding, cover crops;  
undersown av white clover;  
biocoal;  
green cover whole year;  
further develop the scheme I have;  
different use of area;  
more livestock manure;  
no idea;  
manure and underseeds;  
I hope for increased biological activity when I mold downcover crop";  
does not work;  
compost, reduced tillage, holistic management/grazing;  
Maybe;

grasses;  
liming;  
continue and get better at what we are already doing;  
reduce tillage, mulch, perennial cultures, compost, cover crop;  
minimal till, crop rotation and cover crop;  
manure;  
more lime in the apple orchard;  
try to optimize;  
need more knowledge;  
nor sure;  
crop rotation;  
targeted grazing;  
Improve hydrotechnical plant, large area as grazing area;  
biochar, pasture for the pig, improved deep litter use, playing with bokashi at a small scale;  
green manure;  
direct seeding;  
no idea;  
Sludge, livestock manure if I can get a hold of it, regrowth;  
no ploughing;  
targeted grazing following a good plan;  
add also biochar ;  
no tillage;  
organic farm, minimum ploughing and tillage;  
liming to increase pH in an optimal range for biological activity use of more livestock manure ;  
increase plant growth, good agronomy, GPS liming, biochar;  
undersown;  
no idea;  
Biochar and meadow in higher amounts and adding of garden waste compost;  
undersown;  
no idea;  
cut straw, light harrowing;  
cover crops;  
compost;  
evaluate the possibilities;  
sequester carbon to increase the content of organic matter in the soil;  
avoid soil compaction;  
cover crops;  
cover crops i cereals;  
cover crops;  
undersown/ after crop. ;  
no idea;  
improve composting of manures;  
everything that can be done within the current production;  
change tillage regime;  
no pesticides;  
minimize ploughing;  
**Thuener/3N;**  
shallow cultivation;  
with horse manure;  
not so early mulch;  
humus formation ;  
problem: the right soil biology (nematodes, wireworm);  
solid instead of liquid manure;  
**Inagro;**

deep tillage;

see 5b;

cover crops;

compost;

soil improving products (humifirst);

manure;

**Bionext;**

Using solid manure on pastures that are compacted by bad management;

compost and bokashi stimulates soil fauna;

Tried granulated chalk in the past, could try that again;

**ZLTO;**

Mentioned earlier;

cover crop mixtures;

No tillage;

cover crops grass seed cultivation, champost or compost, betacal, in the past apply plaster;

see earlier answer;

cover crops;

wide crop rotation;

no tillage, apply Biovine and fulvine;

see earlier answer;

**Innov;**

compost and stal manure;

PRP (Neosol) sprinkle in the fall;

compost,compost tea;

go on;

apply organic fertilizer;

see earlier;

see earlier;

improve organic material and general soil condition;

pull up;

is made alive by not clogging up in the autumn, by making sure that no water or puddles remain on the land, so

cultivate in the autumn so that soil life remains optimal;

bring straw of cereals in the ground;

ventilate the ground;

limping;

I am open to tests with bokashi and / or effective microorganisms or ... ??;

compost, green manure, soak in straw, grass clover in cultivation plan;

mixing crops;

Leave the soil covered as much as possible during the winter;

no heavy tillage under wet conditions;

deep soils;

feed carbon, straw manure;

see earlier;

aeration of soil;

Less tillage, grass under plowing;

Only edit field if not too wet;

Green fertilizer and stable manure;

deep-rooted plants, increase organic matter, minimal tillage, working in dry conditions;

stal manure;

drainage;

very difficult to store with humus!;

Use more farmyard manure as is currently allowed in the rest of Europe, but our manure law must be amended for this;

make use of organic fertilizer, maintain pH level, ?;



Sometimes humic acids use;  
dragging the meadow through organic fertilization;  
stal manure;  
stal manure;  
prp sol;

convert manure to compost;  
an open question;

**7 other techniques of interest to increase the organic carbon in soil;**

**If other, which ones;**

**NLR;**

-;

**Thuenen/3N;**

agroforestry;  
to plant orchards;

**Inagro;**

-;

**Bionext;**

Planting trees in outside chicken range;

We're doing a lot already, small corrections can help, but the margins are small, optimizing reduced tillage;

**ZLTO;**

tramline system;  
harvesting tramlines;  
less deep plowing;  
apply zeoliet or other rock;

**Innov;**

Nog nader te bekijken;

houtsnippers inwerken;

aanleg grasland;

zolang het maar past binnen m'n huidige teeltrotatiesysteem en bio-lastenboek, de reden dat ik bv houtige gewassen niet zie zitten (bv agroforestry) is dat ik vermoed dat ik hiervoor te weinig oppervlakte heb: ik moet vlot m'n akker kunnen blijven bewerken in een sterk roterend teeltsysteem (8-9 slag stelsel);

geen chemicaliën en geen kunstmest;

Begeleiding en informatievergaderingen;

zie vorige;

Bekalken, stalmest, brede banden op lage spanning, meer dierlijke mest ipv kunstmest;

fermenteren in plaats van composteren;

**7a What is actually preventing you from taking measures to improve carbon levels in soil? (you can choose multiple options);**

**Comment other reasons ;**

**NLR;**

-

**Thuenen/3N;**

lack of (chemical) substances;

lack of experience;

I learn continuously;

the major part of the field of the farm is leased;

technical possibility;

bureaucracy and documentation;

**Inagro;**

when you have too much carbon, a lot of mineralisation and this is not good for chicorie;

O E;

I have paid enough attention to this;

climate (going no further than necessary) heavy soil texture;

manure legislation does not allow this;

manure legislation does not allow more manure;  
manure legislation;  
nothing until you don't have any result;  
sometimes too late in the year;

**Bionext;**

There doesn't exist a business model for planting trees yet, Sequestered carbon doesn't get compensated;  
Nothing;

I'm not such a frontrunner, like to see if it works for others first;

Too much plastic in the compost we used in the past;

With no-till weeds are a problem, more research needed, especially on heavy clay, we are doing research ourselves as well;

Sharing experiences, there is too much P in our soil, difficult to import organic material;

Not so important;

With no-till there is the risk that you need to weed a lot, this can cost a lot of extra fuel, also increasing your footprint;

**ZLTO;**

Weed pressure;

Practical reasons, for tramline system exchange of machines is difficult;

Fertilizer application is more convenient, organic manure not always there;

Injecting manure is harmful to the soil, applying it on the soil is positive;

Possible disappearance of glyphosate makes no tillage impossible;

**Innov;**

The phosphate fertilization standard is an important limiting factor in the supply of humus;

I already take measurements;

manure law policy is not ok;

Are the costs also cost-effective?;

none;

do not have the necessary machines;

Nothing prevents us, we are already fully engaged in it;

I ALREADY DO THIS;

If you do not tear a meadow for 5 years it will become permanent grassland and we want to avoid that;

water quality management;

limited mechanization;

as with climate, it does not immediately produce a result.;

knowledge is missing to compost manure;

**8a Which measures to bind carbon in soil could be paid for in your opinion?;**

**Comment which measures;;**

**NLR;**

no idea;

cover crops;

cover crops ;

cover crops;

All measure must be payed for to get the economy going, I am positive to ideas, but investments/economy stops this;

direct seeding, green plant cover in complete autumn;

I am unsure;

cover crops;

Forest waste to biochar;

have green plants together with other cultures;

biocoal;

All measures that sequester carbon should be payed for. If we can prove that we sequester carbon it is something the society should pay us for doing in addition to make the food;

biocoal, compost;

Increase green manure supplement and subsidy for cover crops;

cover crops, direct seeding;  
all;  
cover crop use of biochar, measures/grants against autumn plowing;  
biocoal;  
All. Especially those who have multiple effects on reduced runoff, insects etc.;  
green plant cover the whole year long, soil tillage maximal 6 cm deep;  
cover crops;  
Cultivation methods that increase the content of carbon in the soil, cover crop, no till. Payment requires documentation on increase in carbon via soil samples.;  
cover crops;  
I am tired of all the talk of climate crises and all the silly inventions by expensive consultants;  
no idea;  
Do not have enough knowledge to evaluate such measures.;  
Grants for new machineries;  
increased crops;  
ash from chip firing as a source of lime? cover crop?;  
grasses;  
humus enrichment;  
soil tillage;  
no idea;  
I have too little knowledge to think on something;  
organic farming;  
All measures that be documented and do contribute, can in principle be payed for. Undercrop/cover crop in grain and other annual cultures are effective and well documented. So this should be startet soon!;  
cover crops, measures to reduce soil tillage, multiannual grasses and grazing ;  
biocoal;  
Burn carbon linked to energy outlet;  
no idea;  
biocoal;  
reduced tillage, redistribution of communal sewage sludges;  
biocoal, sewage sludge;  
reduced tillage;  
use of more livestock manure;  
measures approved by experts ;  
Do not have sufficient knowledge to answer;  
field work documentation and culture plan, grazing;  
cultivating of grasses, grazing and wood processing in the forest;  
ploughing in biocoal;  
not sure;  
no idea;  
biocoal, recued tillage;  
cover crops;  
The measures should in itself be profitable;  
I wish to return to this question.;  
Grant to sow cover crops;  
Sow cover crops after the main crop, use of safe compost in open fields/underseed, reduce tillage that does not lead to increased use of pesticides.;  
Measures that is prooved functioning and that does not increase the weed problem. We must get much more knowledge under Norwegian conditions before we conclude with what functions best.;  
use of cover crops, undersown crops;  
growing various grasses;  
input of organic material;  
Production and use of biochar. The farmer can sell the effect of the char that is put in the soil, and get the reward in increased amount of crop and without effect on the prices on the goods.;

Do not know, but it the measure entails that the crop does not generate income , the measure itself must give a payment.;

no idea;

sow catch crops;

crop rotation and farming practice;

compost;

biocoal;

not sure;

all;

Everything that involves extra cost;

cover crops;

biocoal;

cover crops and ban of Glyphosat use;

Introduce support for undercrop via the Regional Environmental Program;

reduced tillage, targeted grazing;

Know too little, but it is interesting. Must learn more about this before I can say something;

More money(?)support for several measures;

care of young forests and planting of trees;

products produced according to effective criteria ;

all;

Field margin strips with nitrogen catching (fixing?) plants;

no idea;

What can be measured by carbon sequestration;

**Thuener/3N;**

using of compost;

using cover crops;

CO2 sequestration;

cultivation of cover crop, work with compost;

afforestation, positive humus balance;

it could be for me the result of your work with such a model. Necessary is: 1. viability 2. economic efficiency;

cultivation of cover crops;

forego ploughing";

it should be a political will. At the moment the humus enrichment will be considered as a detrimental process.

So in my opinion it makes no sense.;

afforestation;

cultivation of cover crops;

afforestation;

transform arable land to grassland ;

improvement of the grassland through seed mixtures which offer improved carbon binding;

permanent carbon sequestration, ??;

**Inagro;**

soil improvers, seed cover crops;

more use of compost but legislation does not allow. Economic not possible, winterwheat is very good, but no financial marge;

Compost;

use of compost;

not recieve anything;

by trying certain thing, the loss of yield on crop production;

payment for hours of global subsidies;

payment for hours;

seeds of cover crops;

standard fee for the costs euro/ton compost or cover crop;

pay for extra work and loss of yield compensation;

use of cover crop, reduced tillage;

cover crops and flower (visual attraction);  
Compost;  
subsidies;  
Compost;  
making compost;  
own earn model;  
machinery against erosion;  
loss of yield, higher cost of using techniques;  
cover crops;  
fitting for heavy soil textures and historical grassland;  
costs for weed control when no tillage, cover crops;  
erosion plow;  
permanent grassland, woodbarriers;  
grass-crop rotation, manure;  
permanent grassland;  
keeping permanent grassland;  
all;

### **Bionext;**

Extra possibilities for landscape management, allow bigger surfaces;  
Measuring how much CO<sub>2</sub> is sequestered in the soil in a season, paying this amount to farmers based on the CO<sub>2</sub> price;  
Knowledge support, Innovation subsidy;  
Match subsidies with woody crops and increase in OM content;  
Composting and usage of green material;  
Increasing OM content in the soil;  
To take care of this is part of organic farming, therefore we need to receive a good price for our products and we need to get out of the general regulation of conventional agriculture that restricts us unnecessarily ;  
OM content in the soil, age of grassland, percentage grassland;  
Depends on the farm;  
Using solid manure, using reed, regional circular farming;  
A lot of the measures are already used in organics, would be too little to pay extra for that;  
Green energy, carbon in the soil is tricky, when I change my way of working, it will be gone;  
We are still using too much fuels, first get that right;  
Adding chalk for example;  
Planting trees;  
Difficult to proof improvement;

### **ZLTO;**

sustainable energy electrical tractor, no tillage;  
cover crops and closing the business cycle;  
cover crops they have a long showtime for other people;  
cover crops visible less or no tillage;  
more mixtures;  
cover crops;  
3 meters along the ditch opportunities for drift reduction;  
more room for the basic;  
undep plowing;  
adjust mechanisation;  
stimulate by a plus in the market;  
switch to no tillage company-wide;  
regulation by the Netherlands Enterprise Agency to pay for CO<sub>2</sub> storage, revenue models, without the intervention of 'experts' who take too much of the margin. It should not be too complicated (it usually becomes) an involve too much paperwork. In addition, the money should not be in the hands of the few top farmers who are surrounded by entrants and experts who guide them through the subsidy forest of the Ministry of Agriculture. Combine with the combined tasks and stimulate use of cover crops that bind CO<sub>2</sub> and stimulate farmers who act a little

different instead of directly excluding their vision. So also include farmers who plow and grow cover crops. Don't let just the no tillage growers benefit. It must be widely supported and be practicable.;

- extra compst;
- pay for crops that stimulate this;
- greenbreak' for which you receive a good compensation;
- cover crops, broadening of placement room for organic manure;
- hummus build up, capture CO2;
- apply external fertilizer and compost;
- Achieve positive organic matter balance every year;

**Innov;**

- compost;
- sowing the right crops;
- grow crops normally, but no longer harvest them. Everything is therefore incorporated into the soil again. In this way the established CO2 is not released again.;
- supply of organic waste from greenhouse companies, industry;
- Sow green covers earlier and then mechanically destroy farm composting;
- work machine;
- pastures to use longer without tearing all crops that store carbon in the soil eg sugar beet, ...;
- Moving temporary grassland.;
- incorporating wood chips, rotation with a crop that is fully incorporated;
- grassland, green manure;
- no experience with that;
- stop deep tillage, as a result, the organic matter in the soil will no longer burn out as quickly.;
- compost;
- compost;
- Adjust additional costs / other machines, training and knowledge acquisition, possibly price support / guaranteed sales of biomass, financial compensation at lower yields than conventional production methods / crops;
- Wood shredding;
- make compost more accessible. Pick up at 23 km is too far for me;
- Help pay for soil analysis and not always pay;
- agriculture in flanders is much too intensive, otherwise don't earn your living here;
- permanent grassland (without cracks);
  - wood edges;
- example miscanthus only grow to increase the om content;
- with intensive agriculture, only compost with a low nutrient content is possible, as there is a limiting factor in terms of fertilization, adhering to rules or standards imposed by vlm;
- measure for chopping straw from cereals;
- clovers, alfalfa, or soya;
- Keep the meadow longer;
- versoepeling van de regels van de mestbank;
- geen idee;
- staalnames, grondbewerking, groenbemesters, gewasresten;
- Compost aanvoer;
- allen;
- geen idee;
- weet niet van nieuwe maatregelen;
- houtachtige gewassen compostering ;
- toepassing compost, soepelder mestwetgeving;
- grasland behouden (nu economisch niet interessant om deze niet te scheuren na 3 jaar). Stro gratis naar landbouwers als organische stof ipv voor biogas;
- deel van de kost van zaad groenbemesters en externe organische bronnen deels terugbetaalbaar maken;
- gewasrotatiesystemen die hun effectiviteit bewezen hebben steunen (zoals in het bio-omschakelings premiessysteem);
- kennisverdelingsystemen van proefcentra steunen staalnamekosten deels terugbetaalbaar";

inzaaien van blijvend grasland;  
groenbedekkers, niet onnodig loswerken van de bodem in het najaar, promotie voor bewustmaking;  
toevoegen houtsnippers aan de bodem;  
landbouwers betalen om houtkanten te onderhouden om dat te recupereren in de bodem om zo het C-gehalte te verhogen ;  
groenmest;  
alle;  
Bodem verbeteraars;  
weet er te weinig over;  
aankoop zaaigranen voorphacelia en grassen terugbetalen;  
Ploegloos werken;  
nogmaals geen idee;  
NERGENS VOOR BETALEN !! ALS BIOBOER IS HET ONZE VERDOMDE PLICHT OM VOOR HET MILEU/ KLIMAAT TE ZORGEN !!;  
te weinig ervaring;  
TELEN GRONBEMESTERS MET ECONOMISCHE WAARDE , RESTFRACTIE ALS GROENBEMESTER;  
data is geld waard, enkel al het aantonen van koolstofopslag is van waarde,als hier uit geput kan worden kunnen minder economisch/teelttechnische technieken wel rendabel gemaakt worden door fondsen, niet veralgemenen , enkel voor de geengageerde mensen anders mist de inspanning het effect van opslag;  
Geen. Ik hou niet van giften;  
Geen idee;  
Geen idee;  
Groenbemesters, compost;  
Compost en Spreiden ervan;  
compensatie voor compostgebruik;  
Groenbemesters;  
toediening van organisch materiaal zoals compost, stalmest, houtsnippers. toepassen van (bepaalde) groenbemestingsmengsels, bepaalde methodes van niet kerende grondbewerking. ;  
uitzaaien van bovenwettelijke gepaste groenbemesters. Uitzaaien van graan met inwerking van stro. ;  
Actief houtkantenbeheer voor bedrijfseigen bruin composteringmateriaal;  
meer grasland;  
compost toevoegen;  
maaimeststoffen toedienen";  
samenwerkingen tussen intensieve groentetelers en intensieve veehouders (landbouw wordt steeds specifieker en intensiever, gemengde bedrijven (wat goed is voor bodem) komt steeds minder en minder voor in vergelijking met vroeger (stalmest/compost etc. op je land voeren om de 3-4 jaar bvb?);  
Betaalbare compost / zelfcompostering;  
agroforestry ;  
gratis compost ;  
map aanpassingen qua hoeveelheid mest te gebruiken";  
Blijvend grasland: nu brengt een weide met vleesvee niets op maar als ik ze omploeg en verhuur voor aardappelen krijg ik minstens 1500 euro en heb er dan ook nog weinig werk aan;  
Teelten met een grote hoeveelheid gewasresten, korte teelten waar groenbemesters erna kunnen ingezaaid worden. Onderzoek naar betere groenbemestermengsels die nog meer biomassa aanmaken in een kortere teeltduur. ;  
Gras teelt;  
Alles wat haalbaar is en rendeerd. ;  
gras en grasklaver in rotatie niet scheuren blijvend grasland gebruik stalmest;  
Transport compost is duur;  
Toedienen van bv. Vlaco compost schrappen uit mestwetgeving. Bodemonderzoek met CEC subsidiëren, beschikbaar stellen van houthakselaars om de perceelsranden te onderhouden en de snippers op het veld uit te spreiden. ;  
Aanvoer OS stimuleren;  
alle maatregelen verdienen een steuntje in de rug. ;

vergoeding voor blijven grasland;  
inwerken compost en houthaksel;  
compost;

Historische weiden opwaarderen door GLB. Omzetten van stalmest naar compost;  
zaai van groenbedekkers toepassing van no-till gebruik van compost toepassing van niet kerende ONDIEPE  
grondbewerking;

**8b To get paid for, it is necessary that it can be verified what you have done to increase carbon binding in soils.  
Which measures to bind carbon in soil do you think are possible to verify? And how? Give examples;  
Comment on verification;**

**NLR;**

no idea;

cover crops;

Must be based on what one do and grows rather than the meareable effect;

plant trees;

Take photos and archive in the quality system with dates;

Measure humus content in 10 years?;

no idea;

Aerial photo that shows the carbon level in the fields, higher grant class when higher levels of carbon. This will  
stimulate the farmer to increase soil carbon the most effective way.;

cover crops, input of carbon binding materials, reduced tillage;

In writing and photos with random controll form the body who pays the grant;

nothing, try to get knowledge;

By for instance weighing the biomass per m2 in the autumn. I know too little;

Incorporate in the fertilizer mangement plan. Random sample control, input factors from outside can be  
documented by load receipt.;

Area accounting;

Cover crop and direct sowing. Easy to document;

All, just have the measure the changes in amount of organic matter and pay for the change;

cover crops, autumn-ploughing, biocoal;

biocoal;

Document as other Regionl Environmental grant and production grant;

Green cover most of the year should be possible to document;

Would think that it is easiest to document the effect of continous plant cover and minimal tillage. Is the soil  
sample not good for this?;

Sludge, livestock manure, reduced tillage, cover crop;

soil samples;

undersown crops;

yes. Cannot get paid for nothing;

no idea;

Do not have enough knowledge to evaluate such measures.;

production, vegetation time;

meadow cut with pasture topper - reception of sewage sludge;

sow gras seed after culture crop;

external control;

Document in the same way as we do it with other types of tillage;

I have too little knowledge to think on something;

grazing, crop rotation, ;

"The ""most sure"" documentation is measuring of content of organic matter and aggregate stability";

Tillage is very easy to see in practice. Same with cover crop. But to measure the capture is maybe a bit more  
uncertain;

grasses, biocoal and humus contents;

no idea;

biocoal;

no ploughing;



manure application and cover crops ;  
Do not have enough knowledge to answer;  
crop rotation, grazing, manuring, cultures, soil tillage: accounts;  
ploughing in biocoal can be documented by application plans and buying receipts;  
not sure;  
no idea;  
By the same accounts we use also in production;  
proof of soil cover, grazing plan;  
received biochar, received sewage sludge and other from approved supplier;  
I wish to return to this question.;

cover crops;  
Sow cover crops after the main crop, use of safe compost in open fields/underseed, reduce tillage that does not lead to increased use of pesticides.;

difficult to document this other than as a RMP measure;  
undersown crops;  
Production of biochar in barrels. Maintain log of production, and be open for control by random sampling. When furnace of biochar that produces continuously is developed, we can unscrew the charcoal from the boiler;  
Most of actions that has been taken of this should be possible to document.;

reduced tillage, use of manures;  
sow catch crops;  
crop rotation and farming practice - documentation by pictures, documents of delivery of organic materials ;  
compost;  
not sure;  
You should be able to see this;  
Photos, delivery notes/receipts possibly with estimated working hours;  
soil samples every 5th year;  
undersown crops in cereals and ban use of Glyphosat;  
Measure ignition loss, photo of undersown crop etc. Signature of application, with possible sanctions and return of payment when cheating.;

Less tillage and target grazing should be possible to document.;

document methodes, grasses and areas;  
Logging / making a log;  
reduced tillage;  
farm accounts;  
Organic levels in soil is an index but takes time to change;  
field journal accounts and digital pictures;  
no idea;

**Thuenen/3N;**  
application of compost;  
measurement of humus;  
almost all the data that will measure on the farms are in my opinion not suitable for the CO2 - balance. For the first years of the work wit the pilot farms it should be used the approximate data. To verify the date at the very beginning and to hope, that it could be earned money with the CO2-pricing.;

cultivation of cover crops could be visible;  
fertilising low with only +10 kg P2O5 per year stays against carbon enrichment;  
compost, crop rotation;  
legumes;  
land mangement records, invoices and receipts on seed-purchase, photographic evidence at day of seeding;  
difficult as estimation procedures for verification is necessary;

**Inagro;**  
soil samples;  
soil samples;  
manure exchange between neighbours, paying bill;  
very depending on the region (heavy rain fall is also local);

looking at the fields;  
to rely on;  
to rely on and seeing the results;  
control on the field;  
compost by paying bill, sowing of cover crops;  
crop rotation;  
putting compost available;  
carbon content by soil analyse, other analyse (HWC);  
sampling;  
compost;  
soil sampling on the field, fertilization plan;  
soil sampling;  
soil sampling of C;  
no idea;  
by collection of governmental data;  
no idea (keeping grassland area);  
collection by governmental data;  
field control;  
keeping total area grassland;  
crop rotation, manure, collection by governmental data;  
collection by governmental data;  
on short term: use of the product, on long term: soil sampling for C content;

**Bionext;**  
Counting trees as crops for RVO;  
Cool Farm Tool input minus output (including transport, cooling etc) or measuring OM content on the same date, soil and temperature;  
Cultivation plan with trees and shrubs, measuring OM content;  
Measuring OM content soil;  
Measuring OM;  
Don't pay, don't control, it just belongs to farming to take care of this;  
Percentage grassland and age, OM of soil samples;  
Measuring more important than measurements, farmer has to decide what works himself;  
Measurements difficult, we are doing it like this for years, maybe we can use even more reed;  
Measuring OM, but it would be better if it was known what the effect is of the different measures you take, we would like to have a quantitative view of the circularity on our farm, then it's easier to tell a third party what he is paying for, but that would be a lot of work, to do for every individual farm, better to do it as a group of farmers;  
Soil samples, measuring OM;  
Measuring OM;  
I don't know;  
Measures instead of measurements;  
Via gecombineerde opgave, or control union, or skal, an organization that checks already, using this administration, no extra controlling, measuring carbon;  
First, calculate what the effect is of different measures;

**ZLTO;**  
none;  
How do you reward someone who already does a lot and has a high percentage of organic matter in the soil? ;  
reward for extra work;  
bring manure with high organic matter into your business cycle ;  
less tillage and more cover crops;  
grass organic manure;  
pay for things that we do now;  
very difficult to control, but after years of tilling instead of plowing should there not be a plow sole anymore?;  
check on behalf of the consumer whether you meet the requirements;

I find this a difficult question. when it has to be done according to a protocol, then it often becomes less practically workable. (just look at our manure legislation);  
see above and, for example, using satellite images to check cover crop destruction data;  
pictures and invoices ;  
via GLB;  
satellite control, woody crops can be reimbursed per kg;  
soil samples;  
Chroma and respiration measurements soil;  
make carbon balance;  
Calculate organic matter balance;  
**Innov;**  
green manure compost delivery notes;  
purchase invoices, keep track of sowing date, check on-site if the crop is there;  
Every company uses an agreed portion of its area for CO2 capture. We grow normal crops and do so according to good agricultural practices and strive for normal yield. However, harvesting is not taking place, but everything is incorporated into the soil again. In this way all the CO2 captured is introduced into the soil. For example, one could use sugar beet for this. Regarding the inspection, it must be checked whether the cultivation occurs on the agreed plot and the harvest must remain on the field. The presence of the crop can be checked via satellite images. The yield per hectare can possibly also be determined via satellite images. The cultivation is not sold, but must be destroyed and processed. This can be checked by checking for destruction on an agreed date.;  
Measure C levels;  
Analyses;  
grassland maintained via soil samples and sowing of green cover;  
Moving grassland. By growing grass for 4 to 5 years, the carbon content increases. Then one can tear that parcel again and temporarily grow grass on other parcels.;  
A payment based on measures seems difficult to me. I see more in payment based on measured C content.;  
sowing catch crops and grassland;  
no idea;  
management contracts, take a soil sample every 2 ha;  
transport documents at the compost;  
The cultivation (e.g. short turn wood, miscanthus, ...) or green fertilizer is visible in the Soil analysis field gives measured results (longer term). Company scan or company check that demonstrates that techniques (can = present machines or equipment, ...) are used. for carbon bonding;  
Delivery of freight compost is controllable.;  
Give a bonus if you do it right, and not always punish as a disobedient child ...! ?;  
apply green manure, compost or other organic material;  
permanent grassland;  
wood edges;  
supply of organic matter with transport documents for certain crops, to be checked via declaration;  
measuring carbon.;  
Please keep it simple, all the land in Belgium is cultivated as much as it can, if financial support is given, do it in such a way that no land remains bare in the winter. In this way you can achieve the maximum with little support, so everything must be overgrown with a green fertilizer, this should be mandatory, taking into account the condition of the soil, wet soils cannot be sown, and even after winter fruits it makes no sense, a green fertilizer is difficult to germinate in winter. There are huge areas in the world that can be used to store C, here the Belgium margin is too small and becomes too expensive, much more than what we are currently exporting is unfortunately not possible.;  
they must come and see that straw is chopped;  
Through analysis the more phosphorus in the soil is a counter to better absorption of CO2;  
use more stable manure than permitted;  
no idea;  
crop residues, green manures, soil tillage material;  
Compost via the manure legislation. Only this should not be regarded as Manure;  
accepting wood chips and compost types. soil decomposition;

don't know;  
no idea;  
compost but what about manure legislation;  
humus content in the soil;  
everything is controllable provided that proper registration and follow-up;  
no idea;  
a limited specification: seed purchased or not;  
applied whether or not (show by means of soil samples?) the current bio-inspection authorities can, according to me, perfectly admit that, also on non-organic farms";  
the crops are known by the collective request invoices from seeds, compost and the like.;  
C content in the soil via a soil sample, compared to the average of the region, in such a way that someone who has already made a lot of effort in the past, is also rewarded for it., Sowing of green cover.;  
purchase invoices;  
all. simply measure the carbon content annually.;  
Follow up the rampant seasonal lease more;  
Soil decomposition;  
feeding manure to the stable increases soil life and that can be controlled;  
no idea, soil research??;  
Analysis taking into account climate;  
see earlier;  
soil decontamination and expert guidance;  
Ground ANALYSIS;  
recycle pointer, soil decomposition;  
I have insufficient knowledge for this.;  
No;  
no idea;  
no idea;  
Sowing soil-enhancing green cover plants (mixtures) and bringing compost (kilos);  
Apply compost via manure bank;  
compost use + soil analysis;  
green manure;  
check all measures through soil analysis at a specific time of the year.;  
carbon content, soil scans, plant scans, surface declaration, crop updates via satellite;  
Carbon content of the soil. Composition of proprietary compost. Number of running meters of managed timber edge. Trust in the farmer is expertise rather than a control system based on distrust;  
compost;  
easily traceable via collective request (livestock farmer / vegetable grower), including crop (wheat, grass, for example) in rotation (also via collective request);  
Apply green manure compost;  
Soil analyses / supply and removal per ha of organic material;  
with soil analysis but visible in the very long term ....;  
Pasture: is always controllable More farmyard manure: farmers would rather feed animal farmyard manure than expensive fertilizer, so there shouldn't be any control there;  
Opting for crops with many crop residues, short crops with options for sowing green fertilizers, using organic fertilizer, ?;  
Compost administration, shredding straw;  
Purchase invoice or by demonstrating that you generate humus on company;  
Perform analysis.;  
based on rotation - cultivation plan (e.g. demeter tool);  
Measure carbon content and pH;  
Compost Solid manure Green manure;  
Keep soil analyses available, supply documents compost, ?;  
Maize high supply of OM. I;  
"green manure: control;

fertilization: control manure bank over quantity and TYPE;  
measurement: soil analyses, remote sensing methods";  
control of cultivation;  
purchase of compost and chopping from third parties;  
compost, less tillage, more crop residues visible;  
Preservation and construction of permanent grassland. Developing techniques or legislation to ensure that the arable land that is converted into 'permanent temporary' grassland. The conversion from stable manure to compost is also controllable.;

ground treatment and green cover can be easily checked;

**8c If you have an idea for a business model to get paid for measures to increase carbon storage in soils, please write here below.;**

**Comment business model.;**

CO2 is put a price on today, can use this system;

We can easily calculate the emission on each farm. If the goal is to come to zero emission on your own farm, then we can for instance charge for the amount CO2 we are able to sequester on top of this.;

refer above, but that is not the definition of a business model that is used here. Read Zott, C., Amit, R. & Massa, L. (2011). The business model: recent development and future research. Journal of management, 37(4), 1019-1042. Måske skjæper begrepsbruken, økonomi er like seriøse fag som agronomi, jeg slår seg ikke rundt meg med agronomibegreper uten peiling.;

As far as I know there are examples of this from parts of Austria;

Communication / dissemination, and by taking a higher sales price.;

Do not have enough knowledge to evaluate such measures.;

I have too little knowledge to think on something;

no idea;

no idea;

Here the whole landscape should be seen as one, both forest and agriculture is important. The forest owner teams have the control and knowledge for environmental certification - this should be possible to expand to carbon certification. Every user then gets his share of carbon credits that can be proved based on this.;

Sale of food grown by certified carbon sequester practice, a new labeling scheme.;

Approve suppliers;

I wish to return to this question.;

Environmental agreement that focuses on the practical methods for sequestering carbon in soil, the same way as environmental agreements focusing on methods to reduce run-off of nutrients in regional context Environmental Programmes.;

This will probably pay off in increase amount of crop and reduced need to fertilizers;

We participate and we are interested in production of biochar according to the model above, however we are familiar with that the system for the time being is not down scaled to our level 250-300 kWh. We have the facilities and the infrastructure, but as of today we do not have the available funds to the take of facilities that does not work.;

Undersown crops in cereals;

For instance in Austria they have grant for sequestering carbon. To me that seems like a simple and good practice;

"Production of biochar and "feeding" with crushed biochar";

document methods, grasses and areas;

To loosen up the soil;

no;

Increased use of legumes and nitrogen fixing plants in meadow/fields to become meadow;

**Thünen/3N;**

we should find it together. Otherwise I could be now world-famous and millionaire;

the additional expense should be compensated: seeds, work, machines.;

no, it was for me until now not so necessary;

"the fertilising law should be changed;

otherwise this project can not work;

carbon enrichment is always linked to the phosphorus enrichment;

first can not work without the others";

bonus at about 500 ? /ha a for the transformation in to grassland;  
investor pays for the seed and for the amount of work and can look at the documents of the farmers from these fields at any time;

"CO2 levy with real prices;

permanent penalty for the CO2 emissions by industry;

**Inagro;**

forfait compensation for certain measures, sampling of increase is difficult;

no obligation;

subsidies;

subsidies;

subsidies;

depending on the measure, not on the surface;

subsidie;

subsidie;

subsidie by manure production;

subsidie, by GLB;

crowdfunding;

**Bionext;**

CO2 levy/bonus for all companies in the EU;

Measuring is knowing, via coolfarmtool it is possible to calculate CO2 footprint, every ton of CO2 that is sequestered annually can be payed by CO2 compensation programmes or the ministry;

Treating manure with carbon and micro-organisms, making Bokashi from organic waste, testing of no-tillage machinery and further development;

Reward measurable increase OM content, reward trees and shrubs in cultivation plan;

Sequestrating CO2 through increased OM in the soil;

Soil carbon, soil biology etc, it's part of normal organic farming practices, if you think you need to earn from this you show it's something special, what gives a wrong image of our sector;

Something like a crowdfunding with trees in the outside chicken range, something like that could work for the soil as well, get people involved, do business in a connecting way;

Subsidizing onderwaterdrainage in the peatlands in our area;

A biomassplant is a way to use regional organic waste material, could be financed externally;

I don't see why increasing carbon will cost money, the more people have something to say about your farm, the more difficult it gets, but more financial incentives are also always interesting ;

Lower rent for cultivation plan with more crops that give the soil a rest, make buyers pay more for crops from sustainable soil management;

Count for it in the price of the cheese;

Not a big fan of compensation, means that other parties can still have their emissions, would participate if there was not too much administration;

Government should do it, charge for CO2 emissions from the industry, give subsidies to farmers who sequester CO2, too much hustle to make individual agreements;

If you do well for the climate, it is good to reward, that can be through subsidies, for example the erfafspoeling project in Friesland, that worked;

It gets dangerous when money starts flowing, I would rather go for a fair price for the products, but if you want to develop a business model, I would go for a transparent system;

Mainly trees, in the outdoor chicken range or less fertile plots;

Via CAP, would be good if the government would support organic farming, measurements not on an individual level but for farmers as a group, like BDEKO or Biohuis;

Via gecombineerde opgave can you see what a farmer is doing, a model based on measures is too risky for fraud, it shouldn't be too easy;

**ZLTO;**

pay for days that cover crop is on the land;

pay for days cover crops on the land. Freedom in tillage is a requirement;

at least work and seeds. For example ?200 per 4 weeks/hectare;

at least ?2000 per ha ;

pay for the cover crops;

I wish I knew;

profiling in the market with support from the government;

I think the degree of ground cover can easily be checked with satellite images and set a fee depending on this;

see story above, I was already too far;

incorporate green into the soil;

Hectare compensation comparable with, for example, maize yield";

Expansion of placement room for organic manure. Free cover crop seed;

use GLB money for CO2 capture and humus building. See Austrian system!;

By applying C it is possible to determine how much CO2 is captured. Don't farmers in Austria already receive CO2 compensation?;

**Innov;**

The farmer is paid for the CO2 capture and no longer for the product that he has harvested, because he will work the entire crop in the soil. Sugar beet can capture a small 40 tons of CO2. If we do not harvest, we can store this CO2 in the soil.;

Sensitively increase C content in the soil by stimulating soil life and organic matter in an aerobic environment;

sowing green cover;

same as a discount on the purchase of compost.;

No;

management agreement;

Results soil analysis: premium for rising carbon content Extra premium for grassland Supporting biomass production .....

Advertise in all newspapers that the farmer likes to see his land and does everything he can to get the best out of it and that you cannot cheat land, if you give nothing, you get nothing!;

very delicat;

Economically, sustainable and vice versa,;

measure and reimburse carbon according to the values ??determined.;

If land has to be included again in a cultivation plan every year, so I think intensive agriculture is only by sowing more green fertilizers or temporary grassland that can then be plowed in or harvested in the spring, mowing and storing in a feed silo is also a C storage, C that is not immediately released, so a delay and therefore removal from the air eventually.;

the price of the straw that you otherwise pay in trade;

Abolish premiums from the age of 70 because these people are already entitled to a pension and distribute over the co2 klasse;

seniority permanent grassland compensate ground cover plants less soil turning operations grass sowing;

if there is a percentage increase in C soil in your soil.;

Allow manure to separate thick fraction on grassland;

no idea;

short circulation grow wood composting manure with green waste (currently only possible with own manure, own green waste);

management agreements (but more flexible than the current one, 5 years is too long, and too strict if there were one year that you could not meet);

what I am thinking of is actually already mentioned above ... but if you could also calculate what you can effectively save CO2 in the soil using the applied methods, it would also be an extra incentive, even though I am there convinced that the main reasons must be soil fertility ... (as I indicated what I thought important), because the soil is ultimately (together with water and the sun) your most important and indispensable production element;

no;

no idea;

By taking the above-mentioned basic rules from organic farming, we see that we not only deliver a much higher quality, but that we can also compete with conventional agriculture.;

is already underway, the dairy industry already has data related to carbon;

no;

no;

No idea;

no idea;

not really have a clue;

fuel tax (aircraft tax) -compost use-reward farmer or free contribution from climate marchers (there will soon be fewer);

First earnings model that reimburses directly processed amount of biomass and second earnings model, the effect or return of conversion to carbon.;

via management agreement;

exchange of land (farmer-vegetable grower) x ? / ha. include crop in rotation seasonal lease is a big threshold here (adjust lease law), if a farmer is allowed to use the same land continuously, he will take much more care of it ?;

Every two or three years analysis of soil take per parcel or mixed samples from multiple parcels.;

maintenance of agroforestry with lower floor of which pruning goes into the ground after chopping. or serves to make compost with graze of erosion grass strips. Maintains and reimburses disposal.;

Preservation of pasture Encourage the use of farmyard manure;

Payment for rest crops, crop rotations, green manure fertilizers, ... See proposals for new CAP.;

Amount per quantity stored.;

belbeef: give audit firms (via proxy) access to data on collection request and rotational figures +% calculate 'roughage' meat (from own 'country', everything except purchased concentrates and by-products), work out points system based on this, link these points to 'sustainability score' meat;

Doing this pays for itself;

extra subsidy for farmers who do no till;

Encourage crop rotation and use of manure;

management agreements?;

Increased hectares of premium for historically permanent grassland. Because it is scientifically proven that such soils capture a lot of CO<sub>2</sub> and contribute to biodiversity. Yet these lands are no longer profitable as they are used now. Anyone with such meadows wants to plow it as quickly as possible with all the carbon emissions consequences.;

**9 Do you know techniques farmers can use to increase the carbon in their soils?;**

**9a If yes, please give some examples**

intercropping, holistic grazing (praktiserer selv);

biocoal;

**Thuenen/3N;**

compost, cover crops, winter greening, afforestation;

corn maize??;

Building of humus-storage for CO<sub>2</sub>;

preservation of the permanent grassland;

grassland;

conservation tillage;

adapt crop rotation;

cultivation of cover crops, humus formation;

increase the humus content, root mass and groundwater level, conservation tillage ;

milling machine in conjunction with rotten promoter;

biomass, moor, humus, building-materials, CO<sub>2</sub> balance Germany-wide;

**Inagro;**

turn to grassland, minimum tillage when applying organic fertilizer;

manure, applying CO<sub>3</sub>;

cover crops, compost, manure;

compost, manure;

cover crop, reduced tillage;

**Bionext;**

Applying compost;

Improving soils with composted manure;

Composting;



No-plowing, better rotations, import extra carbon, water management;

Crop rotation, green manure, compost etc.;

Soil management;

Increasing OM content in soils by not ploughing grassland, measures in crop rotation en fertilizing with compost;

Adding manure, compost, no or reduced- tillage, adding plant waste to the soil, crop rotation, cover crops;

**ZLTO;**

Apply compost, apply solid manure., use the right cover crop ;

Cover crops;

compost/woodchips;

right application of cover crops and crops, farmer should get more knowledge about the soil, big step: more collaboration between arable farmer and cattle farmer;

usage of Biovin. See research Austria;

**Innov;**

no turning tillage and green manure;

the cultivation and plowing of green manure superficial tillage instead of plowing;

construction of grassland non-reversible soil treatment use of compost;

less tillage, cultivation of green fertilizers, gift of organic fertilizers, more extensive rotation / fewer potatoes and beets, less tearing of grassland;

Supply carbon-rich material (eg wood chips), sow green cover, leave harvest residue on the field ?;

use of farmyard manure, permanent pasture, farm compost;

Do not plow, protein washed, organic, agroforestry;

crop rotation, use of farmyard manure, catch crops, use of compost, ..;

permanent pasture, compost administration, non-turning soil treatment;

add your own compost;

Improve the conditions regarding biodiversity. Accept more herbs among the grass. Replanting wooded banks around the meadows. Spread less fresh manure use more compost. Apply Boekasi.;

compost - Bokashi;

leave straw from grain, rapeseed, corn in the field. use compost. Use BRF or wood.;

apply digestate and compost;

fewer shifts more use of compost;

compost;

non-reversed soil treatment, compost, green cover plants;

no turning till, DI, compost, green manure, harvest residues, farmyard manure but also slurry, maintaining pH, ...;

compost fertilization, green manure, more grass, non-reversible soil tillage;

planting green fertilizer instead of leaving fields fallow;

Planting trees and hedges. Compost.;

Traditional techniques such as green cover plants, use of compost or manure, etc. But new cultivation systems such as agroforestry also offer a lot of potential (and win-win).;

influence manure and / or crop residues in the soil;

administering compost, administering animal (solid) manure, non-reversing tillage, green cover plants;

green manure;

longer use of grassland - alternating system with arable land and grassland - use of green cover;

catch crops animal (stable) manure compost grassland;

muck work shiftlessly;

catch crops, farmyard manure, harvesting crops, chopping wood, agro-forestry;

organic fertilizer No tillage Compost administer permanent pasture;

increase of organic matter (organic fertilizer, crop residues, green covers, compost, wood chips, ...);

compost;

Sowing wood edges Sowing green manure Do not plow;

**10 There are several examples for carbon offset programs and projects worldwide where people transfer money to fight climate change or to compensate emissions, e.g. promotion of energy efficient cooking stoves, renewable energy programs, afforestation projects;**

**Do you think that the effort of farmers in binding and protecting carbon in soils and plants can be valorised in merchandising agricultural or other products?;**

**NLR;**

-;

**Thuenen/3N;**

consumer awareness has yet a subordinated importance;

**10a If yes, how do you think the effort of farmers in sequestering carbon can be used in merchandising agricultural or other products?;**

**NLR;**

-;

**Thuenen/3N;**

nurse crops in rape and bean;

humus balance and nutrient balance- leaching;

special logos and seals, etc.;

climate effect of the products as overview;

describe on the products to inform the consumers;

increase the sensitivity for the agricultural products;

improve CO2 balance of transportation (clima neutral transport) and use in marketing for empowering brands, sustainability in IT;

**Inagro;**

a good evaluation system of the C analyse in het soil;

euros for added value;

obligation for applying the techniques of 9 for every one GLB;

**Bionext;**

Educating consumers: Make your meal CO2 neutral!;

Via chain concept higher price for final product for consumer;

No idea yet, have to be developed;

Via certificates like Eko Keurmerk;

Premium per unit OM content improvement;

Explaining to buyers;

More vegetation in outdoor chicken range en around the farmyard and focusing on the design of the outdoor chicken range instead of the shed;

CO2 sequestration premium;

It already happens, Demeter and Bio farmers are doing it, look at the price of these products, although this higher price is probably mainly due to strict control and administration and the risks of the entrepreneurs;

**ZLTO;**

Selling 1 or 2 CO2 star products in the column;

CO2 footprint, CO 2 sequestration rating and quality;

**Innov;**

special label for climate-friendly products;

or even better integral sustainability;

Additional price for CO2 storage (just as an additional price is now being paid for organic).;

Label;

higher price for farmers who store more CO2;

You don't have to trade it, but hand it out to other fellow farmers.;

mandatory part of specifications;

organic farming (inherently more organic soil improvement and care for the soil) with translation into higher product prices - protocol (see UK - WRAP) for agricultural practices established together with buyers (wholesale / distribution sector);

sdf;

carboncredits-story like the ALDI project in Austria;

by giving farmers a supplement per cultivated hectare of land;

Subsidy per hectare that has been sustainably adjusted against taxes on land where no efforts are made.;

Carbon credits (via CO2 compensation funds, for example, to which companies, governments, private individuals, etc.) can contribute - Additional price for product, provided that sufficient clarification is linked to this to make consumers aware of this.;

fair prices???

in the promotion of, for example, dairy or meat products - in the sustainability story surrounding these products;

label on packaging? (another one may not be right) put pasture / field sign in which you say that CO2 is retained there (= not only forests retain CO2) (e.g. 1 ha of meadow = drive CO2 of x km);

better yield, linking the cap to the C content in the soil;

by including not only the economical cost but also the ecological cost in the price calculation;

label;

Via carbon credits;

**Supplement 5** - The awareness of carbon farming in the agricultural sector, possible and used techniques and business approaches in the North Sea region. Short report of two surveys (2019 and 2021): **Carbon Farming Survey 2021 – Questionnaire from 19.11.2021**. NSR Interreg Project Carbon Farming.

### **Will you engage in Carbon Farming? Please answer our short survey!**

Soil organic matter is an important carbon pool. Its protection and enrichment will guard and enhance soil fertility under climate change and helps to reach climate goals. Sequestering carbon in soils by suitable agricultural management gives time for the development of climate-smart technologies in other sectors. In the INTERREG – North Sea Region project “Carbon Farming” we studied and supported emerging new business models for carbon removal from the atmosphere and the storage in organic matter of agricultural soils. With this short survey at the end of our project we would like to know your thoughts and activities concerning Carbon Farming in the last three years.

Thank you for your time!

**1. What is your area of activity?**

- a. Agricultural sector: primary production*
- b. Agricultural sector: as expert in advisory, politics, research, associations*
- c. Trade, distribution or processing of food or feed*
- d. Production and trade of agricultural equipment*
- e. Job not related to agriculture*

**2. Do you personally think more about carbon enrichment in soils as option for climate change mitigation today than three years back?**

*Answers: Yes/No*

**3. Have you changed your management to enrich and protect soil organic carbon on your farm in the last years?**

*Yes/No*

3.1 If yes, which measures have you introduced and 3.1.1 on how many hectares in total?

*Text answer*

3.2 If no, what is limiting you to change management and begin with carbon farming?

*Text answer*

**4. There are already initiatives for more organic matter formation in soils and CO<sub>2</sub>-certification.**

4.1 Do you know some of such initiatives?

*Answers: Yes/No*

4.2 Do you participate in such initiative?

*Answers: Yes/No*

4.3 If yes, in which one

**Supplement 6** - The awareness of carbon farming in the agricultural sector, possible and used techniques and business approaches in the North Sea region. Short report of two surveys (2019 and 2021): **Carbon Farming Survey 2021 - All answers to closed questions by regions**. NSR Interreg Project Carbon Farming.

*Institutions providing the questionnaires the regions: Norsk Landbruksrådgiving, Norway; Thünen-Institute of Organic Farming, Germany; 3N Kompetenzzentrum, Germany; Inagro, Belgium; Stichting Bionext, The Netherlands; ZLTO – Southern Agriculture and Horticulture Organization, The Netherlands; Innovatiesteunpunt, Belgium*

Survey Carbon Farming, winter 2021		All		Norway		Germany		Belgium		The Netherlands		BE+NL			
		%	n	%	n	%	n	%	n	%	n	%	n		
<b>1 In which of the following sectors do you work?</b>		<i>Answers</i>		159		55		47		41		16		57	
Agricultural sector: primary production		75	120	82	45	38	18	100	41	100	16	100	57		
Agricultural sector: as expert		20	32	13	7	53	25	0	0	0	0	0	0		
Trade, distribution or processing of food or feed		1	1	2	1	0	0	0	0	0	0	0	0		
Production and trade of agricultural equipment		2	3	0	0	6	3	0	0	0	0	0	0		
Job not related to agriculture		2	3	4	2	2	1	0	0	0	0	0	0		
<b>2 Do you personally think more about carbon enrichment in soils as option for climate change mitigation today than three years back?</b>		<i>Answers</i>		158		54		47		41		16		57	
Yes		80	127	80	43	100	39	80	33	75	12	79	45		
No		20	31	20	11	21	8	20	8	25	4	21	12		
<b>3 Have you changed your management to enrich and protect soil organic carbon on your farm in the last years?</b>		<i>Answers</i>		140		55		28		41		16		57	
Yes		74	103	78	43	93	26	59	24	63	10	60	34		
No		26	37	22	12	7	2	41	17	38	6	40	23		
<b>3.1 If yes, which measures have you introduced?</b>		<i>Answers</i>		85		26		23		24		12		36	
<i>The full text answers are given in a separate list (Supplement 7).</i>															
<b>3.1.1 If yes, on how many hectares in total?</b>		<i>Answers</i>		82		26		16		28		12		40	
Hectares		7173		1009		4798		787		579		1366			
<b>3.2 If no, what is limiting you to change management and begin with carbon farming?</b>		<i>Answers</i>		59		25		17		13		4		17	
<i>The full text answers are given in a separate list (Supplement 7).</i>															
<b>4 There are already initiatives for more organic matter formation in soils and CO<sub>2</sub>-certification. 4.1 Do you know some of such initiatives?</b>		<i>Answers</i>		158		54		47		41		16		57	
Yes		66	105	50	27	77	36	78	32	36	10	61	42		
No		34	53	50	27	23	11	22	9	21	6	22	15		
<b>4.2 Do you participate in such initiative?</b>		<i>Answers</i>		153		54		44		40		15		55	
Yes		18	28	26	14	26	12	5	2	0	0	4	2		
No		82	125	74	40	68	32	93	38	94	15	93	53		
<b>4.2 If yes, in which one?</b>		<i>Answers</i>		31		13		14		3		1		4	
<i>The full text answers are given in a separate list (Supplement 7).</i>															

**Supplement 7** - The awareness of carbon farming in the agricultural sector, possible and used techniques and business approaches in the North Sea region. Short report of two surveys (2019 and 2021): **Carbon Farming Survey 2021 – Results of open questions by regions**. NSR Interreg Project Carbon Farming.

*Entries were translated by the project partners of the regions, some original passages were tolerated, single entries of the respondents are semicolon separated. They appear in the order of entry in the database.*

*Institutions providing the questionnaires the regions: Norsk Landbruksrådgiving, Norway; Thünen-Institute of Organic Farming, Germany; 3N Kompetenzzentrum, Germany; Inagro, Belgium; Stichting Bionext, The Netherlands; ZLTO – Southern Agriculture and Horticulture Organization, The Netherlands; Innovatiesteunpunt, Belgium*

**3. Have you changed your management to enrich and protect soil organic carbon on your farm in the last years?;**

**3.1 If yes, which measures have you introduced and on how many hectares in total?;**

**Norway;**

Converted to organic meadow – 30;

? – 50;

Composting of green and food waste – 0,1;

Direct sowing and cover crops – about 20;

Direct sowing + catch crops – 45 direct and about 10 catches per year;

Cover crops - 14,3;

Cover crops – 20;

Reduced tillage – 20;

Direct sowing and cover crops – 150;

Horticulture: little discussion about carbon sequestration. What about horticulture and "carbon farming"? – 5;

Grass cover all year round. Grazing animals (Highland cattle and hens) in small areas that are moved often – 3 with grazing animals per day. Grass cover of 9.;

Direct sowing and cover crops – On everything 13;

Produces biochar with kontiki stoves. Mixes biochar in the soil where apple trees are planted. Makes compost mixed with biochar. Planning experiments with biochar filter to catch nutrient runoff – 1;

Longer rest time on pasture crop – 4;

Direct sowing and compost – 40;

Compost, clover, stopped with pesticide and fertilizer, renewal of meadow by direct sowing. – all ca. 10;

Direct sowing and cover crops – 110;

Targeted grazing, reduced tillage – 100;

Reduced amount of tillage / none. Use of catch crops. Active crop rotation – 17;

Regenerative grazing – 7;

undersown crop – 8;

Has spread sludge of 22 ha and has spread a lot of wood chips from horses 3 ha – 25;

Crop rotation, direct sowing, cover crops – 250;

Changed grazing practices, greater awareness about tillage, surface composting, increasing the diversity of seed mixtures, stimulating increased fungal biology in soil and compost – total area, ca. 10 forestland;

Cover crops – 25;

Trying surface composting – currently about 13;

**Germany;**

SOC enrichment since 20 years (intercrops, leaving straw on field, conservation tillage etc.) – 75;

conservation tillage with minimal soil disturbance since 30 years - 200;

direct seeding – 2000;

expanded crop rotations with legumes – 1000;  
use of farmyard manure, reduced tillage – 600;  
undersown crops, mulching - some variable sized fields;  
use of wood chips, bio-coal, rock flour and effective microorganisms in the bedding of livestock, manure, composting - 20 (with manure compost);  
keep the soil green, use of microorganisms, biodiversity, mob-grazing, shallow tillage – 110;  
intercrops, mulch-seeding, compost, farmyard-manure, digestates, crop rotation, leaving harvest residues in the field – 40;  
compost application, intercrops – 400;  
compost, intercrops, farmyard manure – 1200;  
intercrops, no ploughing - 110+250;  
no ploughing, undersown crops, grass, intercrops – 170;  
intercrops, reduced soil tillage – 35;  
establishment of a Sphagnum farm (paludiculture) – 1;  
intercrops, leaving straw on the field - 33+30;  
1. intercrops for humus formation (12 ha), 2. silvoarable System (2 ha) – 14; -  
use of bio-char and digestates – 2;  
intercrops, personal training and information, reading books – 5;  
green manuring, intercrops, straw and maize straw incorporation – 50;  
some arable fields are used as permanent grassland – 6;  
mulch-seeding, use of bacteria to activate the soil/root/plant systems, reduce soil cultivation in total, use of site-specific fertilisation – 440;  
conservation tillage – 340;

#### **Belgium;**

Non-inversion tillage and green manure - 15  
eagmengses (?) – 15;  
as much farmyard manure and cover crops as possible and minimal tillage (non-turning if possible) - on all hectares where possible;  
green cover crops and manure – 12;  
sowing grass after main crop - 12;  
sowing green cover crops - 25;  
Use compost – 20;  
more green manufacturer – 20;  
no more deep tillage, chopping straw, sowing green manures,... – 116;  
Compost - 1,5;  
straw is chopped by pick thresher and remains on the field – 10;  
? – 4;  
? – 25;  
more farm manure/ different green fertilization – 14;  
? – 23;  
Use of compost, no more straw but chopped – 15;  
as much ground cover as possible – 22;  
less processing - 16;  
manure – 5;  
more green cover crops – 3;  
? – 100  
Using more manure and compost - As much as possible, within fertilization standard  
more offspring – 20;  
sow more green cover crops than before and sow grains without plough – 15;  
ploughless farming, undersown crops in maize – 150;  
only farmyard manure, permanent grasslands – 16;  
More green cover – 20;  
We stopped ploughing 10 years ago – 130;

#### **The Netherlands;**



I've been doing this for 12 years – 2;  
Supply of forest land for non-inversion tillage – 20;  
compost, superficial tillage – 25;  
Herb-rich grassland and no fertilizer – 30;  
NKG and more green manures – 280;  
solid straw-rich farmyard manure, green compost, NKG, green manures over the winter. – 80;  
compost and green manures – 100;  
the use of green manures and the use of compost – 11;  
started with herb-rich grassland on a few plots – 6;  
more green manure and compost – 15;  
Leave more and more diverse greenery. Let the soil itself break down all plant remains in the natural way - 1,5;  
Good barn manure enriched with EM bacteria – 9;

### **3.2 If no, what is limiting you to change management and begin with carbon farming?;**

#### **Norway;**

that's nonsense;  
Took over farm with lands in very poor condition. Have had to change all fields to increase the quality of the meadow, but hope in the long run to be able to operate without ploughing.;  
Rents out the land, not ready to start farming yet.;  
ignorance and extra work;  
already have partly (?) such practice;  
Has long-term meadow (very long repeat breeding) with small areas with underseed and inland grassland;  
knowledge;  
need to learn more about it;  
There is talk in "large airy views" about how great it is with carbon farming, but I lack very specific advice on how to achieve this in practice with the equipment that I have available. Advice at farm level is necessary to be able to implement this.;  
Knowledge of methods in grassland farming;  
Concrete knowledge / cultivation strategies;  
no belief in this;  
Have no knowledge of this.;  
know too little about it;  
With pure/only feed production, I do not think there is so much more to do than to have the best possible plant culture.;  
Take on the big challenges first;  
Competence;  
More knowledge;  
no farm;  
Have had cover crops and meadows in circulation for 15 years;  
Knowledge;  
Extra work. The soil already has a high content of carbon.;  
Started three years ago.;  
do not know not enough;  
Has done carbon farming for many years, it is only the word that is new.;

#### **Germany;**

conservation tillage with minimal soil disturbance since 30 years ;  
I only have low-input grassland;  
I already reached a personal goal three years ago, changing arable land to flowering areas;  
C sequestration to meet climate protection targets on mineral arable soils in Germany is not promising and, depending on the soil management, is also highly and quickly reversible. Humus build-up in the sense of increasing soil fertility through undersowing, catch crops, adapted crop rotations, etc. makes a lot of sense, but that is really nothing new. Therefore, in my opinion, the term "carbon farming" should not be used to raise false expectations in civil society about the potential of such measures in terms of climate protection.;  
no farm;

no farm;  
no farm;  
no farm;  
costs;  
no farm;

"What do you mean by carbon farming"? 2. This question means that I have only been working with carbon for the last 3 years! I have been doing it for more than 20 years. 3) I am annoyed that we are offered absolutely too little money, which eats up the costs of this management. The EU agricultural policy with its insane regulations and penalties and the price dumping policy with the unequal distortions of competition hardly allows us a proper management in the sense of humus preservation.;

I am convinced that those who talk the most and point the finger at agriculture have little idea of the needs of the soil cultures, or act in the interests of capital or other sectors. The definition of humus should be clarified in general, what is meant by it.;

The other possible causes of so-called global warming should also be discussed publicly. It looks like those who do not have a proper niche or sufficient resources will soon have to give up their business!";

no farm;

Not sufficiently engaged with it. Solution approaches not sufficiently known.;

I don't know what that is. I take care of building up humus.;

no farm;

#### **Belgium;**

ignorance;

Too much work;

Too little info/knowledge;

clearer information about this and possibly guidance;

I haven't read enough info about it yet;

cost price;

Efficiency;

because the parties involved will calculate correctly how to achieve maximum returns with minimal input (money) at the expense of farmers;

N/A;

Good question why?? Don't know yourself;

flexibility;

The cost;

Knowledge;

#### **The Netherlands;**

Don't know the possibilities and opportunities;

I haven't really looked into it yet;

nothing I've been doing this for a long time;

financially too little against;

#### **4.2 Do you participate in such initiative? 4.2.1. If yes, in which one?;**

##### **Norway;**

Carbon farming etc.;

knows no one;

Has been on a course / info evening in NLR;

Conservation Agriculture;

Is probably involved in something directed by NLRØ. Not quite remember ;

Cultivation network for Conservation Agriculture;

Own project;

Carbon capture in Vossa agriculture;

COURSE arranged by NLR;

Carbon agro, mentoring scheme, group council;

Carbon sequestration in mountain agriculture;

Carbon farming via NLRØ;

Anders Næss;

**Germany;**

Klim.;

Indigo, boben op, Kaindorf, u.a.:

Most sensible are: peatland futures, afforestation, arable to grassland;

bobenop in Schleswig-Holstein; Ökoregion Kaindorf/AT;

Boben op;

Carbo Agrar (ATR);

Carbo Agrar (ATR);

Carbo Agrar (ATR);

Carbo Agrar (ATR);

Carbo Agrar (ATR);

Carbo Agrar (ATR);

Carbo Agrar (ATR), Kaindorf, boben op;...;

Carbo Agrar (ATR);

Gesellschaft für konservierende Bodenbearbeitung (GKB);

**Belgium;**

Claire;

advice in the press and agricultural research;

follow agricultural research;

via Flemish Hoeverund but is still under construction;

**The Netherlands;**

I think there is far too little to earn per ha - the power of the large numbers and therefore large companies will apply again;