



Workshop on OSCAR study

Midi-Pyrénées case study

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- **Hotspots**
- **Methodology**
- **Ariege valley hotspot**
 - Assessment of FERTI_01 unitary commitment
- **Segala hotspot**
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French case study hotspots

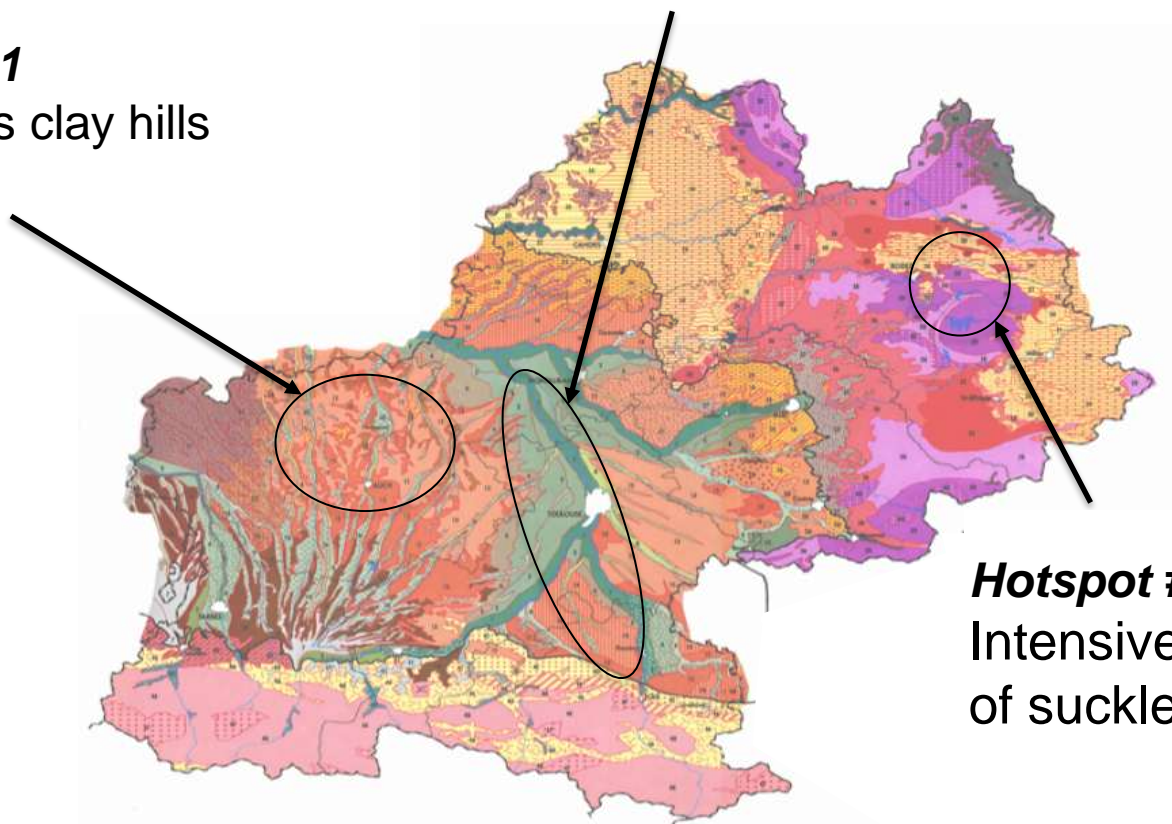


Hotspot #2

Loamy valleys along the Garonne and Ariège river

Hotspot #1

Calcareous clay hills



Hotspot #3

Intensive breeding of suckler calves

1. Identification of the environmental issues
 2. Set scopes of improvement
 3. Listing candidate operations applying to the environmental issues
 4. Selection of 3 operations to assess
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1. Concerning each of the 3 selected operations:
 1. Operation description and requirements for implementation
 2. Setting the assessed scenario
 3. Cost and profit per ha
 4. Impact on ecosystem services
 5. Practicality assessment
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1. Overall assessment
 1. Productivity assessment
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The Ariège valley



- Loamy valleys along the main rivers Garonne, Ariège and Tarn rivers
- Soils are flat and easy to cultivate and irrigate

- Continuous monoculture of maize, with no sequential cropping,
- SOC is low and N supply is very high,
- Shortage of water during the summer,
- Water pollution with nitrates and pesticides,
- Soil compaction with heavy machinery.





Step 1: Identification of the main environmental issues and concerned environmental services

→ Linked to impacts of the maize monoculture

Impacts associated with maize monoculture	Impact category	Environmental services
High consumption of water	Natural resource depletion	Provision of water for crops
High consumption of N fertilizers		Provision of fossil fuels
Exhaustion of soil fertility		Provision of soil for crop
Favouring pests and weeds associated with maize	Biodiversity	Biological regulation of crop pest and species
Nitrate leaching (Long fallow period between two crops)	Human health Ecosystem health	Provision of drinking water for human consumption
Frequent Herbicide use		

Environmental impacts of the maize monoculture

The Ariège valley

Ariège valley

Step 2: Identification of the RDP operations corresponding to the environmental issues of the MP alluvial valleys (Locally available operations)

Environmental issues	French RDP operations	OSCAR DATABASE RDP categories
High water consumption	<p>Financial and infrastructure support (Axis 1)</p> <ul style="list-style-type: none"> 121-B : « Plan végétal environnement » 125-B: Hill reservoirs for alternative source of irrigation water 125-C1: Modernization of irrigation networks <p>Land management (Axis 2)</p> <ul style="list-style-type: none"> 214-I2: Agro-environmental scheme related to the EU Water Framework Directive <ul style="list-style-type: none"> Reducing irrigation for arable crops and market garden crops (Unitary commitment: IRRIG_02) 	<p>Financial and infrastructure support</p> <ul style="list-style-type: none"> Improving water efficiency and irrigation technologies Improvement of existing irrigation and drainage networks <p>Service provision: water supply improvements</p> <p>Land management</p> <ul style="list-style-type: none"> Investments to improve the water balance Measures to promote innovation in irrigation techniques <p>Enhancement of water management</p>
Nitrate leaching (Long fallow period between two crops)	<p>Financial and infrastructure support (Axis 1)</p> <ul style="list-style-type: none"> 121-B : « Plan végétal environnement » <p>Land management (Axis 2)</p> <ul style="list-style-type: none"> 214-I2: Agro-environmental scheme related to the EU Water Framework Directive <ul style="list-style-type: none"> Training on the management of crop fertilization (UC=CI-3) Reducing N supply (mineral and organic) on arable crops and market garden crops (UC=FERTI_01) Growing catch crop beyond compliance regulations (UC=COVER02) 	<p>Land management</p> <ul style="list-style-type: none"> Winter / autumn land cover; Winter cover crops Catch crops
Exhaustion of soil fertility	<p>Land management (Axis 2)</p> <ul style="list-style-type: none"> 214-B Diversification of crop rotation in arable lands 214-I2: Agro-environmental scheme related to the EU Water Framework Directive <ul style="list-style-type: none"> Growing and maintenance of a grass cover (bands or over the entire field) (UC=COVER06) Improving the covers declared as set-aside lands 	<p>Land management</p> <ul style="list-style-type: none"> Measures to encourage good practices to store carbon Greater support for more support for crop rotations / protein crops / clover and energy measure <p>Sustainable legume crops and extended use in rotations</p>
Herbicide application	<p>Financial and infrastructure support (Axis 1)</p> <ul style="list-style-type: none"> 121-B : « Plan végétal environnement » <p>Land management (Axis 2)</p> <ul style="list-style-type: none"> 214-I2: Agro-environmental scheme related to the EU Water Framework Directive <ul style="list-style-type: none"> Training on Integrated pest control (UC=CI-1) Training on the management of practices related to plant health (UC=CI2) Growing and maintenance of a grass cover (bands or over the entire field) (UC=COVER06) <p>Reduction or banning of treatments, biological control (PHYTO 01 to 06)</p>	<p>Training and education</p> <p>Organic farming</p>
Favouring pest and weed	<p>Land management (Axis 2)</p> <ul style="list-style-type: none"> 214-B Diversification of crop rotation in arable lands 214-I2: Agro-environmental scheme related to the EU Water Framework Directive <ul style="list-style-type: none"> Growing and maintenance of areas forming an ecological regulatory 	<p>Land management</p> <ul style="list-style-type: none"> Low input spring cereal to retain or re-create an arable mosaic Innovative operations to support the conservation of biodiversity Measures to protect and develop the landscapes ecological stability



Step 3: Selection of 3 unitary commitments to assess:

- **IRRIG_02**: “Reducing irrigation for arable crops and market garden crops”;
- **FERTI_01**: “Reducing N supply (mineral and organic) on arable crops and market garden crops”;
- **COVER_02**: “Growing catch crop beyond the Nitrate Directive compliance regulations”.

All 3 operations concern Axis 2 of RDR (Land management):

214-I2: Agro-environmental scheme related to the EU Water Framework Directive

Assessment of unitary commitment

FERTI_01



Ariège valley

Description and requirements for FERTI_01 implementation :

- Aims to preserve the **quality of drinking water** by reducing the overall rate of nitrogen fertilization, mineral and organic.
- Concerns the arable crops in Midi-Pyrenees but does not apply to permanent grasslands or remarkable areas.
- Reference fertilization level = 210 kg N/ha.
- With FERTI_01, total N <140 kg N/ha (max 80 kg mineral N in vulnerable zones)
- No mandatory unitary commitment associated with FERTI01
- But recommended to combine it with training sessions on the management of fertilization (CI-3), an environmental assessment at the farm scale (CI-4) and the introduction of intermediate crops (Cover_01 and Cover_02).

Assessment of unitary commitment

FERTI_01



Ariège valley

	RAIN-FED MAIZE Yield: 6 t/ha Price: 110€/ha	€/ha	MEDIUM INPUT MAIZE Yield: 8 t/ha Price: 110/t	€/ha	IRRIGATED MAIZE Yield: 11,5 t/ha Price: 110€/ha Baseline scenario	€/ha
COSTS						
Fertilization*	175 kg perlurée 46% (80 kg N)	61	12 t cattle manure (60 kg N) 170 kg Perlurée 46% (78 kg N)		300 kg 10.20.20 370 kg perlurée 46% (200 kg N)	216 133
Seed	60,000 seeds		60,000 seeds	60	60,000 seeds	185
Herbicide	Pre-emergence Duagold (1.7l)	68	Pre-emergence Duagold (1.7l) + Metarex (0.5l)	85	Pre-emergence Duagold (1.7l) Post-emergence Callisto+banvel (0.5l)	68 52
Slug killer	Metarex 6 kg	20	Metarex 6 kg	20	Metarex 6 kg	20
Irrigation			6 applications 25 mm	103	11 applications 25 mm	188
Harvester	1 hour/ha	107	1 hour/ha	83	1 hour/ha	107
TOTAL		396		513		969
REVENUE						
CAP direct		74		120		120
FERTI management		207		137		137
Production sales		660		880		1,265
TOTAL		941		1,137		1,385
GROSS MARGIN		545		624		411

Strongly depends on the maize price and yield, and on the price of oil that affects nitrogen fertilizer.

More interesting gross margin compared to the baseline irrigated maize scenario.



Practicality assessment

- Direct impact on the maize **yield**, which generally remains the **major driver of farming practices**.
- FERTI01 is not likely to be largely adopted, unless there is a severe drop for maize price or a drastic price increase for irrigation water and oil, which directly affects fuel and fertilizer.
- This commitment can rather interest livestock farms. In the later case, the potential area is significant: in Midi-Pyrenees, manure is spread on 17% of area cultivated with maize grain and probably on the majority of maize field cultivated for silage .

Overall assessment



Ariège valley

Productivity assessment

Scenarios and associated RDP measures	Irrigated maize area in Midi-Pyrenees (ha)	Uptake (%)	Marginal yield (t/ha)	Difference in production (t)	Relative to total maize production (%)	
					of Midi-Pyrenees	of France
Rain-fed sorghum (IRRIG_02)	126,051	15	11.5	-217,438	-13.7	-1.4
Rain-fed maize (IRRIG_02, FERTI_01)		15	5.5	-103,992	-6.6	-0.7
medium input maize (FERTI_01)		15	3.5	-66,177	-4.2	-0.4
Catch crop (COVER_02)		15	0	0	0.0	0.0

Impact of the selected RDP operation on maize production in hotspot, Midi-Pyrenees and France

Overall assessment



Ariège valley

Normative assessment

Summarizes the relative scores of the 3 studied unitary commitments with respects to GES mitigation, provision of ecosystem services and practicality (including the risk on crop yield)

IMPACT CATEGORY	IRRIG_02		FERTI_01	COUVER_02
	Rain-fed sorghum	Rain-fed maize	Medium input maize	Catch crop
GES MITIGATION	+	++	+	+
RESOURCE CONSUMPTION	++	+++	+	-
WATER QUALITY	+	++	+	+
LOCAL BIODIVERSITY	+	~	~	+
PRACTICALITY	+	+	++	-
• GROSS MARGIN	+	++	+	+
• RISK ON CROP YIELD	+	--	+	-
PRODUCTIVITY	---	--	-	

Qualitative assessment of the selected unitary commitment according to the MAAP criteria

Segala



- Hills and plateaux of medium height (400-800m)
- Acidic sandy loam, easy to cultivate
- Temperate climate (rainfall 800-1000 mm/y)
- ¼ agricultural area permanent grasslands.
- Density of farm is rather high
- Access to land ownership is difficult and expensive

- Production of suckler calves: intensive livestock production with quality label
- Land is occupied with grassland, about 40%, maize for silage 20%
- Limited erosion: slopes covered with wood, but this tends to change with the conversion of grassland to arable lands
- Environmental issues : those of intensive breeding (local N pollution, CH4 emissions)





Step 1: Identification of the main environmental issues:
→ Linked to impacts of intensive breeding

Impact associated with intensive breeding	Impact category	Environmental service
Manure management	Human health Ecosystem health	Provision of drinking water for human consumption
High energy consumption	Natural resources depletion Climate Change	Provision of fossil fuels
Intensive use of arable land and grassland	Natural resources depletion Biodiversity	Provision of soil for agricultural production

Ancillary effect and environmental burdens associated with intensive livestock production

Step 2: Identification of the RDP operations corresponding to the environmental issues of the Segala region



Step 3: Selection of 3 operations to assess:

- **121-C1: Support to energy saving investments (PPE)**
 - Operation = Forage solar dryer
- **214-C: Low inputs forage systems (SFEI)**
- **214-A: Agro environmental grass premium (PHAE 2)**

121-C1: Support to energy saving investments (PPE)

Ségala

Description and requirements of 121-C1 Operation

- Listed among the National RDP 2007-2013 in Axis 1 concerning the improvement of the competitiveness of agriculture and forestry.
- Improve energy efficiency of farm systems and promote renewable energies. → limit agriculture's contribution to GHG emission through increased energy efficiency.
- ESI consists in
 - identifying possible improvements (energy savings, changes in agricultural practices) and capacities to produce renewable energy,
 - encouraging practices to reduce fuel consumption (tractors, efficient driving) and
 - promoting equipment with lower energy consumption.
- Investments that can be funded include:
 - Energy saving equipment (buildings insulation, equipment to cool the milk, heat recovery, heat exchangers...)
 - Renewable energy equipment (solar water heater, solar drying of fodder, biomass boilers, heat pumps...)
 - Test benches for tractors: controlling and adjusting the setting of agricultural machines could significantly reduce oil consumption.
 - Biogas plants using livestock manure.
- 5-year period. Payments amount to **40% of the total investment** with a maximum of 16,000 € which includes the realization of an energy assessment of the farm.

- Segala farms have been relatively intensified.
- silage maize in a short crop rotation.
- Energy consumption of the Segala farms is mainly due to concentrate feeds, fuel and fertilizers .
- Improvement of the forage nutritional quality would allow to reduce the amount of concentrate feed, notably soybean meal. The reduction of the part of silage maize, which requires high nitrogen inputs, would also help to lessen energy consumption.

→ Implementation of a forage solar dryer

- Scenario = converting area for silage maize to alfalfa (legume with the highest protein content) and stopping the purchase of soybean meal.
- The consecutive loss of feed quantity would result in a reduction of 6 LU.

121-C1: Energy saving investments

Ségala

Implementation of a solar forage dryer on a typical Segala farm

	SPECIALIZED SYSTEM IN AVEYRON AND SEGALA CALVES <i>(Baseline scenario)</i>	IMPLEMENTATION OF A SOLAR FORAGE DRYER
Livestock	58 suckling cows 75 Livestock unit	53 suckling cows 69 Livestock unit
AWU	1.5 Annual work unit	1.5 Annual work unit
Cropland	46 ha of agricultural area <ul style="list-style-type: none"> • 39 ha forage culture <ul style="list-style-type: none"> ○ 5 ha maize ○ 22 ha of temporary grassland ○ 12 ha of permanent grassland • 7 ha cereals (wheat & barley) 	46 ha of agricultural area <ul style="list-style-type: none"> • 39 ha forage crop <ul style="list-style-type: none"> ○ 27 ha of temporary grassland ○ 6 ha of permanent grassland • 7 ha cereals (wheat & barley)
Feedstuff	745 kg /LU <ul style="list-style-type: none"> • 41,6 t auto-consumed cereals • 4,1 fattening concentrates • 8,1 t soybean cake • 2,1 t vitamin-minerals 	637 kg/LU <ul style="list-style-type: none"> • 41,6 t auto-consumed cereals • 4,1 fattening concentrates • 0 t soybean cake • 2,1 t vitamin-minerals
Silage maize	5 ha 60 unit N /ha 35 T/ha organic N =210 unit/ha	0
Alfalfa	0 ha	5 ha 0 unit of organic or mineral N
Grazing area	34 ha	34 ha
Grass silage	8 ha	0 ha
Hay	17 ha	34 ha

121-C1: Energy saving investments

Ségala

Compared to the baseline scenario, the solar dryer scenario leads to a light loss per hectare and a light profit per LU

If energy prices keep increasing, the solar dryer scenario will become all the more interesting

	Specialized system in Aveyron and Segala calves (baseline scenario)		Implementation of a solar forage dryer	
	€/ha	€/livestock unit	€/ha	€/livestock unit
COSTS				
Animals expenses	535	328	458	282
Concentrates	264	162	210	129
Breeding charges	77	47	77	43
Veterinary expenses	70	43	64	40
Straw purchases	102	63	94	58
Various animals	21	13	19	12
Forage surfaces	139	86	126	77
Fertilizers and amendments	70	43	64	39
Seeds and pesticides	47	29	40	25
Various on forage	22	14	22	14
Cereal area	58	36	58	36
Fertilizers and amendments	27	16	27	16
Seeds and pesticides	32	19	32	19
Structural costs	655	401	611	395
Incl. fuel	72	44	61	38
TOTAL COSTS	1388	851	1267	677
REVENUES				
Meat from cattle herd	1419	870	1305	800
CAP 1rst pillar payments	652	400	600	368
RDP payments (LFA)	161	99	161	99
TOTAL REVENUES	2232	1369	2066	1267
GROSS MARGIN	844	518	799	591

121-C1: Energy saving investments

Ségala

Costs and payments for the installation of a solar forage dryer

	AMOUNT	AIM
INVESTMENTS		
Adaptation of the building's inside	5,000 – 15,000 €	partition walls of the cells, distribution ducts, grating. Purchase of materials and self-construction.
Handling in building = claw	20,000 €	Buy a claw telescopic arm, with rails.
Loose hay handling and transport from fields	10,000 – 50,000 € depending on capacity	Loader wagon
Fan(s), power supply and connections	3,000 – 10,000 € (depending on the number of fans)	Do not forget the cost of the electrical connection of the fan and claw from the electricity meter. See if need to change the current rate and electricity meter.
Hot air generator – solar panel	10,000 – 30,000 € depending on building size	Installation of insulation panels for solar air on building
New building	?	
Energy diagnosis of the farm	1,000 €	Required to qualify for support
PAYMENTS		
Eligible amount of investment for ESI payments	40,000 €	
Amount of payments	40 %	
Maximum amount of payments	16,000 €	

Impact on ecosystem services

Several positive impacts on the environment, by its global action on cattle feeding:

- **Avoidance of non renewable resources use:**
 - Silage maize (high N requirements) replaced by alfalfa, a pluri-annual legume that needs less inputs and field operations
 - Distribution of feed to animals done by hydraulic claw (reduction of fuel for tractors)
 - Purchases of soybean meal is no longer necessary (environmental impacts relative to soybean production, transformation and transport are avoided)
 - Less field operations on grassland due to loose harvest (reduction of fuel for tractors)
- **Avoidance of GHG emissions:**
 - Reduction of CO₂ emissions due to fuel and energy savings
 - Reduction of field N₂O emissions due to the high maize fertilization
- **Provision of water of good quality** is ensured by replacing maize which entails high risk of nitrogen field losses, with legumes.

Practicality analysis

- Several consequences on the overall strategy of the farm.
- More grazier system.
- high protein content of the alfalfa allows to avoid protein supplement such as soybean meal.
- cattle feed less dependent on external purchases which prices are fluctuating, and to benefit from the complementarity between the crooping and breeding systems.
- A period of transition and adaptation may be necessary, however, to overreach the level of initial economic balance.

121-C1: Energy saving investments

Ségala

Incentives and limitations for the implementation of the 121-C1 measure

	INCENTIVES	LIMITATIONS
121-C1 measure “Support energy savings investments”	<ul style="list-style-type: none">• Each NUTS 2 region sets priorities on production that should be supported• In Midi-Pyrenees, Cattle farms (including dairy farm) are particularly supported	<ul style="list-style-type: none">• Only every 5 years• Payment limited to 16,000 €/farmer: in many cases, it does not cover all the investments (new building...)
Case of an installation forage solar dryer on farms	<ul style="list-style-type: none">• Possibility to install photovoltaic panels on the building roof at the same time• Possibility to directly dry hay bales and move them to other distribution sites• Easy distribution with hydraulic claw• Same amount of labour needs	<ul style="list-style-type: none">• Substantial investment needed• If buildings are not suitable (height, structure), need for a new one• New harvester machine needed (loader wagon)• Animals have to be fed near the building where the forage is dried, in the case of bulk drying• Training or information sessions are needed to know how to correctly run the dryer

Productivity assessment

Both scenarios associated with 121-C1 “energy saving” and 214-C”low input forage system” entail **no loss of the meat production**, while a 13% decrease of meat production is necessary in the 214-A AEGP (grass premium) scenario to comply with the maximum stocking rate of 1.4 LU/ha.

Depending on the RDP measure, **production of silage or concentrates have been drastically reduced** in the studied scenarios and partially or totally replaced by purchases. This option is questionable since it can result in a simple shifting of environmental impacts in another place and had often better be produced on farm at both economic and environmental points of view (local complementarity between crop farming and breeding).



Normative assessment

IMPACT CATEGORY	121-C1 Support to energy saving investments	214-C Low inputs forage systems	214-A Agro environmental grass premium
GES MITIGATION	+	+	++
NON RENEWABLE RESOURCE DEPLETION	+	+	+
WATER QUALITY	+	+	++
BIODIVERSITY	+	++	++
PRACTICALITY	+	++	--
• GROSS MARGIN	-	+	--
PRODUCTIVITY	+	-	--

Qualitative assessment of the selected unitary commitment according to the MAAP criteria

Gers hills



- Typical rotation:
**wheat /
sunflower/barley
/sunflower**
- Excess of N
supply



- After wheat or barley harvest in July soil is till and uncovered → erosion is a main environmental issue.
- Combined with the excessive use of N → water quality is also an issue.
- Pollination (sunflower) → adaptative capacity.

- Calcareous clay hills
- Department of Gers
- Rainfed crops
- Variable slopes (low to high)





Gers hills

Impacts associated with Gers hills cropping systems (Wheat/sunflower rotation on steep hills)	Impact category	Environmental services
Erosion, Exhaustion of soil fertility	Natural resource depletion	Provision of soil for crop
High consumption of N fertilizers		Provision of fossil fuels
Nitrate leaching (Long fallow period between two crops)	Human health Ecosystem health	Provision of drinking water for human consumption
Frequent Herbicide use	Human health Ecosystem health	Pollination, Provision of drinking water for human consumption

Environmental impacts of the Gers cropping system



Step 3: Selection of 3 operations to assess:

- **214-B: Diversifying crops succession**
- **214-I2: Agro-environmental scheme related to the EU Water Framework Directive**
 - **COVER_02:** “Growing catch crop beyond the Nitrate Directive compliance regulations”
- **214-I2: Agro-environmental scheme related to the EU Water Framework Directive**
 - **COVER_06:** Growing and maintenance of a grass cover (strips or over the entire field)



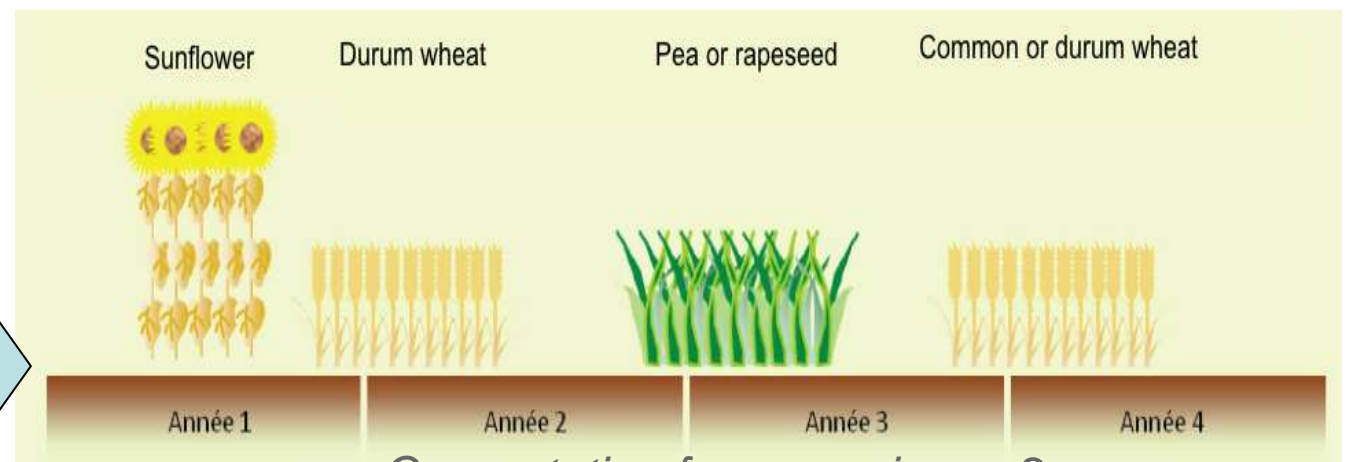
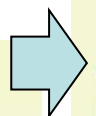
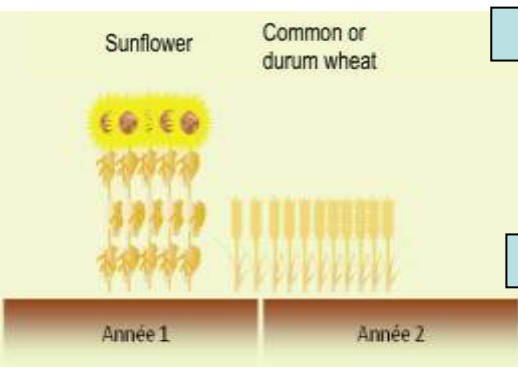
Description and requirements of the operation “Diversifying crop rotation”

- Aims to limit the use of pesticides by diversifying the habitats of agro-ecosystems. A diversified mosaic of fields also helps to impede run-off and soil erosion.
- All arable lands of the farm, including the set-aside lands, are eligible for this measure, provided that at least 70% of the farm arable area is engaged.
- The share of main crop area is limited to 50%
- Grow crops other the main three ones on more than 10% of the arable land area
- Each field is cultivated with at least three different crops on a 5-year period, without the same crop being cultivated during two consecutive year
- The payment granted for this measure amounts to 32 €/ha.

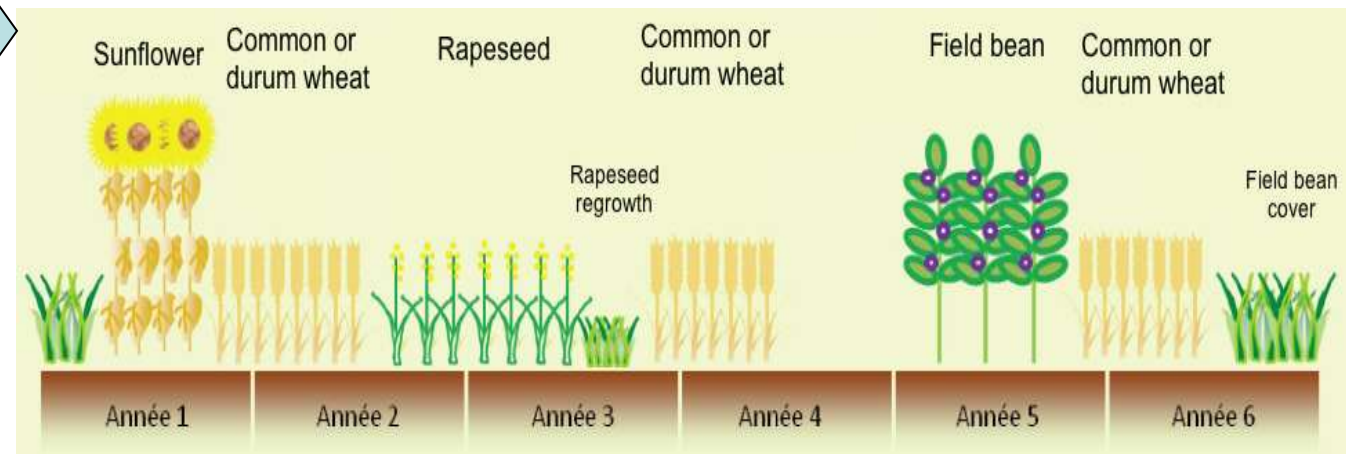
Diversifying crop rotation

Gers hills

The assessed scenarios



Crop rotation for scenario no. 2



Crop rotation for scenario no. 3

Crop rotation for the baseline scenario

Diversifying crop rotation

Gers hills


Costs and revenues per ha

	PEA	SOR-GHUM	RAPE-SEED	COMMON WHEAT	DURUM WHEAT	SUN-FLOWER	FIELD BEAN
YIELD (t/ha)	4	5.5	3.5	5	5	3	1.6
Price 2009 (€/t)	140	100	220	110	180	180	300
COSTS (€/ha)							
Fertilizer	195	237	357	233	258	230	
Seed	130	70	26	40	72	100	89
Pesticide	66	49	173	103	107	105	
Harvest	90	83	90	83	83	83	82
TOTAL COSTS	481	439	646	459	520	518	171
REVENUES (€/ha)							
CAP direct payment	120	74	74	74	74	74	132
Production sales	560	550	770	550	900	540	480
TOTAL REVENUES	680	624	844	624	974	614	612
GROSS MARGIN (€/ha)	199	185	198	165	454	96	441

Diversifying crop rotation

Gers hills

	Average gross margin (€/ha/year)	Average gross margin with the RDP measure payment (€/year/ha)
Scenario 1 (baseline scenario) Common or durum wheat/Sunflower	203	203
Scenario 2 Sunflower/Durum wheat/Pea or rapeseed/Common or durum wheat	265	296
Scenario 3 Sunflower/Common or durum wheat/Rapeseed/Common or durum wheat/Field bean/Winter or durum wheat	277	309



Estimated Average gross margin for three crop rotations

- Profitability of each crop highly depends on prices of crops (oil crops)
- For instance, the price of common wheat has drastically increased in 2009, reaching 250 €/t in September 2012, reducing the gap with the price of durum wheat, at 300€/t.
- Amount of the measure payment = 32€/ha seems limited to compete with high prices

Impact on ecosystem services

Biodiversity: the diversification of the rotation result in continuous changes in habitats that prevent the settling of crop pests and diseases.

Water quality: the natural prevention of crop pests and diseases leads to lesser needs of pesticides, and consequently lesser pollutant loads in waters.

Soil erosion: At the watershed scale, a more diversified mosaic of crops impedes soil erosion (Solagro, 2008)



Practicality assessment

- the diversification of the crops rotation appears as a win/win option for the farmer revenue and the environment.
- However, the current trend rather consists in a further simplification of crop rotation.
- The way backward is difficult as the entire agricultural sector is involved in these processes of specialization and simplification of crop rotation

In midi-Pyrenees, possible limitations that hamper the diversification of crop rotation :

- The high technical and financial requirements for some crops.
- The organization of the market chain.
- Lock-in of the agri-food industry.



Productivity assessment

Scenarios and associated RDP measures	Crop area in the Gers department (ha)		Up-take (%)	Difference in production* (t)		Relative to total Gers production (%)		Relative to total MP production (%)		
	Sun-flower	Durum wheat		Sun-flower	Durum wheat	Sun-flower	Durum wheat	Sun-flower	Durum wheat	
CROP ROTATION	88,857	27,867	15	4-year rotation	-16,661	0	-7.5	0	-2.8	0
6-year rotation				-22,214	0	-10.0	0	-3.8	0	
Catch crop			15	0	0	0	0	0		
Grass strips on 6% of the field area			15	-1 999	-1 053	-0.9	-0.9	-0.3	-0.2	

Impact of the selected RDP operation on sunflower and durum wheat production in Midi-Pyrenees

Overall assessment



Gers hills

Normative assessment

IMPACT CATEGORY	CROP ROTATION		COUVER_02	COUVER_02
	5-year rotation	7-year rotation	Catch crop	Grass strips
GES MITIGATION	+	+	+	+
NON RENEWABLE RESOURCE DEPLETION	++	++	-	+
WATER QUALITY	++	++	+	++
BIODIVERSITY	++	++	+	+
PRACTICALITY			-	
• GROSS MARGIN	++	+	+	-
• RISK ON CROP YIELD	++	+++	-	~
PRODUCTIVITY	~	~	~	~

Qualitative assessment of the selected unitary commitment according to the MAAP criteria



Thank you for attention