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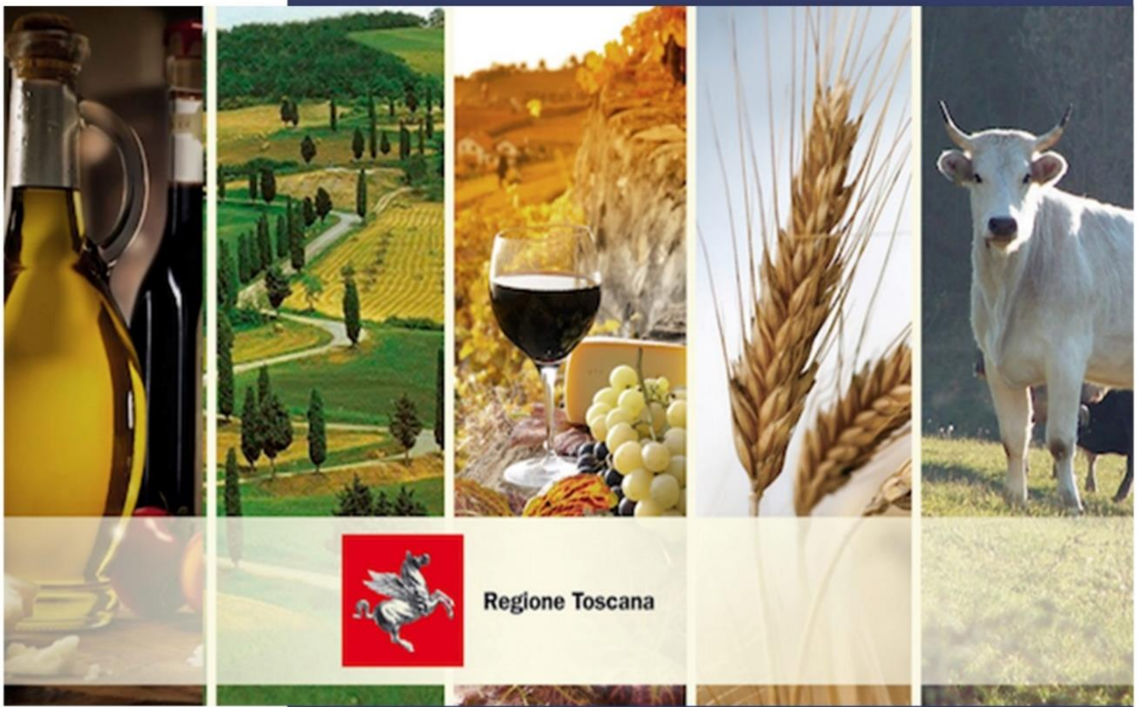


Rome,
December 2021

REGIONE TOSCANA

# EVALUATION OF THE RURAL DEVELOPMENT PROGRAMME 2014-2020

## Comparison of the PLV of the farms participating in Measure 11 organic productions and submeasure 10.1.1 - commitment of sod seeding - with respect to conventional productions through the estimation of the yields obtained with a specific model based on satellite images

**Thematic Evaluation Report C2.2: Analysis and Judgement**
**Technical Synthesis**

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## LIST OF ACRONYMS

**MA**: Managing Authority

**ARTEA**: Tuscan Regional Agency for Agricultural GrantsAT: Technical assistance

**CAWI**: Computer Assisted Web InterviewingEC: European Commission

**ET**: EvapotranspirationFA: Focus Area

**EAFRD**: European Agricultural Fund for Rural DevelopmentFG: Focus groups

**GHG**: Greenhouse Gases

**ISMEA**: Institute of services for the agricultural food marketKc: Cultural coefficient

**CAP**: common agricultural policyPEC Certified Electronic Mail GSP: Gross saleable production

**RDP**: Rural Development ProgrammeRoW: Measure Manager

**RT**: Tuscany Region

**SEBAL**: Soil Energy Balance Algorithm for LandEU: European Union

**VI**: Independent Evaluator

## Foreword

The aim of the thematic study is to estimate the differences in the profitability of some herbaceous crops grown organically and with conservative farming techniques (sowing on the sod) and the same crops grown with conventional methods.

From the discussion with the regional referents, carried out through several operational meetings, it clearly emerged the strong attention paid by RT to verify how the application of organic farming techniques and sowing on grassland affect the incomes of farms. In particular, the need to verify the extent to which the application of these techniques has an impact on the cultivation practice of the companies, on the yields obtained and on the selling prices of products.

The definition of yields and prices has allowed a comparison between the GSP obtained by farms using organic production methods/field sowing and that obtained by conventional farms in order to verify the degree of economic sustainability of environmentally friendly production. This element may be useful in defining the amount of aid to be paid to organic farms in the next programming period.

All this also considering that, according to what is reported in the draft documents for the next programming period, the premium granted to beneficiaries may also reward the environmental benefits that the environmentally friendly production system determines. In fact, as stated in art. 70 par. 5 of Reg. 2021/2115: *Member States may promote and support collective schemes and payment schemes based on results to encourage farmers or other beneficiaries to produce a significant improvement in the quality of the environment on a larger scale or in a measurable way.*

In order to identify the study area, an area characterized by the consistent presence of plots of land cultivated with organic farming techniques and with conservative farming techniques (no tillage) was searched for. The analysis of the monitoring data provided by ARTEA identified the study area in Val d'Orcia. The crops under investigation are durum wheat, soft wheat, alfalfa, oats, grassland, broad beans and clover.

## 1. Estimation of the yield differential on plots conducted with organic method and no tillage compared to plots conducted with conventional technique

A pairwise comparison was carried out between 22 plots conducted with the organic method or with the technique of sowing on the sod and the respective 22 counterfactual plots conducted with the conventional technique. Subsequently, the estimates were validated through the company interviews, and then an overall territorial analysis was carried out, which concerned all the companies benefiting from commitments linked to organic farming, compared with all the plots conducted in a conventional manner falling within the study area. The territorial analysis was carried out only for organic farming, since all the "no tillage" plots had already been analysed with the pairwise comparison.

The surface area analysed in the pairwise comparison was 454 hectares in total, of which 133 hectares were organic (maintenance), 53 hectares were used for conservation agriculture (no tillage), 37 hectares were organic (introduction) and 231 hectares were farmed conventionally.

In the comparison between the different cultivation techniques it emerges that the yield of organic in conversion is always lower than conventional with values ranging from -19% for alfalfa to -56% for broad bean and intermediate values for grass (-29%) and soft wheat (-49%); organic maintenance is lower than conventional for the two types of wheat (-33% for durum and -54% for soft wheat) and for broad bean (-39%), it is in line with alfalfa (-2%) and is higher than conventional for grass and clover (15% and 35% respectively); conservation agriculture always has higher yields than conventional (from 22% for durum wheat to 156% for clover and 79% for grass) with the exception of oats where the yield is 19% lower than conventional.

These results show that organic in conversion never reaches the yields of conventional even for fodder crops, organic maintenance obtains yields for fodder crops higher or in line with conventional while for wheat and broad beans the yield is lower than conventional, conservation agriculture is always higher than conventional except for oats.

In the territorial analysis all the plots present in the study area (Municipality of Val d'Orcia) were considered, aggregating all the organic (introduction and maintenance) all the wheat (hard and soft) and grasslands together with clover. The analysis was carried out exclusively as a comparison between organic and conventional, involving 626 hectares of organic and 2261 hectares of conventional. The comparison of yields shows that organic is always lower than conventional, in particular alfalfa is -20% lower, grassland has a slightly lower yield (-7%) and wheat shows the most marked difference of -32%.

**Table 1 - Comparison of average yield of spatial analysis by crop and cultivation technique**

| Crops | Organic | Conventional | Diff multi |
|---|---|---|---|
| | (Kg s.s. /ha) | | (%) |
| Alfalfa | 4.663 | 5.846 | -20,24 |
| Grassland* | 4.552 | 4.904 | -7,18 |
| Wheat | 3.972 | 5.868 | -32,31 |

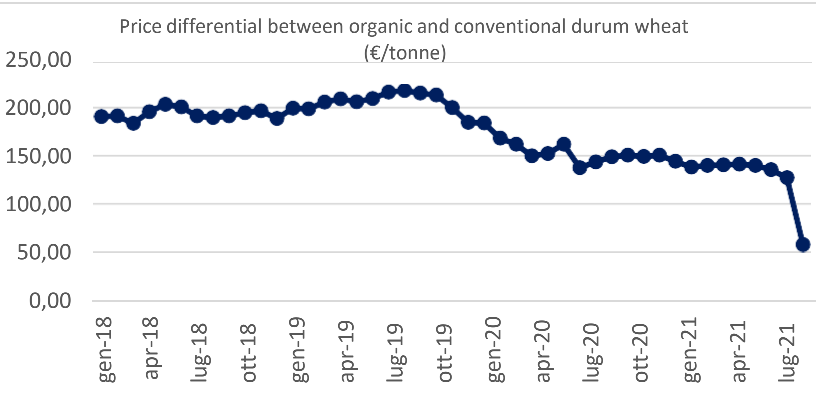
* Grassland including clovers

## 2. Price analysis

For the analysis of price trends and for the estimate of the differential between organic and conventional production, the statistical information collected periodically by ISMEA as part of the observatory of agricultural and agri-food markets and divided by main market and product variety was processed.

Organic productions of field beans have a price regularly higher than conventional productions, in the order of 5/12 euros per 100 kg of product. This differential, expressed in terms of additional percentage of price guaranteed by the organic compared to the conventional[1], tends toreduce over time in a fairly obvious way, going from about 50% in January 2019[2] to 22% in September 2021.

Organic durum wheat prices are therefore stagnating, except for the last six months, but the differential with conventional production is still very high and always above 50% until June 2021. In the most recent year and a half, however, this differential has progressively narrowed (126 euro per tonne in August 2021, 37% of the conventional price), until it fell sharply in September 2021.




Prices of organic common wheat are generally stagnant, but the differential with conventional production is still high, although progressively decreasing.

[1] 1 Diff. % = [(P Organ - P convenz)/P convenz]*100

[2] The price data for organic production in 2018 are too incomplete to allow a reliable comparison with conventional production prices

## 3. Counterfactual analysis of the GSP obtained by the farms benefiting from measure 11 and submeasure 10.1.1 - commitment of no tillage compared to conventional farms

The analysis of GSP combines yield estimates made with the TETHYS application and analyses of price trends taken from the ISMEA database, focusing on crops for which price and quantity information is available for the various cultivation techniques considered.

The analysis is carried out first of all with reference to the prices recorded in 2019, the reference year against which the yields were estimated; secondly, the analysis is extended with reference to the prices of 2021[3], in order to investigate the most recent dynamics, which as highlighted in the previous paragraph show the progressive narrowing of the price gap detected between organic and conventional productions.

The following table gives information on production and prices and the resulting GSP, broken down by crop and cultivation technique.

**Table 2 - Production, prices and GSP by crop and cultivation technique (prices and yields year 2019)**

| Crops | Organic (maint.) | Conservative | Conventional | Organic price | Price conv* | GSP Organ | GSP Conserv | GSP Conv | Diff GSP Organ /conv | Diff GSP conser/conv |
|---|---|---|---|---|---|---|---|---|---|---|
| | (Kg s.s. /ha) | | | €/t | | €/ha | | | % | |
| Oats | | 1.802 | 2.216 | | 152,3 | | 274,4 | 337,4 | | -18,7% |
| Grassland | 4.549 | 7.091 | 3.955 | | 133,2 | | 944,5 | 526,8 | | 79,3% |
| Fava | 6.582 | | 10.808 | 387,1 | 217,5 | 1.019,2 | | 940,3 | 8,4% | |
| Durumwheat. | 3.365 | 6.089 | 4.999 | 394,0 | 187,0 | 1.325,8 | 1.138,6 | 934,8 | 41,8% | 21,8% |
| Common wheat | 2.638 | | 5.677 | 265,4 | 211,6 | 700,2 | | 1.201,0 | -41,7% | |

Oats, durum wheat and Fava beans: annual average price (2019 survey year) in Florence square Common wheat: average annual price (2019 survey year) of the Grosseto market place Grassland: national average annual price (2019, ryegrass and clover)
For field beans, a harvest index of 0,4 is applied in order to apply the only price available for organic crops, which is for the grain.

From the analysis of the most recent price trends, it is clear that the reduction of the price gap between organic and conventional production (see also par. 3) means that the overall value of conventional production, thanks to the higher yields it guarantees, remains higher than the GSP of organic production for all the crops considered.

**Table 3 - Production, prices and GMP by crop and cultivation technique (2021 prices and 2019 yields)**

| Crops | Organic (maint.) | Conservative | Conventional | Organic price | Price conv* | GSP Organ | GSP Conserv | GSP Conv | Diff GSP Organ /conv | Diff GSP conser/conv |
|---|---|---|---|---|---|---|---|---|---|---|
| | (Kg s.s. /ha) | | | €/t | | €/ha | | | % | |
| Oats | | 1.802 | 2.216 | | 165,2 | | 297,8 | 366,2 | | -18,7% |
| Grassland | 4.549 | 7.091 | 3.955 | | 123,1 | | 872,9 | 486,9 | | 79,3% |
| Fava | 6.582 | | 10.808 | 390,0 | 243,8 | 1.026,8 | | 1.054,0 | -2,6% | |
| Durumwheat. | 3.365 | 6.089 | 4.999 | 325,0 | 242,5 | 1.093,6 | 1.476,5 | 1.212,2 | -9,8% | 21,8% |
| Common wheat | 2.638 | | 5.677 | 280,0 | 243,8 | 738,6 | | 1.384,2 | -46,6% | |

Oats, Durum Wheat and Fava Wheat: average annual price (2021 first semester average) of Florence square
Common wheat: average annual price (2021 first semester) of Grosseto square
Grass: national average annual price (2021, ryegrass and clover)
For broad beans a harvest index of 0.4 is applied in order to apply the only price available for organic crops, which is relative to the grain.

As shown in the table, the differential of GSP for areas cultivated with fava beans, which with 2019 prices was positive and in favour of organic farms (+8.4%) compared to conventional ones, considering 2021 prices this differential becomes negative, with a GSP of organic farms lower than that of conventional farms by 2.6%.

Even more evident is the loss of profitability recorded for organic farms growing durum wheat for which, using the prices of the 2021 vintage, an average GSP per hectare is recorded that is 9.8% lower than conventional production, while with the 2019 price levels this ratio was reversed and in favour of organic production by over 40%.

As far as soft wheat is concerned, the substantial stagnation of selling prices does not determine particular changes between 2019 and 2021, confirming the high profitability *gap* (-46.6%) between organic and conventional farms in favour of the latter.

## 4. Results of interviews with privileged witnesses and focus groups

With regard to the **data on yields**, the experts confirmed the information collected through the processing of satellite images, highlighting some peculiarities of the results obtained on different plots. In particular:

- It is confirmed that the productions of organic farms are more contained when the farm is in the conversion phase.
- The yield limitation of organic production is linked to the possibility of distributing nitric and ammoniacal nitrogen. Even if the organic technique is correctly applied, the limiting factors related to nitrogen availability do not allow certain production levels to be exceeded.
- The presence of limited yield differentials on forage crops (clover grassland) between organic and conventional farms is justified by the fact that even conventional farms use very modest inputs on this type of crop.
- The production of the farms practising the sowing on sod was very similar to the productions obtained in the conventional farms and this is justified by the climatic trend of the season under investigation. The conservative agriculture techniques respond very well in case of water shortage in the post-sowing phase and of caryopsis enlargement, a shortage which characterized the climatic trend of the season under examination. In ordinary years the difference in yield between sowing on the hard surface and the conventional technique is around 10%.

Regarding the reasons considered at the base of the **scarce diffusion of the conservative agriculture commitments** in the Tuscan territory, the experts identified the following motivations:

- Farmers often consider only the loss of production without assessing the cost reductions due to the reduction of crop operations.
- Mentality of farmers not very open to the introduction of innovations.
- High purchase cost of machinery necessary for no tillage, not sustainableespecially for small farms.
- Reduced supply by contractors of tillage operations conducted with machines suitable for conservation agriculture.
- Difficulties in controlling weeds, especially following the ban on the use of glyphosate introduced by the Tuscan region.
- When making business decisions, farmers often do not consider the positive effects of conservation agriculture on soil fertility.
- Production obtained with conservative farming techniques does not command different prices from production obtained with conventional methods.

With respect to the issue of **price differentials** between products obtained with organic farming techniques compared to conventional production, the experts point out that:

- Over the years there has been a progressive reduction in the price range for durum wheat from 40-45% a few years ago to the current 20%.
- Conventional wheat prices are highly variable from year to year and linked to the commodity market. This fluctuation also affects organic wheat prices.
- The Italian food industry, especially after the scandal related to glyphosate residues found in wheat from abroad, is focusing on the origin of the raw material (pasta made with Italian wheat) rather than on the product made with organic raw materials.
- The growth in the supply of organic products has not been matched by an equivalent growth in consumer demand for these products, leading to a reduction in prices.

With regard to the novelty introduced by the draft regulation for the new programming period concerning the possibility that **the premium granted to beneficiaries may reward the environmental benefits** that the environmentally friendly production system brings about, it emerged from the discussion that

- In view of the reduction in the price differential between conventional and organic production, the current organic premium is no longer sufficient to provide an incentive for farms to introduce or maintain the organic technique.
- The proposal to recognize a "flat" positive externality per hectare, equal for all, seems unfair in consideration of the fact that different cultivation systems present different technical difficulties and different emission reduction values (it is not possible to put on the same level someone who does organic cultivation on a lawn and someone who does it on a specialized orchard).
- There is a problem related to the monetary quantification of the positive environmental externalities generated by the application of organic farming and conservation agriculture techniques. During the meetings the following proposals emerged in order to quantify the environmental benefit produced:
    - The possibility of using, the differences in land values between areas with a high concentration of organic farming and areas where this technique is less widespread
    - Use of statistics on tourism flows between areas with a high concentration of organic farming and areas where this technique is less widespread
    - Measurement of the lesser amount of inputs that organic or integrated farming farms use accounted for through the computerized farm notebook
- For the environmental externalities related to the reduction of GHG emissions, considering that there are several systems now tested to quantify the CO2 savings coulduse as a reference the value of the ton of CO2 equivalent traded on the European market ETS (Emissions Trading Scheme) which is currently equal to 55-56 euros per ton, but according to recent estimates (bloombergnef), the cost could exceed 100 euros in 2030.
- Through the use of accounting systems for CO2 equivalent emissions, including those based on the use of satellite imagery, the agricultural sector could gain access to the carbon credit market, a market from which the agricultural sector is currently excluded due to problems related to the accounting of emissions.
- Recognize an increased premium for those who make an "advanced" organic linked mainly to the duration of rotations and the species used in the rotation, factors that greatly increase the environmental effect.
- Recognise in the ecoschemes the payment of certification costs and leave the premium per hectare in the RDP.

## 5. Monetisation of external environmental effects

Assessing the externalities of the agricultural sector is an extremely difficult task because of the complexity of the relationships between the various environmental components and the different possible interpretations (economic, political, social, environmental, etc.) in relation to the various functions performed by the primary sector within the economic system.

On the basis of the objective difficulty of quantifying the positive externalities linked to the aspects of Organdiversity and water quality, we focused on the effects linked to the reduction of GHG emissions and the carbon sink of soils.

Positive environmental externalities could in fact be monetised through the creation of incentive mechanisms and/or a carbon credit market linked to the increasingly stringent GHG reduction targets defined through the Paris agreements and the last COP 26 in Glasgow.

The 2030 targets, forwarded by the European Union as part of the Paris Agreement, are:

- for the EU-ETS sector: 40% overall reduction compared to 2005 emissions;
- for the non-EU-ETS sector: 30% reduction compared to 2005 emissions;
- The LULUCF (Land Use, Land Use Change and Forestry) sector, which includes CO2 emissions and absorption in the management of forests, agricultural land and pastures, and land use change, provides for the "no debt" rule, i.e. the commitment to a zero carbon balance.

The Effort Sharing Regulation (842/2018/EC) refers only to emissions from non-EU-ETS sectors and divides the European -30% among the Member States, with differentiated objectives. For Italy, the Regulation envisages an emissions reduction target of -33% compared to 2005.

Currently, emissions are estimated according to the methodologies approved by the UNFCCC and IPCC and are counted by all member states by compiling the national inventory.

Agricultural sector emissions consider the following sectors:

- emissions of nitrous oxide from the soil, mainly due to the use of nitrogen fertilisers;
- methane emissions due to enteric fermentation;
- nitrous oxide and methane emissions from livestock manure management;
- non-CO $\text{emissions}_2$ related to combustion processes of agricultural residues.

In addition to these sectors of agricultural interest, there are also those contained in the LULUCF sector, which as a whole considers all aspects related to the different land uses and possible management systems for agro-forestry land.

This "watertight compartment" method of GHG accounting, one relating to the "agriculture" sector and the other to the LULUCF sector, does not allow, for example, the attribution of GHG saved due to the carbon sink in the "agriculture" sector.

Emissions from the agricultural sector accounted for in the national inventory for the Tuscany region represent 1.7% of emissions at the national level in 2017. The indicator is down 37% from 2005 to 2017, compared to a national average value of -6%.

In 2017, therefore, the Tuscany region had already achieved the emission reduction target of -33% compared to 2005, as required by the Effort Sharing Regulation (842/2018/EC), referring only to emissions from non-EU-ETS sectors.

**Table 4 - Greenhouse gas emissions from agriculture**

| REGIONS | Years | | | | | | | Variation |
|---|---|---|---|---|---|---|---|---|
| | 1990 | 1995 | 2000 | 2005 | 2010 | 2015 | 2017 | 2005-2017 |
| | | | | $tCO_{2eq}$ | | | | % |
| Tuscany | 1.164.884 | 1.135.453 | 1.007.291 | 840.510 | 651.448 | 673.648 | 525.370 | **-37%** |
| Center Italy | 4.449.719 | 4.292.611 | 3.976.480 | 3.460.220 | 2.942.898 | 2.968.886 | 2.651.305 | **-23%** |
| Italy | 35.600.991 | 35.568.395 | 34.914.386 | 32.711.683 | 30.526.615 | 29.953.418 | 30.780.397 | **-6%** |

*Source: Ispra: https://annuario.isprambiente.it/pon/basic/4*

The environmental effects linked to the reduction of greenhouse gases produced by the application of the organic cultivation method and by no tillage are schematically ascribable:

- to the increase of the organic substance in the soil (C-sink) (organic farming and sowing);
- the reduction of the use of mineral fertilizers and therefore the emission of nitrous oxide (organic farming).

The most evident effects on the reduction of greenhouse gas emissions are determined by the absorption of carbon in the soil, equal to 1.8 Mg/ha of CO for the $_{2eq}$commitment related to sowing on land and 3.51 Mg/ha of CO $_{2\ eq}$for the application of the organic technique.

**Table 5 - Annual reduction of GHG- nitrogen oxide and C-sink emissions in agricultural soils in the Tuscany region**

| Commitment | Emissions reduction | | | Carbon sink in soils | Total emission reductions + removals |
|---|---|---|---|---|---|
| | Reduction of mineral nitrogen inputs | Reduction $N_2O$ | Reduction inCO $_{2eq}$ | Reduction inCO $_{2eq}$ | CO $_{2eq}$ |
| | Mg/ha | | | | |
| Sod Seeding | | | | 1,80 | 1,80 |
| Organic farming | 0,01 | 0,0001 | 0,03 | 3,51 | 3,54 |

Currently, there are two schemes for the agricultural sector that provide incentives to reduce emissions:

- the White Certificates market, in which farms can participate as voluntary entities;
- the carbon credit system, based on a voluntary market.

However, the use of such schemes to incentivise farmers to apply environmentally sound management techniques is still unattractive to them, due to:

- modest price levels recognised for tonnes of CO2 in the voluntary market system;
- difficulty of access for farms;
- possibility of introducing into the white certificate system only energy savings and not soil sinks.

One of the possible alternatives is the creation of a system of incentives linked to the achievement of emission reduction targets for the agricultural sector (-30% to 2030), which wouldalso be useful to stimulate a country system in Italy that recorded a reduction of just 6% in the period2017/2005. It would be, in essence, to establish a compensation mechanism at the national level,through which the State could use the credits generated by the agricultural sector to achieve the objectives to 2030. This is provided that the offsetting possibilities between the LULUCF sector andthe no-ETS sector become more substantial and that an accounting model consistent with the one ISPRA is developing for estimating changes in organic carbon content in agricultural soils and pastures is created.

Considering what has emerged from the estimate of the reduction of CO2 emissions achieved through the application of ISPRA coefficients and the price of CO2 on the European ETS market (currently equal to 55-56 euros per tonne, but according to recent estimates it could exceed 100 euros per tonne in 2030), a value of CO2 between 50 and 60 euros per tonne can be considered reasonable and incentive for farms.

These values would therefore make it convenient for companies to adopt virtuous agricultural practices as, considering the range of estimated CO2 savings, incentives would be obtained ranging from about 100 €/ha for sowing on hard to 200 €/ha for organic farming.

A further scenario concerns the identification of a payment scheme based on results, as provided for in Article 70, paragraph 5, of EU Regulation 2115/2021[3]. This aid scheme should provide for the recognition of a positive environmental externality linked to the reduction of GHG emissions and quantified through the value of the ton of CO2. On the basis of the results of the above analysis, the quantification of the value of the tonne of CO2 saved determines an incentive that varies from 100 €/ha for sowing on grass to 200 €/ha for organic farming.

## 6. The answer to the evaluation questions

| Evaluation questions | Judgement criterion | Summary answer evaluation question per criterion |
|---|---|---|
| **What is the difference of GSP between the farms that adhere to Measure 11 and the farms that practice conventional agriculture?** | Yield difference between farms using organic farming techniques and conventional farms | The yield differential between organic and conventional production obtained from the territorial analysis shows yield values for organic always lower than conventional but with marginal differences for grassland, more evident for alfalfa and even more relevant for wheat. |
| | Price difference between products marketed under the organic label and conventional products | The price differential between organic and conventional production remains high on the whole but shows a decreasing trend, especially for durum wheat. |
| | GSP difference between farms using organic farming techniques and conventional farms | With the exception of soft wheat, the GSP obtained by organic farms is always higher than that of conventional farms thanks to a price gap recorded in 2019 that compensates for the lower yield. The narrowing of this price gap in 2021 determines for all the organic productions analysed a lower productivity than the conventional one. |
| **What is the difference in GSP between the farms that adhere to the operation 10.1.1 compared to farms that practice conventional agriculture** | Yield difference between farms using conservation agriculture techniques | The yields of the farms that practice sowing on grass are always higher than those recorded for conventional farms with the exception of oats. |
| | Difference in GSP between grassland farms and conventional farms | As far as no tillage is concerned, consideringthat GSP is exclusively influenced by yield, productivity is always higher than that recorded for conventional farms, with the exception of oats. |
| **How can the quantification of GHG reduction through the application of organic farming techniques and no-tillage be used to promote and support payment schemes based on environmental performance?** | Monetary quantification of the environmental benefit | The current markets for carbon credits applicable to the agricultural sector (white certificates and voluntary market) are unattractive.<br>One possible scenario proposed involves the creation of a nationwide offsetting mechanism, through which the state could use credits generated by the agricultural sector to meet the 2030 targets |



[3] [4] Member States may promote and support collective schemes and outcome-based payment schemes to encourage farmers or otherbeneficiaries to produce a significant improvement in the quality of the environment on a larger scale or in a measurable way.

## 7. Conclusions and recommendations

| THEME | CONCLUSION | RECOMMENDATION |
|---|---|---|
| **Profitability of organic farms** | The downward trend in the price difference between organic and conventional production, together with the reduction in yields, is leading to a reduction in GSP for organic farms, which could discourage farms from participating in Measure 11. | Identification of a payment system based on the results, as provided for by art. 70, paragraph 5, EU Regulation 2115/2021. This is for the recognition of a positive environmental externality linked to the reduction of GHG emissions and quantified through the value of the tonne of $CO_2$ that determines an incentive that varies from 100 €/ha for no tillage to 200 €/ha for organic farming. |
| **GHG emission reduction targets in the agricultural sector** | The 2030 target of GHG emission reduction for Italy compared to 2005 is equal to an absolute value of 10.79 Mln $tCO_2$, as of 2017 emissions have been reduced only by 1.93 Mln, therefore by 2030 a further 8.86 Mln $tCO_2$ must be saved. | Creation of an offsetting mechanism at the national level, through which the State could use credits generated by the agricultural sector in the next programming period also in order to achieve the GHG reduction targets for 2030 |
| **Profitability of holdings practising minimum tillage** | The yields of the farms that practice sowing on grass are always higher than those recorded for conventional farms with the exception of oats. | Encourage the spread of sowing commitments that, while substantially maintaining farm profitability, guarantee high environmental benefits linked to the reduction of GHG emissions and the increase in soil fertility. |
| **Scarce diffusion on the regional territory of the commitments of no tillage** | The scarce adherence to the intervention of no tillage is attributable to the modest importance that farmers attribute to the reduction in production costs and to the improvement in soil fertility that no tillage determines. Moreover, the high cost of purchasing the machinery necessary for sowing on bare land is unsustainable, especially for small farms, and is accompanied by the reduced offer from contractors of work carried out with machines suitable forconservation agriculture. | Implementation of specific information actions aimed at raising farmers' awareness of the economic and environmental benefits of applying conservation agriculture techniques |