



Implementing Good Agricultural and Environmental Condition in the EU

Results of the 2010 GAEC workshop

Vincenzo Angileri, Philippe Loudjani



EUR 24659 EN - 2010

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MARS Ref.: JRC IPSC/G03/P/VAN/van D(2010)(12404)

JRC 62302
EUR 24659 EN
ISBN 978-92-79-18925-8
ISSN 1018-5593
doi:10.2788/81611

Luxembourg: Publications Office of the European Union

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Printed in Italy

Report

Results of the 2010 GAEC Workshop Rome, 6-8 October 2010

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Co-author:	Circulation: External
Approved: Simon Kay	:
Date: 16/11/2010	Int. ref: JRC IPSC/G03/P/VAN/van D(2010)(12404)

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1. Introduction

1.1. Report objectives

The aim of the report is to describe the main technical findings and results of the 2010 GAEC workshop organised by the Ministry of Agricultural Food and Forestry Policies and the Italian National Rural Network, together with AGEA and the technical support of the MARS Unit of the Joint Research Centre.

The workshop was held in Rome at the Hotel Hilton Rome Cavalieri from 6th to 8th October and it included a technical field visit in Viterbo area on 7th October 2010. 124 delegates attended the workshop representing 23 European Union Member States (all but Cyprus, Hungary, Luxembourg and Slovenia) and two candidate countries (Croatia and Iceland). European Commission was represented by two experts of the Joint Research Centre, three of the Directorate-General Agriculture and Rural Development and two of the Directorate-General Environment. On the third day Italian representatives of the Italian Rural Network joined the workshop for a total of about 200 delegates.

1.2. Acknowledgements

The authors would like to express sincere thanks to the Ministry of Agricultural Food and Forestry Policies, the Italian National Rural Network and AGEA for the organisation and hosting of this successful event. They would like to thank all persons that were involved in the organisation and management of the workshop and without whom the workshop could not have taken place. A special thank to Francesco Serafini, Christian Vincentini and Camillo Zaccarini for their active cooperation and personal sympathy.

They would also like to thank the presenters for agreeing to deliver their talks, as well as all participants for their contribution to the success of the event.

2. Outcomes of the plenary sessions

2.1. Background

- 2.1.1. In order to receive full direct payments farmers have to respect Good Agricultural and Environmental Conditions (GAECs). GAECs have been implemented since 2005. Since then, minimum requirements defined by Member States have undergone changes following clarifications given by the European Commission (e.g. all standards should be implemented), results of audit missions and specifications established by the Member States in order to make them more effective and linked to local conditions. The agreement reached by EU agriculture ministers on 20 November 2008 (the so-called Health Check) finally modified the existing GAEC framework which is now composed of 5 issues and 15 standards of which 8 compulsory and 7 optional (Annex III of Council Regulation (EC) No 73/2009).

2.1.2. The workshop objective was to discuss the current situation in implementing GAEC standards by the Member States and in particular the following topics: GAEC minimum requirements defined by the Member States, common understanding for minimum requirements, controlling GAEC with remote sensing and environmental effects of some GAEC minimum requirements.

2.2. Situation of the GAEC definition by Member States in 2009

2.2.1. The GAEC definition in Member States in 2009 represents the situation just before the modifications introduced to the GAEC framework by the Health Check come into effects.

2.2.2. DG AGRI presented the possible implementation approaches for each GAEC Annex III standard. According to the notifications sent by Member States to the Commission, a whole range of farmers' obligations was introduced by the Member States. Most standards are implemented with varying obligations approaches among Member States (e.g. minimum requirements for protecting soil from erosion under the standard "minimum land management reflecting site-specific conditions" can imply ploughing along contours, reduce tillage or ban of cultivation of row crops) or with different obligations according to different areas (e.g. obligation implemented in the whole country or only in vulnerable areas according to slope, soil type etc.). A few standards have a rather homogeneous implementation among MSs (e.g. ban on removing or damaging terraces or arable stubble management)¹. DG AGRI clarified that certain approaches notified were not acceptable, e.g. minimum soil maintenance is not sufficient under the standard "maintenance of olives and vines in good vegetative condition", nor roughly cultivated soil under "minimum soil cover".

2.2.3. Sometimes similar obligations are put under different standards in different Member States. Various definitions can serve the same objective according to local conditions.

2.2.4. This situation is compatible with the fact that European legislation leaves flexibility to the Member States to define the precise content of a GAEC standard taking into account local conditions, however the objective of the standard (left column of Annex III) should be reached. In all cases, minimum requirements established by the Member States shall define clear obligations for farmers and not be just general recommendations. The definition of a GAEC requirement should aim at clarity for the farmer and should avoid doubts in the implementation of it: expressions like "during the rainy period", "suitable maintenance", "applicable areas", "avoid overgrazing", "no unwanted vegetation", "on the majority of the parcel" do not give clear evidence of what the farmer is suppose to do. If the requirement gives the farmer the opportunity to choose among different options, every option should lead to the fulfillment of the objective of the standard. GAEC should not simply repeat requirements that are already covered in the framework of the Statutory Management Requirements legislation².

¹ Presentation: The new GAEC framework and its application by Member States: situation 2009 – Inge Van Oost, accessed at: http://mars.jrc.ec.europa.eu/mars/News-Events/GAEC-workshop-2010-Rome/Agenda-and-presentations/van_oost_6_oct.pdf

² Presentation: GAEC after the Health Check, impact on rural development – Inge Van Oost, accessed at http://mars.jrc.it/mars/News-Events/GAEC-workshop-2010-Rome/Agenda-and-presentations/van_oost_8_oct.pdf

2.3. Evolution and adjustment of previous GAEC obligations in some Member States

- 2.3.1. In **Italy** the GAEC requirements have been modified after the Health Check agreement. The national decree is a framework that has been subsequently acknowledged by Italian Regions through 21 Regional Regulations as in Italy Regions are competent for agricultural policy implementation. Recently in Italy two more groups of farmers have to comply with cross-compliance: beneficiaries of payments supporting grubbing up and restructuring of vineyards; and agro-environmental schemes beneficiaries within the horticultural sector.
- 2.3.2. Among the seven standards which are now classified as “optional standards”, six of those (all, but the new one on establishment and/or retention of habitats) have been already implemented in Italy and therefore their implementation is compulsory.
- 2.3.3. The main amendments of the standards obligations have been: the extension of the minimum cover to arable land and permanent crops (previously the obligation was limited to non-cultivated land); landscape features that shall be retained are the ones which are included in national and regional laws, but if Regions do not approve a regional provision, landscape features to be retained are all the ones listed in the European framework which means hedges, ponds, trees in line, in group or isolated.
- 2.3.4. Italy had doubts concerning to overcome was a possible overlapping between the GAEC standard retention of landscape features (especially hedges retention) and the agri-environmental schemes that in some Regions fund hedges planting and protection. It was clarified that landscape feature GAEC standard refers only to the non-removal of the feature and does not obligatory include specific environmental management action.
- 2.3.5. The standard “Establishment of buffer strips along water courses” will be implementing in Italy starting from 2012. Currently there are eight Italian rural development programs which fund the establishment of buffer strips. In some cases it may be necessary to amend these measures in order to make them coherent with the baseline established by the buffer strips standard.
- 2.3.6. Italy has experienced some difficulties in translating environmentally friendly objectives in administrative prescriptions which must be controlled. There are cases, where it is difficult to find a balance between environmental ambition and the possibility to control on-field applications.
- 2.3.7. In implementing cross-compliance in **Netherland** the principle of not increasing the administrative burden for the farmer was applied and, at the beginning, only national rules already in force were considered in cross compliance: only three GAEC standards for soil erosion and one standard for crop rotation were implemented³.
- 2.3.8. Following an enquiry by the European Commission in 2007 and the discussion that followed, the Netherlands introduced two more standards: one on arable stubble management (farmers must not burn crop residues on arable land following harvest, unless they have a derogation) and another on the

³ Presentation by Marga Rademaker, accessed at: http://mars.jrc.ec.europa.eu/mars/News-Events/GAEC-workshop-2010-Rome/Agenda-and-presentations/rademaker_pdf

retention of landscape features (the farmer has to notify the local authorities if he/she wants to cut trees in line, the authorities can refuse the authorisation or require that the farmer plants new trees).

- 2.3.9. As a result of the Health Check, other new standards for encroachment (farmer must mow, turn or graze his agricultural land at least once every two years), for the protection of permanent pasture (farmers must mow or graze permanent pasture every year) and for water authorization (farmers must not withdraw or infiltrate groundwater without a permit of the authorities) were introduced. In the Netherlands there is no need to introduce additional on buffer strips because the total area of the Netherlands is designated as a vulnerable zone according to the Nitrates Directive and therefore all farmers must respect the requirements relating to the conditions for land application of fertilisers near water courses, in accordance with the action programmes established under Article 5(4) of Directive 91/676/EEC.

2.4. Practices in some Member States

2.4.1. Practices to prevent soil erosion in Czech Republic⁴

- 2.4.2. In Czech Republic almost 40% of agricultural land is at risk of erosion. Some measures to prevent erosion have been established in the framework of GAEC.
- 2.4.3. On an arable land block or a part of it whose average slope exceeds 7 degrees, the farmer is required to sow the next crop immediately after the harvest or to apply at least one of the following measures: a) stubble is to be left on the land block or part thereof until 30th November at latest, or b) the soil is to remain ploughed, or at least tilled for the purpose of water absorption until 30th November at the latest.
- 2.4.4. On a land block or part of it which is designated in the land register as seriously at risk of erosion, the farmer shall ensure that wide-row crops of maize, potatoes, beet, sown beans, soy and sunflower are not grown. Cereals and rapeseed crops are to be planted on such areas using soil protection technologies, especially sowing into mulch or sowing without tillage. In the case of cereals, the condition of soil protection technology need not be adhered to only if they are to be sown with a clover under-sow. In order to define “seriously endangered by erosion” categories, criteria taking into account sloping, slope length, soil erodibility factor, rainstorms factor, erosion protective measures factor and factor of vegetation protective effect are used. Soil protective technologies are characterized by at least 30% soil surface coverage of the post-harvest residues (in crop germination time) and reducing the intensity of tillage: no-tillage sowing (direct seeding technology in untreated soil); sowing into mulch; sowing into shallow tillage; undercrop sowing (catch crop) etc.
- 2.4.5. For the implementation of the above requirement, it is important to provide farmers with the precise indication of the fields that are at risk of erosion. Farmers are given the list of fields with a slope more than 12 degrees. Digital models are applied which may also split fields in order to establish which part of the field is at risk of erosion. Currently 20m DTM are used, but there is a need to use 10m DTM to increase the accuracy of the definition.

⁴ Presentation by Martin Mistr, accessed at: <http://mars.jrc.ec.europa.eu/mars/News-Events/GAEC-workshop-2010-Rome/Agenda-and-presentations/mistr.pdf>

2.4.6. Practice to prevent soil erosion in Poland⁵

- 2.4.7. Following the CAP Health Check, the Polish Ministry of Agriculture and Rural Development introduced the following requirement regarding soil cover: “the area comprising at least 40% of arable land, located on the land prone to water erosion and constituting a part of an agricultural holdings must be kept under plant cover at least from 1st December to 15th February”. The list of areas prone to erosion was established based on analysis conducted by the Institute of Soil Science and Plant Cultivation – State Research Institute in Pulawy, Poland.
- 2.4.8. The methodology used considers the following factors: soil texture, terrain slope, amount and intensity of precipitation, soil cover and tillage (figure 1). Five classes of erosion hazard on arable land have been defined: 0- negligible or very low; 1- low; 2- moderate; 3- mean; 4- high; 5-very high. For soils which belong to group located on slopes above 27%: class 3 is used if precipitation is above 600 mm, class 4 for precipitation 600 – 800 mm, and class 5 for precipitation above 800 mm.

susceptibility to erosions	Slope %	Arable soil
Very strong susceptibility: Loess and loess like soils, silts, silts of alluvial origin	0-6	1
	6-10	2
	10-18	3
	18-27	4
	>27	5
Strong susceptibility: Light clays, sandy soils, rendzinas	0-6	1
	6-10	2
	10-18	3
	18-27	4
	>27	5
Medium susceptibility: Course loamy sands, lamy sands, tertiary rendzinas	0-6	1
	6-10	2
	10-18	3
	18-27	4
	>27	5
Weak susceptibility: Course sands, course soid – sandy clays, and sands underlined with clays, medium texture soils, clayly soils formed from sedimentary rocks.	0-6	0
	6-10	1
	10-18	2
	18-27	3
	>27	5
Very weak susceptibility: Heavy soils, clays, soils formed from gravel, mor. ch. areous, soils from crystalline rocks, peats	0-6	0
	6-10	1
	10-18	2
	18-27	3
	>27	3,4,5

⁵ Presentation by Artur Łopatka, accessed at: <http://mars.jrc.ec.europa.eu/mars/News-Events/GAEC-workshop-2010-Rome/Agenda-and-presentations/lopotka>

Fig. 1- Table for the use of erosion criteria

2.4.9. According to the methodology used, 9,1% of arable land has an erosion risk from low to very strong (fig. 2).

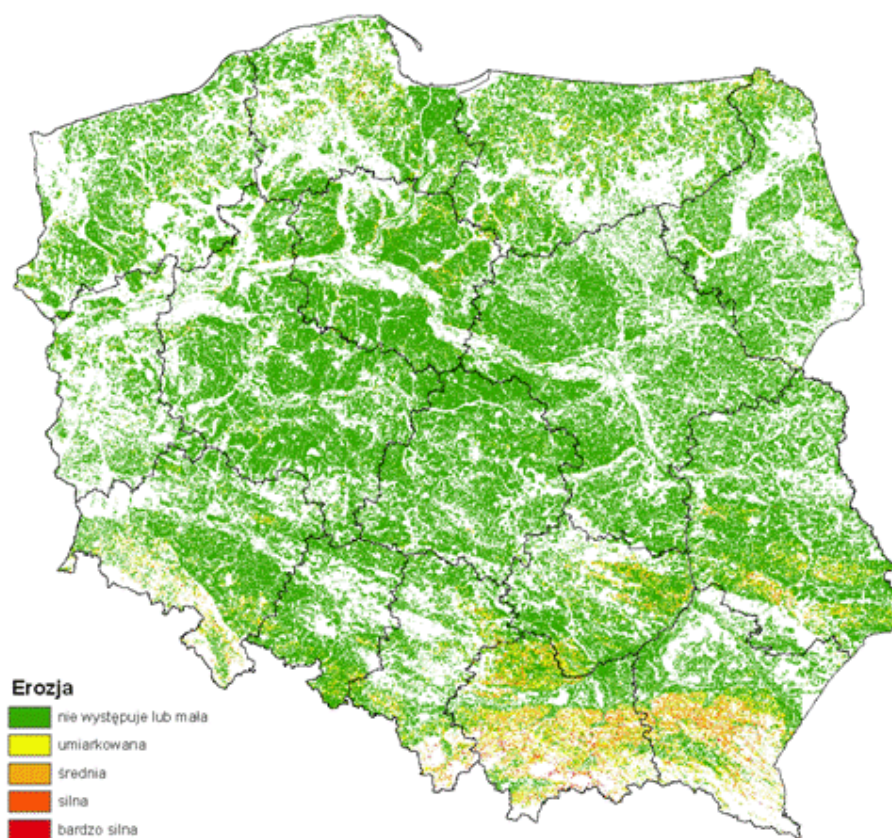


Fig. 2- Erosion map of Poland produced by the Institute of Soil Science and Plant Cultivation – State Research Institute in Pulawy, Poland (five classes from very low- green- to very high-red)

2.4.10. The main unit used to define the GAEC obligation for minimum cover is the cadastral village area (it is an area of limited size of 150 ha on average- and usually relatively uniform in terms of soil cover and relief), figure 3. In the cadastral village area if the area prone to erosion is more than 30% of the arable land, farmers in this village area shall respect the minimum cover standard. This conservative approach enabled a good spatial match with erosion risk map.

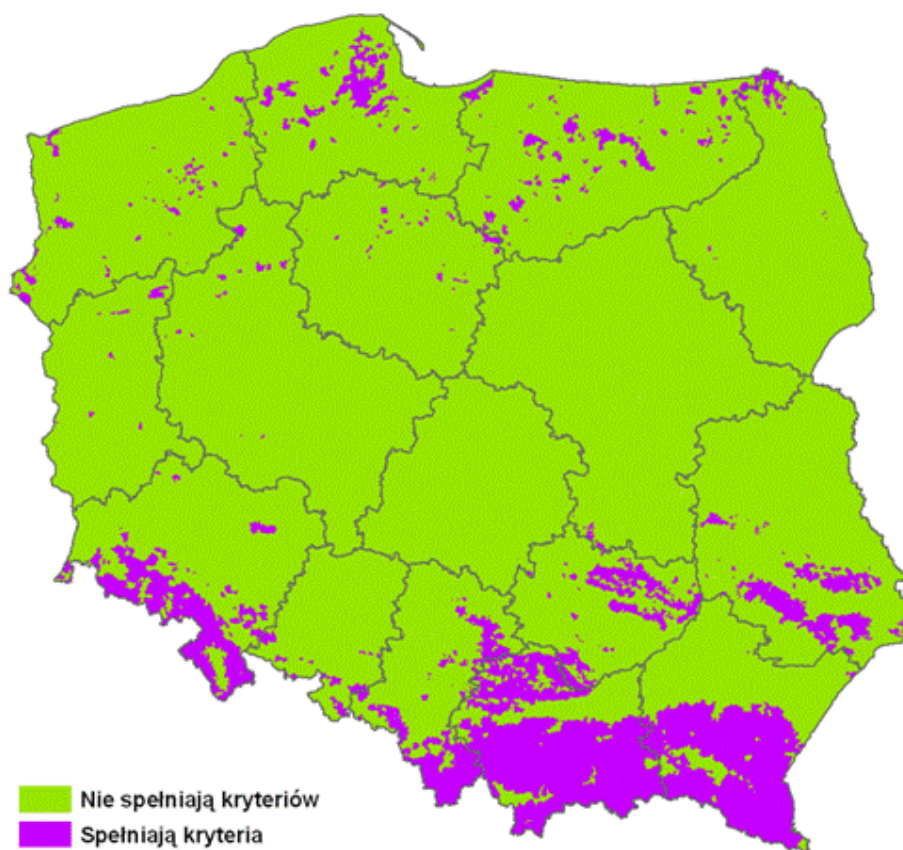


Fig. 3- Areas where minimum soil cover is obligatory

2.4.11. A comparison was made with the results obtained for Poland using the Universal Soil Loss Equation (USLE)⁶ model and this comparison shows a high correlation between the two models. In fact the USLE model is usually used in this kind of analysis, but in this case it was not used because the soil texture in the soil map of Poland is not very adapted to the USLE model.

2.4.12. The results of on-the spot controls for areas prone to erosion where 40% soil cover is obligatory shows a 3,78% cases of non-compliance.

2.4.13. **Management of Soil Organic Matter in Ireland⁷**

2.4.14. While Soil Organic Matter levels in Ireland are considered to be sufficient to sustain soils and maintain yields there still remains a requirement under the Single Payment rules to put procedures in place to ensure its maintenance in circumstances where it may be declining to critical levels which may cause

⁶ <http://www.ars.usda.gov/Research//docs.htm?docid=10626>

⁷ Presentation by Al Grogan, accessed at: <http://mars.jrc.ec.europa.eu/mars/News-Events/GAEC-workshop-2010-Rome/Agenda-and-presentations/grogan.pdf>

soils to become vulnerable. To this end, procedures to ensure that Soil Organic Matter (SOM) levels are maintained at adequate levels are implemented throughout the country.

2.4.15. Continuous arable is considered to be the only land in Ireland which may be at risk of declining SOM levels.

2.4.16. The following approach is now being taken to maintain SOM levels:

- Sample continuous arable land (>6 years) every 10 years for Soil Organic Matter. One sample per 4 ha or up to 8 ha where conditions are similar.
- Where the Soil Organic Matter levels are below 3.4% (2% Organic Carbon), a specialist advice from FAS approved advisor shall be requested.
- Any remedial action shall be applied where recommended.

2.4.17. As an obligation, the farmer must identify all parcels in continuous arable, arrange for OM testing every 10 years, where OM < 3.4% seek FAS advice, apply any necessary remedial action and maintain the GAEC OM record.

2.4.18. During inspection the farmer must provide completed documentation. The inspection service will inspect all documentation and be satisfied with any FAS recommendations where applicable and conduct sample of OM checks to verify records based on database check of cropping pattern.

2.5. Contribution of cover crops and crop rotation to good agricultural practice

2.5.1. Cover crops and crop rotation can contribute to the improvement of farming conditions in different ways such as: protection against water and wind erosion, inhibition of weed development, biological nematode management, input of fresh organic matter, improvement of soil structure and nitrate uptake and release⁸.

2.5.2. A demonstration project on the use of the nitrogen reserve by cover crops was carried out by the Soil Service of Belgium. It demonstrated that the use of the nitrogen reserve by cover crops depends on the type of cover crop and on the timing of sowing. The more biomass a crop produces, the more nitrogen uptake it will release. In order to obtain better results, after the harvest of the main crop, a cover crop shall be sown as soon as possible. Furthermore plowing the cover crop in spring avoids N release and leaching in winter. In fact, cover crops prevent the leaching of nutrients in autumn and release them for the following main crop. Weather conditions are also important as mineralisation is stimulated by warm and moist weather.

2.5.3. Organic matter is an important component of the soil. Organic matter improves soil structure, increases water storage capacity (especially in sandy soils), reduces erosion, is source of nutrients and

⁸ Presentation: Crop rotation and cover crops: which contribution for best practices? Inge Hermans, accessed at: <http://mars.jrc.ec.europa.eu/mars/News-Events/GAEC-workshop-2010-Rome/Agenda-and-presentations/hermans.pdf>

sequestrates carbon. Effective organic matter (EOM) is the part of the organic matter which is still in the soil after one year and contributes to the humus content of the soil.

- 2.5.4. During the last 25 years there has been a decreasing of carbon content in Belgian soils whose reasons could be: decrease of pasture and increase of arable land, change from farmyard manure to slurry, changes in crop rotations with a decrease of cereals and an increase of silage maize and root crops, loss of fertile topsoil due to erosion, intensive tillage and deep ploughing. Input due to crop residues can vary with the type of crop (figure 4) and cover crop (figure 5). For cover crops, the root system contributes more to the effective organic matter as it happens for grass.

	plant part	EOM kg/ha
potato	roots and leafs	850
sugar beet	roots, beettops and leafs	1200
winter cereals	roots and stubble	1500
	straw	1300
maize	roots and stubble (silage maize)	700
	roots, stubble and leafs (grain maize)	2400
flax	-	100
leek	-	100
alfalfa	first year	1350
	second year	2050

Figure 4- Effective organic matter produced by different types of crops

	dry organic matter(kg/ha)			% below ground	EOM Kg/ha
	above ground	below ground	total		
yellow mustard	3.100	800	3.900	21	750 – 950
fodder radish	3.100	800	3.900	21	750 – 950
phacelia	2.300	700	3.000	23	650 – 850
Italian ryegrass	2.500	2.000	4.500	44	900 – 1.100
English ryegrass	2.200	2.000	4.200	48	900 – 1.100

Figure 5- Effective organic matter produced by different types of cover crops

- 2.5.5. There are some management practices that can help maintain soil organic matter levels, such as: crop rotation with more cereals, ploughing in of the straw, growing grain maize instead of silage maize, avoiding monoculture of silage maize, frequent (grass) cover crops, adding grass leys or lucerne in the rotation.

- 2.5.6. It was demonstrated that in silage maize monoculture, the use of 20 ton of cattle farmyard manure (including straw) per hectare can maintain a sufficient level of OM and also increase it (700 kg/ha OM due to silage maize + 1600 kg/ha OM due to cattle farmyard manure = 2300 kg /ha OM which represents more than the requested good minimum level of 1.500 kg/ha OM). On the contrary, the use of 20 ton pig slurry in silage maize would be insufficient, as it will only add 400 kg/ha OM (total = 1100 kg/ha OM, i.e. below the needed 1500 kg/ha). Minimum level of OM can be maintained also if silage maize is followed by a grass cover crop (700 kg/ha OM due to silage maize + 1000 kg/ha OM due to grass cover crop = 1700 kg/ha).
- 2.5.7. In order to raise the awareness of Flemish farmers concerning the importance and the use of organic matter a carbon simulator was developed that can estimate the long term evolution of the organic carbon content in arable land in function of the crop rotation and fertilization practices.

2.6. Controlling GAEC with remote sensing

- 2.6.1. A study has been carried out by AGEA-SIN with the involvement of the Italian Ministry and the Italian Rural Network within a framework contract with the JRC. The feasibility of using remote sensing to control some GAEC standard has been tested⁹.
- 2.6.2. Winter cover requirements in Italy requires winter coverage with crops or natural grass in sloping arable parcels prone to erosion. Test refers to (semi) automatic classification of possible arable areas in infringement (sloping and not vegetated), through SAR/optical data and derived products. The use of the tested methodology will give the opportunity to focus and locate rapid field visits only on risk farms/parcels.
- 2.6.3. The test has been performed in a 25 km² area in the Marche region using COSMO-SkyMed Image dataset and GeoEye-1 data. The class of interest is clearly detectable and no particular photo-interpretation experience is required. Additional information required is the DEM (Digital Elevation Model) to define all the steep agricultural areas and optionally the parcel boundaries. Multitemporal Image (MTC) product shows excellent capabilities for un-vegetated fields discrimination and SAR full constellations (COSMO-SkyMed-Terrasar X) allow MTC generation. SAR imagery also guarantees high coverage at high resolution (3m-5m) without regarding visibility conditions.
- 2.6.4. The GAEC related to landscape feature requires the localization and preservation of landscape features whose conservation is important to avoid the deterioration of habitat. Features of interest are: hedgerows, hedge-trees and field borders; scattered trees: small lakes, water reservoir and ponds; terraces and stone walls.
- 2.6.5. About fields separation, preliminary feasibility on SAR shows good extraction capabilities on flat/medium morphology. The usage of Image guarantees high extraction performances combining mosaicking capabilities.

⁹ Presentation: Controlling GAEC with remote sensing- Paolo Tosi, Livio Rossi, accessed at: http://mars.jrc.ec.europa.eu/mars/News-Events/GAEC-workshop-2010-Rome/Agenda-and-presentations/tosi_rossi

- 2.6.6. Results of preliminary tests of detecting lakes, water reservoir and ponds automatically or semi-automatically about using COSMO-SkyMed HImage, and as optical reference 2010 AGEA, show good capabilities of semi-automatic ponds extraction. Semi-automatic procedure guarantees better performances than optical classification (timing; no spectral signatures); automatic procedure can be noticeably improved by ad-hoc development. All the reservoirs having a dimension bigger than 350 m² were correctly classified. Missing features regard objects smaller than 250 m² which are not clearly visible in SAR due to surrounding fields with low level of backscattering (i.e. flat bare soil, shadows..).
- 2.6.7. About scattered trees and terraces, preliminary tests have been carried out using traditional stereo couples of air photos 0,5m for the generation of large scale DSM (Digital Surface Model) 2m by 2m and vertical accuracy (default 20 by 20m) and the integrated use of DSM with multispectral imagery and ancillary information. Preliminary feasibility of optical DSM high accuracy shows complete extraction capabilities. Geometric limitation appears in line with the intrinsic value of the spacing grid (2m x 2m range).
- 2.6.8. Starting from the results of preliminary tests, further activity is planned for the future in order to identify the best methods and relative benefits/costs for managing the entire Italian agri-environment, offering: suitable tools for a complete/continuous monitoring; useful territorial risk analysis; feasible controls.

2.7. Environmental effectiveness of GAEC standards

- 2.7.1. The analysis of the environmental effectiveness of GAEC standards in Italy has been carried out through the EFFICOND project of the Italian Agricultural Research Council which started in 2009¹⁰. Research was carried out in the Research Centres of the CRA (Italian Council for Research in Agriculture) distributed on the Italian territory and representing different environmental conditions in Italy. The research included data collected from other national researches, carried out in the past (CRA, Universities etc.) in which the experimental design included the evaluation of the environmental effect of practices similar to those of the GAEC standards.
- 2.7.2. Temporary drainage ditches across the slope or grass strips seem to have effectiveness in preventing erosion. By applying the RUSLE model¹¹, it is demonstrated that this standard reduces soil erosion of about three times than the situation without ditches. In fact the deposition of sediment inside the ditches keeps the soil on the slopes and reduces the sediment supply to the river network. Anyway to be effective against soil erosion, ditches need to be realized in a correct way. The standard alone cannot effectively counteract the erosion that occurs in extreme events of rainfall (events that are becoming more and more frequent and extreme due to climate change); in this case the standard needs to be integrated by agri-environmental measures (e.g. conservation tillage, cover crops etc.).
- 2.7.3. Instead of temporary ditches, as an alternative in the definition of the Italian standard, farmers can keep grass strips across the slope. It was demonstrated that grass strips across the slope can reduce soil

¹⁰ Presentation: Report on evaluation of Cross-Compliance enforcement in Italy – Camillo Zaccarini Bonelli, Paolo Bazzoffi, accessed at: <http://mars.jrc.ec.europa.eu/mars/News-Events/GAEC-workshop-2010-Rome/Agenda-and-presentations/bazzoffi.pdf>

¹¹ http://fargo.nserl.purdue.edu/rusle2_dataweb/

erosion of about 8 times. Soil erosion is greatly reduced both because of the highly protective effect of vegetation cover throughout the year and because of the effect of no-tillage.

- 2.7.4. The effectiveness of terraces against soil erosion was assessed and demonstrated by applying the RUSLE model in sample areas. Stonewalls are also arid micro-environments suitable for many species with a positive effect on habitat.
- 2.7.5. The standard on the prohibition of unauthorized land leveling is considered adequate, but it is not effective enough, because in Italy only a few municipalities take land leveling into consideration in their territorial governance legislation. Municipal authorizations should be granted on condition that strict rules of soil conservation are applied.
- 2.7.6. The standard on managing stubble and crop residues (arable stubble management) was demonstrated of limited effectiveness in the maintenance of the quantity of organic matter and its qualitative improvement. The standard has more positive effects for the habitat, due to its importance in reducing wildfires. Addition of small amounts of nitrogen on crop residue before ploughing could be a measure to increase organic matter, but this could be suggested as an agri-environmental scheme. Also the standard on crop rotation was of limited effectiveness in the maintenance of the quantities of organic matter, and it should be adapted with the inclusion of forage crops in rotation, crop residue management and minimum tillage.
- 2.7.7. About the standard on ploughing in good soil moisture conditions, the experimental plots demonstrated that ploughing in good soil moisture condition determines higher crop production and less weed infestation than ploughing in bad soil moisture condition. Anyway the results of experiments show that this standard could be limited to some soil textures only (e.g. clay soil).
- 2.7.8. About the prohibition to reduce or convert the area of pasture to other uses, research found that in Italy undergrazing is the major threat for the maintenance of a good plant composition of permanent pastures. The optimal load of cattle for the maintenance of the pastures is estimated between 0.3 and 3 LU /ha (Livestock Units/ha).
- 2.7.9. The Italian standard on weed control through mowing appears to be ineffective and even harmful from the agronomic point of view. In fact, a single mowing can not control the spread of natural vegetation to nearby fields. Anyway residues left on soil surface after mowing determined an increase of soil biodiversity, due to a higher amount of available litter in decomposition that feeds the organisms that make humus in the soil.
- 2.7.10. It was demonstrated that the presence of grass cover throughout the year on set aside increases the soil biological quality due to a higher presence of arthropoda, reptiles and mammals.

2.8. GAEC standards and public goods

- 2.8.1. GAEC is one of a range of mechanism that can help to provide public goods. As markets cannot coordinate supply and demand on public goods and there is little incentive to provide them, some form

of public intervention is justified. In this context GAEC can provide a foundation on which incentive payments can be built (i.e. agri-environment schemes)¹².

- 2.8.2. Some standards related to the issue “Minimum Level of Maintenance” are the ones that can have major effect in providing public goods (e.g. retention of landscape features, establishment of buffer strips on water courses). Anyway these standards applied differently across the 27 EU Member States.
- 2.8.3. French standard on the retention of landscape features is an example of an obligatory area-based approach providing public goods. A proportion of ‘structural elements’ shall be maintained on all types of holding (1% of a holding in 2010, 3% of a holding in 2011 and 5% of a holding by 2012). If sufficient structural elements do not exist, they must be created. A similar voluntary based approach is followed in England with the “Campaign for the Farmed Environment” (retain un-cropped land on a voluntary basis).
- 2.8.4. In the implementation of GAEC some benefits to the environment has been already realized for landscape features and biodiversity. A significant potential to deliver more exists, building on what has already been achieved.

2.9. Synergies between cross compliance and agri-environmental measures for soil protection

- 2.9.1. An example of synergies between cross compliance and agri-environmental measures for soil protection was presented for an Italian region (Veneto)¹³.
- 2.9.2. In Italy in accordance with the National Strategic Programme (NSP) update and RDP (Rural Development Programmes) reprogramming following the CAP Health Check, Regions and Autonomous Provinces have been called to specifically update their RDP development strategies by integrating or strengthening the related purposes for new challenges. The purpose is to strengthen capacity to improve the response to the new challenges (among which fighting against climate change) using the existing RD measures.
- 2.9.3. A new measure “Conservative agriculture” has been introduced in the RDP of Veneto Region. This measure, based on the use of conservation agriculture techniques on at least 25% of the farm arable land (sod-seeding), implies also other different engagements that go beyond the different minimum requirement established in the GAEC and SMR such as apply nitrogen and phosphorus at different times and close to the seed and ready to be used by the plant, soil covered all year round (by sowing a second crop or a cover crop), leaving any crop residues on the ground (mulching), applying diversified crop rotations etc. Beneficiaries farmers gets 400 €/ha per year, for a period of five years.

¹² Presentation: GAEC standards and public goods: the cases of biodiversity and landscape- Ben Allen, accessed at: <http://mars.jrc.ec.europa.eu/mars/News-Events/GAEC-workshop-2010-Rome/Agenda-and-presentations/allen.pdf>

¹³ Presentation: Synergies between Cross Compliance and agri-environmental measures for soil protection in Veneto Rural Development Programme – Barbara Lazzaro, accessed at: <http://mars.jrc.ec.europa.eu/mars/News-Events/GAEC-workshop-2010-Rome/Agenda-and-presentations/lazzaro.pdf>

3. Outcomes of the field visit

- 3.1.1. The second day of the workshop was given over to two field visits. The first visit was to observe and discuss some erosion problems in an area near Tarquinia. That was an opportunity to see erosion signs and discuss the relevance of the Italian GAEC standard that obliges farmer to have temporary gullies in the fields at erosion risk.
- 3.1.2. The second visit was to a farm in Viterbo province (Podere La Branda). The farm represents a good model of multifunctional agriculture. Only using organic production methods, farm main products are olive oil, nuts, potatoes, fruits and vegetables. This activity is integrated by the organisation of events and bed and breakfast service in the farm buildings. After a brief introduction of the farm activities, visitors were divided in three groups for farm works where different aspects of the Italian GAEC implementation were shown and discussed.

4. Outcomes of the exercise with delegates

4.1. Exercise on good practices

- 4.1.1. During the workshop an exercise was carried out with participants on common understanding of the implementation of GAEC. The exercise was based on a brainstorming technique derived from the model "OPERA" produced by Innotiimi.
- 4.1.2. On the basis of the analysis of the minimum requirements defined by the Member States and taking into account scientific basis, for each standard a list of practices were proposed to the audience as an orientation to discussion¹⁴.
- 4.1.3. Participants were then divided into groups of about 10 persons each. Each group had to discuss about some GAEC standards and define a list of practices on which all group components could agree as a good minimum level of implementing the discussed standards.
- 4.1.4. The discussion within each group lasted 45 minutes; at the end each group wrote down a number of practices recognized as a common basis for the standards they were asked to discuss.
- 4.1.5. At the end of the exercise it was clear that:
 - After years of implementing GAEC standards and the experience acquired so far, there is a need of a common understanding that can help Member States further define useful minimum requirements;
 - A common understanding is related to the meaning of the standard and the effect that a practice must have in relation to the objective of the standard and taking into account that GAEC represents a baseline above each efforts requested to farmers can be supported through rural development measures

¹⁴ Presentation: Ideas for an exercise on GAEC best practices- Vincenzo Angileri, accessed at: <http://mars.jrc.ec.europa.eu/mars/News-Events/GAEC-workshop-2010-Rome/Agenda-and-presentations/angileri.pdf>

- Common understanding does not mean a good practice to be used as a minimum level of GAEC implementation for all the Member States in the European Union. Local conditions are different and, according to legislation, Member States are required to take them into account in defining minimum requirements in the definition of GAEC;
- A way to identify this common understanding is to assess the effect that some practice can have on the environment on the basis of scientific and practical research;
- A similar exercise to the one carried out during the workshop could be repeated among scientists in disciplines related to GAEC;
- It could be used to create a web portal platform where research results can be accessed and used as common basis in the definition of the minimum requirements.

5. Conclusions

5.1.1. The workshop demonstrated that progress has been made on GAEC implementation since cross compliance has been introduced in the CAP. Member States have amended and fine-tuned GAEC requirements and better detailed their GAEC implementation during the years. GAEC introduced new pieces of legislation on matters where legal constraints did not exist before (e.g. soil). Some Member States have also developed methods to apply requirement differently according to local characteristics (e.g. slope, soil types etc.).

5.1.2. The interest of Member States in GAEC is confirmed by the high participation in this workshop and also by the attention given during the exercise on common understanding that was carried out during the event.

5.2. Needs that have come forward

5.2.1. Some needs of clarification have come forward and the workshop has effectively contributed to fulfill these needs. They mainly refer to:

- the meaning of some GAEC standards and their purposes;
- the definition of the GAEC minimum requirement taking into account that GAEC requirements represent a baseline in the implementation of the second pillar schemes (i.e. only practices that go beyond GAEC requirements can be funded in the rural development programmes); this issue can be quite important for some standard like landscape features;
- the definition of the relationship between GAEC standard and the eligibility concept (i.e. the definition of agricultural activity which includes the “maintaining the land in good agricultural and environmental condition”¹⁵);
- the opportunity of identifying and registering in the LPIS elements with GAEC relevance;

¹⁵ Council Regulation (EC) No 73/2009 of 19 January 2009, art. 2

- which practices actually fulfill GAEC standards objectives, without increasing the administrative burden for farmer and allowing the feasibility of controls.
- 5.2.2. A need of communication towards the broad public has been highlighted too. It concerns the necessity of explaining to the European citizens the concept of GAEC and stress the role of the farmer in providing public goods through some GAEC standards. At the same time GAEC concept needs to be explained to farmers with a pro-active approach able to provide them with the information not only on the practices to be implemented but also on their scope and their effectiveness.
- 5.2.3. In order to implement GAEC standard by the farmers correctly, the role of the Farm Advisory System has been highlighted as well as the need of strengthening it and making it more accessible to the farmers.

5.3. Solutions and tools proposed

- 5.3.1. Information on possible GAEC standard definitions is currently provided through the diffusion of the information contained in the JRC web GAEC database among experts in charge of cross-compliance in the Member States. However, care must be taken as these definitions are not formally endorsed by the Commission.
- 5.3.2. However in order to fulfill the need for clarification and exchange of information, workshops organised by Member States together with JRC on GAEC and FAS seems to play an important role. They represent an effective moment of debating current issues and exchange experiences on good practices implemented by different Member States. Brainstorming exercises, like the one carried out during the workshop, could be a way to improve common understanding and to enhance a more common playfield in the implementation of GAEC. At this regard it would be useful to extend the participation in this kind of exercise to researchers in GAEC related topics.
- 5.3.3. In order to share information and data of studies and research linked to GAEC farming practices, the creation of a portal gathering the results of practical research can be realized. This portal should gather links to studies and research on the effectiveness of practices implemented in the framework of GAEC, like the projects that have been presented during this workshop. This in a view to promote a more effective link between research and cross-compliance policy and help give scientifically based answers to precise questions on precise environmental issues asked by policy makers. Member States representatives seemed to be very interested in using data coming from research and practical experiences in order to help them make their choices in GAEC implementation.
- 5.3.4. Remote sensing still represents an essential tool for providing information to be used in the control of GAEC. It was demonstrated by some studies carried out that many GAEC requirements can be effectively controlled using remote sensing. The matter of visual checking versus registration of elements to be used in cross compliance checks remains an open issue that should be assessed case by case with a cost-benefits approach also in the medium-long term.

- 5.3.5. Information acquired by remote sensing can also be used to provide farmers with information in order to make them aware of practices that should be undertaken (i.e. not removal of features identified as landscape features in the framework of GAEC).
- 5.3.6. In wider prospective remote sensing information combined with GIS tools can also be used for the management of rural areas. During the workshop the potentiality of these combined tools has been showed (i.e. in the definition of buffer strips along water courses by overlaying different layers produced with satellite information). Anyway in order to be practically implemented, these models should be supported by results coming from field experience.

6. Annex 1- Workshop agenda

Wednesday, 6th October

Session 1

09.30	<p align="center">Delegates registration</p> <p align="center">Welcome coffee</p>
10.00	<p align="center">Welcome speeches</p> <p align="center">Giuseppe Blasi (Director General for Rural Development – Ministry of Agricultural Food and Forestry Policies)</p> <p align="center">Philippe Loudjani (European Commission – JRC)</p>
10.15 – 11.00	<p align="center">The new GAEC framework and its application by Member States: situation 2009 – Inge Van Oost (EC, DG Agri D3)</p>
11.00 – 11.30	<p align="center">GAEC implementation in Italy after the Health Check – Antonio Frattarelli (Ministry of Agricultural Food and Forestry Policies)</p>
11.30 – 13.30	<p align="center">Practical implementation of GAEC in some Member States:</p>
11.30 – 12.00	<p align="center"><i>Marga Rademaker, Ministry of agriculture, Netherlands</i></p>
12.00 – 12.30	<p align="center"><i>Martin Mistr, Milan Kouril, Ministry of agriculture, Czech Republic</i></p>
12.30 – 13.00	<p align="center"><i>Artur Łopatka, Institute of Soil Science and Plant Cultivation, Poland</i></p>
13.00 – 13.30	<p align="center"><i>Al Grogan, Department of Agriculture, Fisheries and Food, Ireland</i></p>
13.30	<p align="center">Lunch</p>

Session 2

15.00 – 17.15	<p align="center">Exercise on best practices in GAEC implementation</p>
	<p align="center">Crop rotation and cover crops: which contribution for best practices? Inge Hermans (Soil Service – Belgium)</p>

	Ideas for an exercise on GAEC best practices- Vincenzo Angileri (EC, JRC)
17.15 – 17.30	Coffee break
17.30 – 18.00	Controlling GAEC with remote sensing- Paolo Tosi, Livio Rossi (AGEA – SIN, Italy)
18.00 – 18.15	Discussion
20.30	Gala dinner

Thursday, 7th October

Session 3 – Field visit

08.00	<p>Departure to the farm “Podere La Branda” – Vetralla (Viterbo)</p> <p>On the way to the farm, a stop to observe and discuss erosion issues in the Tarquinia area is foreseen.</p> <p>Welcome coffee</p> <p>Official Greetings by Lazio Region – Angela Birindelli, Councillor for Agricultural policies</p> <p>Description of the farm and field exercise</p>
14.00	Lunch
	Discussion on the observed cases and finalisation of the exercise on best practices
18.00	Arrival in Rome

8th October 2010

Session 4

9.30	<p>Registration of participants at the third day</p> <p>Welcome coffee</p>
10.00 – 10.15	Introduction – Giuseppe Blasi (Director General for Rural Development – Ministry of Agricultural Food and Forestry Policies)
10.15 – 10.45	GAEC after the Health Check, impact on rural development – Inge Van Oost (EC, DG Agri D3)

10.45 – 11.30	Report on evaluation of Cross-Compliance enforcement in Italy – Camillo Zaccarini Bonelli (National Rural Network - RRN), Paolo Bazzoffi (Centre of Research in Agriculture - CRA)
11.30 – 11.50	GAEC standards and public goods: the cases of biodiversity and landscape – Ben Allen (Institute for European Environmental Policy – London)
11.50 – 12.10	Synergies between Cross Compliance and agri-environmental measures for soil protection in Veneto Rural Development Programme – Barbara Lazzaro (Veneto Region)
12.10 – 12.30	Cross Compliance implementation: first assessment and outlooks for the future – Paulo Gouveia (COPA COGECA)
12.30 – 12.50	Farm Advisory Services in supporting farms: what is the outlook for the future? – Alberto Giuliani (National Council of Doctors of Agronomy and Doctors of Forestry)
12.50 – 13.45	Discussion
13.45 – 14.00	Final speeches (EC, JRC - Ministry of Agricultural Food and Forestry Policies)
14.00	Lunch

All presentations may be accessed on-line at:

<http://mars.jrc.ec.europa.eu/mars/News-Events/GAEC-workshop-2010-Rome/Agenda-and-presentations>

European Commission

JRC 59444 – Joint Research Centre – Institute for the Protection and Security of the Citizen

Title: Results of the 2010 GAEC Workshop

Author: Vincenzo Angileri and Philippe Loudjani

Luxembourg: Publications Office of the European Union

2010 – 24 pp. – 21 x 29,7 cm

EUR 24659 EN– Scientific and Technical Research series – ISSN 1018-5593

ISBN 978-92-79-18925-8

doi:10.2788/81611

Abstract

JRC-IPSC action GeoCap, together with the Italian Ministry of Agricultural Food and Forestry Policies, the Italian National Rural Network and AGEA organised the 2010 Good Agricultural and Environmental Condition (GAEC) workshop. The event, held in Rome on 6-8 October, was attended by 124 delegates from 23 Member States, 2 accession countries and the European Commission. The technical presentations and discussion covered good practices for the minimum requirements defined by the Member States and their effects of the environmental, and the control of GAEC with remote sensing. The workshop included a field visit to observe the practical implementation of GAEC in Italy and a group exercise aimed at defining a common understanding among delegates of the GAEC framework. The workshop demonstrated that progress has been made on GAEC implementation since cross compliance has been introduced into the CAP. Results will be valuable for future research work on GAEC, mainly on the assessment of good practices implemented at national level.

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EUR 24659 EN – 2010
LB-NA-24659-EN-C



ISBN 978-92-79-18925-8

