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Green direct payments: implementation choices of nine Member States and their environmental implications

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Disclaimer: The arguments expressed in this report are solely those of the authors, and do not reflect the opinion of any other party.

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Introduction and Context

One of the major changes to the architecture of Pillar 1 of the CAP in the 2014-2020 period is the inclusion of three measures providing 'payments for agricultural practices beneficial for the climate and the environment, otherwise known as 'green direct payments' or 'greening'. These practices are:

- crop diversification;
- the maintenance of permanent grassland; and
- Ecological Focus Areas (EFA).

Member States must allocate 30 per cent of their national CAP Pillar One budget ceilings for these annual payments, which are available to nearly all farmers on top of the their (now reduced) annual basic payment.

The practices should take the form of "simple, generalised, non-contractual and annual actions" that go beyond cross compliance. In addition to the basic model of green payments whereby the three measures apply directly, there is an alternative approach that Member States may take. This allows 'equivalent practices' to be introduced, these can be similar practices providing an equivalent or greater benefit for the environment and climate than the three basic measures.

The greening measures were subject to intense negotiation and amendment during the CAP reform process and the rules that were finally agreed provide Member States with a lot of flexibility regarding their implementation. The focus of this report, is to set out the implementation decisions taken by nine Member States with regard to the three greening measures in 2015, the first year in which they have to be applied. It then goes on to provide a preliminary view of the potential that these decisions have for delivering improved environmental management on farmland. However, in doing this, the operation of the greening measures cannot be seen in isolation. Their interaction with cross-compliance requirements and Pillar 2 area payments on farmland, particularly the agri-environment climate measure, need to be considered. The report therefore looks at the changes in the cross-compliance framework in the nine Member States and in more limited way at the interactions of the greening measures with Pillar 2 area payments for example agri-environment-climate schemes. This could be taken further once more Rural Development Programmes have been approved and published.

The report, of necessity, focusses on the pollicy measures that have been adopted. The way that farmers implement these on the ground in due course will have a significant effect on the potential of the measures to change land management and deliver environmental benefits. However, it is too early to assess actual implementation on the ground. Rather the role of this report is to point towards some of the strengths and weaknesses of the approaches taken in a sizeable group of Member States from an environmental perspective.

The countries investigated are: France, Germany, Italy, Hungary, the Netherlands, Poland, Romania, Spain and the UK. Information was gathered via questionnaires to Member State

experts during winter 2014 and spring 2015. This was supplemented by data made publicly available by DG Agriculture on its website and literature on the potential environmental implications of the greening measures.

Implementation of the greening measures in selected Member States

All 28 Member States have put in place the standard three greening practices. However, five will also allow greening by equivalence (FR, NL, AT, PL, IE). Only the Netherlands and Poland have chosen to make use of the flexibility to implement EFAs by groups of farmers collectively and none are taking a regional approach to EFA implementation.

Of the five Member States which have chosen to allow greening by equivalence, two have allowed the implementation of equivalent practices via certification schemes - France (for crop diversification) and the Netherlands (for EFAs). The remaining three Member States have introduced equivalent measures into their agri-environment-climate schemes – Ireland and Poland just for crop diversification and Austria for both crop diversification and the EFA measure.

Crop diversification: The rules for the crop diversification measure allow little flexibility to Member States. Where equivalent practices have been introduced, it is most frequently for this measure. For example France has introduced a certification scheme for single crop maize producers and Poland (as well as Austria and Ireland) has introduced equivalent practices via its agri-environment-climate scheme for this measure.

Ecological Focus Areas: Member States have a choice of 10 standard elements that they can make available to farmers to fulfil their EFA obligations on arable land. If they opt for the landscape features element, they can also choose which of a series of nine specified landscape features are eligible to count towards the EFA obligation.

For each of these elements there are additional choices to be made regarding their implementation. For example, in the case of nitrogen fixing crops, catch crops/green cover and short rotation coppice Member States must choose the types of crops permitted, as well as where, when and how they can be grown. This includes whether fertilisers and pesticides are permitted and when the crops must be in the ground.

The stated objective for the EFA measure is 'to safeguard and improve biodiversity on farms'. The implementation choices made by national authorities will impact upon the degree to which this objective is met and the broader environmental potential of the measure is realised in practice.

For the whole EU-28, the most popular EFA elements, chosen by more than two-thirds of Member States are areas with nitrogen fixing crops (27 MSs), followed by land lying fallow (26); landscape features (24); areas with short rotation coppice (20); and areas with catch crops or green cover (19).

For the nine countries reviewed for this study, the elements chosen reflect this same pattern. France, Germany and Hungary have chosen to implement all EFA elements that are available, with Italy opting for all but catch crops and green cover. The Netherlands and

Spain have chosen to allow the least number of elements to farmers to fulfil their EFA obligations (four each) and the UK regions have also limited the options available. The reported reasons for choosing a limited rather than full range of options are varied and include:

- where the element is already covered by cross-compliance and no further action is deemed necessary via greening;
- Where an option is not considered sufficiently beneficial environmentally (whether generally or in a national context) to meet EFA objectives; and/or
- Where implementation may pose difficulties in relation to the control and verification of actions – for example where certain features are not easily mapped and therefore their identification is problematic and could increase the risk of disallowance.

The report looks at each of these elements in detail, setting out how they have been implemented, the rules applied and their environmental implications. There are very varied rules and requirements being put in place for each of the measures. However, most countries have permitted fertilisers and pesticides to be used wherever this is permissible, for example on N-fixing crops, catch and cover crops. The Netherlands is the only country reviewed to have banned the application of fertilisers on N-fixing crops, Germany has banned fertilisers and pesticides on catch crops and green cover, with the Netherlands only banning pesticide use on these crops.

Of the countries reviewed here, only the Netherlands applied to the Commission to offer farmers the option of meeting their EFA requirement via equivalent practices, although Scotland (UK) is understood to be considering this option for 2016. In the Netherlands, two separate certification schemes have been approved offering equivalent practices to greening: the 'Akkerbouw-strokenpakket incl. Vogelakker' (arable strip package, including bird fields); and the Veldleeuwerik (Skylark Foundation).

One of the critical factors determining the choice of options within the EFA 'menu' was the ease with which they could be administered, controlled and verified to minimise any risk of disallowance of the government's CAP payments from the EU. Those elements that are easiest to control and verify tend to be in-field measures, given that they are already the focus of Pillar 1 controls as well as the protection of easily identifiable landscape features, particularly where these are already mapped and controlled in a rigorous way for cross-compliance, for example.

Maintenance of permanent grassland: There are two elements to the greening measure for the maintenance of permanent pasture, within the agricultural sector.

Firstly, Member States must ensure that the ratio of permanent grassland to total agricultural area does not decrease by more than 5% compared to the situation in 2015. The percentage change may be calculated at national, regional or appropriate sub-regional level. The objective of the measure is 'to ensure environmental benefits, in particular carbon sequestration'. The same requirement was in place under cross-compliance previously, although the percentage decline permitted was up to 10%. Almost all Member States (23)

have chosen the most flexible route for maintaining the ratio of permanent grassland by applying it at the national level. Of the countries reviewed, France, Germany and the UK are the only countries to implement this rule at the regional level.

Secondly Member States are required to designate environmentally sensitive permanent grassland (ESPG) in areas covered by the birds and habitats Directives, (including in peat and wetlands situated in these areas), where strict protection is required to meet the objectives of those Directives. Member States also have the option to designate further areas of ESPG not covered by the Habitats Directive. Where land is designated, there is a ban on ploughing and conversion of permanent grassland within these areas. The objective for designating ESPG is to protect species, land of high nature value, reduce soil erosion and protect water quality. However, carbon sequestration will be another important outcome of a ban on ploughing, particularly on those on soils with high organic matter content, such as peatlands and wetlands.

ESPG within Natura 2000 areas: The proportion of land within Natura 2000 areas that has been designated as environmentally sensitive varies significantly between Member States, from as little as one per cent in Estonia and Portugal to 100 per cent in ten Member States plus three of the UK regions (England, Northern Ireland and Wales). The total area of land designated as ESPG is 7.49 million hectares, accounting for 74% of permanent grassland in Natura 2000 areas.

Of the countries reviewed in this report, only four designated less than 100% of their Natura 2000 areas, namely Germany, France, Poland and Scotland in the UK. The reasons for this were varied. In Scotland, certain semi-natural grassland habitats depend on periodic cultivation for their survival (e.g. machair) and were therefore excluded. In France two criteria were used to identify ESPG, one relating to certain semi-natural areas with very low agricultural management (heathland, moorland etc) and the second to identify species-rich 'natural pastures'. In France, this has meant that some pastures that contain protected species, but not a diversity of species, are left unprotected.

ESPG designated outside Natura 2000 areas: Only four Member States chose to designate ESPG outside Natura 2000 areas (CZ, LV, LU, UK-W). Of those only Wales was amongst the countries investigated for this report. Wales designated a further 53,718 hectares of pasture land as environmentally sensitive outside Natura 2000 areas. This area comprises land protected under national nature conservation legislation, where ploughing will be permitted only if it is necessary for protection of the habitat, and will require written consent.

Cross-compliance: The framework for standards of Good Agriculture and Environmental Condition (GAEC) has been restructured for 2014-2020. The main changes compared with the previous period are that all standards are now compulsory and the standards have been consolidated into a reduced list, with some of the previous standards becoming part of the greening measures. For example, the maintenance of permanent grassland is now a green measure, standards for crop rotations have been superseded by the crop diversification measure, and some of the content of soil standards in some countries, such as a requirement for catch crops and green cover has become incorporated into EFAs.

One GAEC standard has been slightly enhanced – GAEC7 for the protection of landscape features. This now includes an additional requirement to ban the cutting of hedges and trees during the bird breeding and rearing season and an optional element to place restrictions on invasive species.

A comparison of GAEC standards in place in Germany, Hungary, Spain and the UK in the previous and current period (the only countries for which information was available) showed that overall very little change has occurred in practice, with the main changes being a re-brigading of standards to fit with the new framework. In most countries, there have been some small changes made to soil standards. Where a ban on hedge cutting during the bird breeding season was not already in place, this has been brought in and where previous rules existed, the dates have been extended to cover the bird rearing season. Northern Ireland appears to be the only country reviewed that has included restrictions on invasive species into its GAEC standards, Hungary has added ponds to its list of landscape features and in Scotland a new rule has been introduced, preventing cultivation and pesticide use within 2m of the top of the bank along watercourses or from 2m of centre line of a hedge. In terms of what has disappeared, many of the previous standards preventing machinery use on waterlogged soils seem to have disappeared and in England, the requirement to establish a 2 metre margin from a hedge has been removed.

Pillar 2 Rural Development Programmes (RDPs): As noted above little information has been available in the public domain to assess changes in area based rural development schemes, such as the agri-environment scheme, as a result of the implementation of greening.

However, most Member States have experienced a reduction in their Pillar 2 budgets for the 2014-2020 period. About 43 per cent of funding has been allocated to priority 4, entitled 'Restoring, preserving and enhancing ecosystems related to agriculture and forestry', although only 16 per cent of funding is allocated to the AECM. A preliminary analysis of data available for the countries reviewed, indicates that most have significantly reduced their expenditure on agri-environment-climate and organic farming compared with 2007-13. Information provided by Member States about the targets set against various indicators, shows that 19% of EU farmland will be under biodiversity management by 2020, 15% under soil management, 15% under better water management and 7% under agreements to reduce GHG/ammonia. These estimated areas are likely to relate to the application of a number of measures, not just the agri-environment-climate measure.

Potential environmental implications

The new cross-compliance framework has not led to significant changes overall in the scope of environmental issues being addressed in the countries examined. However, the re-brigading of previous standards, within the new cross-compliance framework or within the greening measures affects several standards with consequences predominantly for the number of farms concerned. In cases where standards have been removed from cross-compliance completely and now apply only via the greening measures, the consequences are both positive and negative. Although GAEC standards apply across the whole farmed landscape, the extent to which they are adhered to in practice can be variable. The shift of some of these standards to greening means that (with the exception of the maintenance of permanent grassland) they will apply on a much smaller proportion of land and with

considerable variations between Member States. However, the fact that the requirements are related to a payment, with the more stringent controls that are associated with these, means that higher levels of compliance may occur in practice.

One of the original aspirations for introducing the greening measures under Pillar 1 was that this would free up resources within RDPs to focus on more targeted and 'deeper green' **agri-environment-climate measures** (AECM), releasing a proportion of the resources previously spent on 'broad and shallow' measures. Given the budget reductions for Pillar 2 overall and initial estimates that AECM expenditure has also decreased in many Member States, the hoped for uplift in environmental management of the wider farmed countryside seems unlikely to transpire, particularly on arable land. In some cases, where the EFA and crop diversification measures apply, there will be some resources freed up within agri-environment-climate schemes, given the need to avoid double funding. However, given the implementation choices reviewed, such savings are likely to be at the margins.

A detailed assessment is needed to compare the objectives and precise content of the AECM schemes being implemented from 2016 onwards with those that were in operation in 2007-13 to assess the implications of the new schemes and associated budgets.

In relation to the **greening measures**, due to the area threshold and range of exemptions that are in place for the EFA and crop diversification measures, the areas of arable land and numbers of farms affected are rather low in several countries. In Italy, up to 50 per cent of arable land is unaffected by the EFA measure and 72 per cent unaffected by the crop diversification measure. Proportions of between 20-40 per cent of land unaffected are common in other countries. The small size of farms in some Member States is the main reason for this. Permanent grassland is better protected as relatively few farmers are exempted.

In relation to the **crop diversification measure**, the introduction of greater diversity in cropping pattern could potentially lead to some benefits for biodiversity, particularly if it leads to an increase in crop rotation, and fallow or legume crops are introduced into the rotation. It is not known at this stage whether or not this will transpire in practice, although more N-fixing crops may be introduced, by farmers given that they can count towards both the EFA measure and the crop diversification measure and in many countries additional coupled support is available for these types of crops. The introduction of an equivalence measure that permits the continuation of a monoculture maize cropping system in France appears rather perverse, , and in conflict with the core objective of this measure, even if it is technically within the rules.

As originally conceived, **EFAs** were considered by many to be the greening measure with the greatest environmental impact. However, following protracted negotiations during the reform process, the eventual measure, has a much expanded list of permissible elements and long list of exemption criteria. Scepticism as to whether the measure will deliver much additional environmental benefit in practice, therefore has grown.

Although the potential environmental benefits, of the permitted practices are variable overall, on the land to which the EFA obligations apply, some beneficial impacts for

biodiversity, soil, water and climate could be anticipated. However, their exact impact will depend on the type, location and management of features by individual farms and the area of land subject to the requirements (i.e. not covered by exemptions from greening). The extent to which the options applied either lead to a change in management or alternatively, simply replicate activities that would have taken place even without the greening measure in place is a critical question. Actual impacts on the ground will take some time to discern.

It would appear that most countries have not implemented the EFA measure in a way that would maximise its environmental benefits. Instead the implementation choices tend to maximise opportunities to maintain the agricultural status quo by permitting those elements which allow continued production (e.g. establishing N-fixing crops), often including crops that are of limited environmental value whilst also permitting fertiliser and plant protection products to be used. Where landscape features, buffer strips and terraces are included they are mainly those that are protected already under cross-compliance. Given this tendency in most countries, it is unlikely that the EFA measure will deliver significant additional environmental benefits overall.

However, there are some instances of positive implementation choices having been made. For example, Germany has restricted the use of strips along forest edges to those without production and is the only country for which information was available that appears to have restricted the use of fertilisers and pesticides on catch crops and cover crops. The Netherlands has restricted the use of fertilisers on N-fixing crops (the only country that appears to do so) and Spain and Germany have put in place conditions on the crops that must follow N-fixing crops to prevent nitrogen leaching. France, Scotland and Wales are the only countries to have restricted EFA landscape features to those that are additional to cross-compliance and England. Scotland appears to be the only country to have allowed wild flower and wild bird seed to be sown on the buffer strips.

The most widespread change likely to be brought about via the EFA measure, is an increase in the use of nitrogen fixing crops, particularly in areas with good growing conditions. Planting also will be boosted by the fact that these crops can also count towards the crop diversification greening measure and because most countries have introduced voluntary coupled support payments for protein crops.

In relation to the **maintenance of permanent grassland**, the designation of ESPG, both within and outside Natura 2000 areas, is likely to bring some additional environmental benefits for biodiversity, carbon, soil and water - given the ban on ploughing (although for the most part ploughing should already have been prevented via the application of the birds and habitats Directives). The actual impact will depend on the proportion of land designated and the extent to which its inclusion under greening leads to greater adherence to the rules by farmers. Where more additionality may be seen is on sensitive grasslands designated outside the Natura 2000 network, although in the case of Wales this covers sites that were already protected via national legislation.

If the ratio of permanent grassland is maintained, at the regional level, this should improve the chances of slowing the rate of decline in those regions where it is most at risk, However, where the ratio is maintained nationally, as in most countries surveyed here significant

declines in specific key areas can be masked. However, the rules do not exclude the ploughing of species-rich grassland, unless designated as ESPG.

The type and level of permanent grassland reductions that take place in practice will also be affected by the nature of the authorisation systems put in place to determine when permanent grassland can be converted. For example, in Germany all farmers wishing to convert any permanent grassland must receive prior approval, with a requirement that any declines must be compensated by increases in permanent grassland elsewhere. This is likely to constrain permanent grassland decline far more than in those countries where action is only taken once the five per cent threshold is reached.

In summary, the flexibility available to national authorities for implementing the greening measures, particularly in the EFA measure, but also the permanent grassland measure, in principle creates opportunities to tailor the greening measures to deliver a basic level of environmental benefit across the farmed countryside and also to provide a solid foundation on which agri-environment-climate schemes under Pillar 2 could build. However, the options available do not appear to have been used in this way. Rather the general pattern in most of the Member States reviewed has been to offer farmers maximum flexibility in terms of implementation. This means that there is a very high likelihood that those farmers who are not exempt from greening, will be able to meet the requirements with very few changes in established management.

It has been estimated that the actual area of arable land that will be subject to EFA requirements once the exemption and weighting system have been taken into account, will amount to no more than one to two per cent of arable land. Given this and the fact that the majority of implementation decisions, not just for the EFA measure, but the other measures too, do not appear to be likely to deliver significant additional environmental benefits, questions must be raised about the value for money of the €12.5 billion per year of expenditure on the greening measures.

1 Introduction

1.1 Aim of the study

This report forms part of the study entitled 'Evaluation of the Common Agricultural Policy (CAP) greening and its impacts post 2013: will some environmental outcomes materialize in our farmland?', commissioned by the European Environmental Bureau. It has been undertaken by the Institute for Agroecology and Biodiversity (IFAB) in collaboration with the Institute for European Environmental Policy (IEEP).

The most recent reform of the CAP, agreed in December 2013 and mostly implemented in Member States from 2015, provided Member States with considerable flexibility regarding the implementation of various elements of Pillar 1 direct support, including the new green direct payments. As a result, there is the potential for considerable variability in the way Member States can implement the greening measures and in addition, many of the measures adopted by Member States provide farmers with a range of choices about what actions they may adopt on their farms. These decisions, by Member States and farmers, will affect the potential for achieving desired environmental impacts on the ground as a result of better practices. There was a declared aim to achieve environmental benefits from the greening measures to contribute to the CAP objective of 'the sustainable management of natural resources and climate action'. However whether and how far environmental benefits are attained in practice will depend not just on what measures within the permitted spectrum are pursued by national authorities, but also how these are implemented on farmland (i.e. particularly in conjunction with cross-compliance and agri-environment-climate and other area based rural development measures), the spatial location of the measures within both a single field and the wider farmed landscape, as well as whether or not they lead to a change in management practices on the farm.

The focus of this report is to set out the implementation decisions taken by nine Member States within the spectrum permitted for the three principal greening measures, namely for crop diversification, the maintenance of permanent grassland and ecological focus areas (EFAs) in 2015. It then goes on to provide a preliminary view of the potential that these decisions have for delivering improved environmental management on farmland. The countries investigated are: France, Germany, Italy, Hungary, the Netherlands, Poland, Romania, Spain and the UK (all four regions).

Member States can amend a number of their implementation decisions every year, and some may well do so after 2015, which is the first year of implementation. This report provides a snapshot of information for nine Member States for 2015 only and then further work to track and analyse the pattern of implementation in this relatively complex area will be required in future years.

In attempting to assess the extent to which the greening measures might deliver additional environmental benefits, compared to the situation under the previous CAP, the implementation of the green direct payments cannot be seen in isolation. It is also important to understand how the implementation of the greening measures interacts with what environmental management is required of farmers under cross-compliance and Pillar 2

area payments operating on farmland, particularly the agri-environment measure. The report seeks to examine changes in the cross-compliance framework in the nine Member States and the interaction of this revised framework with the greening measures. However, it has been more difficult to assess the interactions of the greening measures with the agri-environment climate measure, i.e. voluntary agri-environmental payment schemes for farmers which vary significantly between countries and in some cases between regions. This is because rural development programmes for 2015 onwards had not been approved by the Commission or initiated at the time of this study and the detailed information required to carry out the assessment was not in the public domain.

Information for this study was gathered via questionnaires to Member State experts in the nine countries examined during winter 2014 and spring 2015. This was supplemented by data made publicly available by DG Agriculture on its website[1] as well as literature on the potential environmental implications of the greening measures. It has proved easier to access information in some countries than others. At the time when data were collected, many of the decisions made by Member States had yet to be made publicly available, often due to the fact that there was ongoing dialogue with the European Commission about some of the details. In addition, as mentioned above, the actual environmental impact of the greening measures depends on a range of very location specific factors.

The role of this report, therefore, is simply to point towards some of the strengths and weaknesses of the approaches taken in Member States from an environmental perspective. A parallel assessment of the actual situation at field level has been carried out in 39 regions in ten countries to provide a baseline assessment of the situation on the ground, against which follow up field work can assess the extent to which the implementation of the greening measures has led to any environmental additionality or visible changes to the landscapes that are relevant for the environment. This is available as a separate report (IFAB, 2015[2]).

1.2 Overview of green direct payments and their interaction with other environmentally focused CAP mechanisms

Within the new Pillar One of the CAP there are three main measures providing farmers with 'payments for agricultural practices beneficial for the climate and the environment, otherwise know as 'green direct payments' or 'greening'[3]. These are:

- crop diversification;
- the maintenance of permanent grassland; and
- Ecological Focus areas (EFA).

[1] In particular the following information note was used to cross-check the accuracy of the data: European Commission (2015), Direct payments post 2014- Decisions taken by Member States by 1 August 2014 - State of play on 07.05.2015, Information note, published 28 May 2015.

[2] Ifab, 2015, Landscape Infrastructure and Sustainable Agriculture (LISA), Report on the investigations 2014

[3] Article 43 of Regulation (EU) 1307/2013 of the European Parliament and of the Council of 17 December 2013 establishing rules for direct payments to farmers under support schemes within the framework of the common agricultural policy and repealing Council Regulation (EC) No 637/2008 and Council Regulation (EC) No 73/2009.

Details of the EU rules applying to each of these measures, including eligibility criteria and exemptions applying to farmers are set out in Annex 1. The new architecture of the "green" component of the revised CAP is set out in Figure 1.

These greening measures account for 30 per cent of direct payments to farmers in Pillar One, about €75 billion over six years. Member State authorities are free to choose from a number of options in the way in which these greening payments are implemented. They can simply adopt "standard" versions of the three measures, the esential rules of which are set out in the CAP regulations. Or they can opt for 'equivalent practices', which are 'similar practices which yield an equivalent or higher level of benefit for the climate and the environment' (Article 43(3)). All decisions on the implementation of greening must be notified to the European Commission, but only the use of equivalent practices is subject to approval by the Commission before being rolled out to farmers.

Of the three "standard" greening measures, the EFA measure has the most flexibility, in terms of how MS can choose to put it into practice. There are as many as ten potential land management options that Member States can choose to make available to farmers to fulfil their EFA obligation on the ground; together they need to amount to five per cent of the relevant area (arable land). This increases to 19 options if the nine different types of landscape features permitted (e.g. hedges) are taken into account. There is another layer of options that can be exercised by Member States designing their EFA regimes. They can also choose to implement up to half the area affected by the EFA obligation at a regional level in order to obtain adjacent ecological focus areas (Article 46(5), or choose a collective model rather than obligating individual farmers, provided that the ecological focus areas concerned are contiguous (Article 46(6).

The second greening measure on the maintenance of permanent grassland also provides Member States with a number of options for complying with the obligations set out in CAP legislation. Firstly they can determine the level at which to apply the mandatory requirement to maintain the ratio of permanent grassland to total agricultural area (i.e. national, regional, local). Secondly they have choices relating to the proportion of permanent grassland within Natura 2000 areas to designate as "environmentally sensitive" and whether or not to designate further environmental sensitive permanent grassland (ESPG) outside Natura 2000 areas (see Annex 1 for an explanation of these rules).

The crop diversification measure does not have any such variants.

Member States also have the option of applying a series of weighting and conversion factors to each of the management practices they decide will be available for farmers to use. The weighting factors reflect the different ecological value of the various EFA practices and features. The application of these factors affects the area needed under different practices to meet the five per cent EFA requirement. The use of weighting factors is mandatory for any element of an EFA, with a weighting of less than one. All other conversion and weighting factors are optional.

As noted above Member States have a choice between adopting "standard" greening measures set out in the EU legislation or developing their own "equivalent" measures,

which must comply with the rules in Regulation EU 1307/2013. Equivalent practices can be implemented in two ways:

- First, through offering 'equivalent practices' as part of commitments undertaken by farmers in accordance with agri-environment-climate measures[4] in rural development programmes. Equivalent practices are '…those which include similar practices that yield an equivalent or higher level of benefit for the climate and the environment' compared to the standard greening practices (Article 43 (3) of Regulation 1307/2013) and are limited to those set out in Annex IX of the Regulation (see Table 13 in Annex 1); and
- Second, through national or regional certification schemes, which must go beyond cross compliance requirements[5]. Where a certification scheme is used as a means of delivering the greening requirements, such a scheme could include the standard green practices, the equivalent practices or a combination of both.

All 28 Member States have put in place the standard three greening practices. However, five will also allow greening by equivalence (FR, NL, AT, PL, IE). Only the Netherlands and Poland have chosen to make use of the flexibility to implement EFAs collectively and none are taking a regional approach to implementation; all are national.

Of the five Member States which have chosen to allow greening by equivalence, two have allowed the implementation of equivalent practices via certification schemes - France (for crop diversification) and the Netherlands (for EFAs)[6]. The remaining three Member States have introduced equivalent measures into their agri-environment-climate schemes – Ireland and Poland just for crop diversification and Austria for both crop diversification and the EFA measure. The equivalence options chosen by the countries reviewed for this study are explained in the relevant sections of the report.

The greening element of Pillar 1 is only one of the CAP policy instruments designed to improve the environmental performance of the agricultural sector. It works in combination with, *inter alia,* cross-compliance requirements and a number of the measures contained within regional rural development programmes, particularly the agri-environment-climate measure. Supporting measures, in Pillar 2, such as the Farm Advisory System are also important (see Figure 1). Under the reformed CAP, the cross-compliance standards have been simplified, with some of the previous requirements moving to different parts of the CAP[7], particularly the greening provisions (for example the rules on the maintenance of permanent grassland and certain aspects of the soil requirements within the EFA measure).

Rural Development policy remains a key means of achieving environmental outcomes on agricultural land. Of the six priorities applying to rural development programmes throughout the EU, priority 4 is focussed on biodiversity, water and soil protection and

[4] Those operating under both Article 39(2) of Regulation No 1698/2005 (agri environment payments) or Article 28(2) of Regulation (EC) No 1305/2013 (agri environment climate payments).

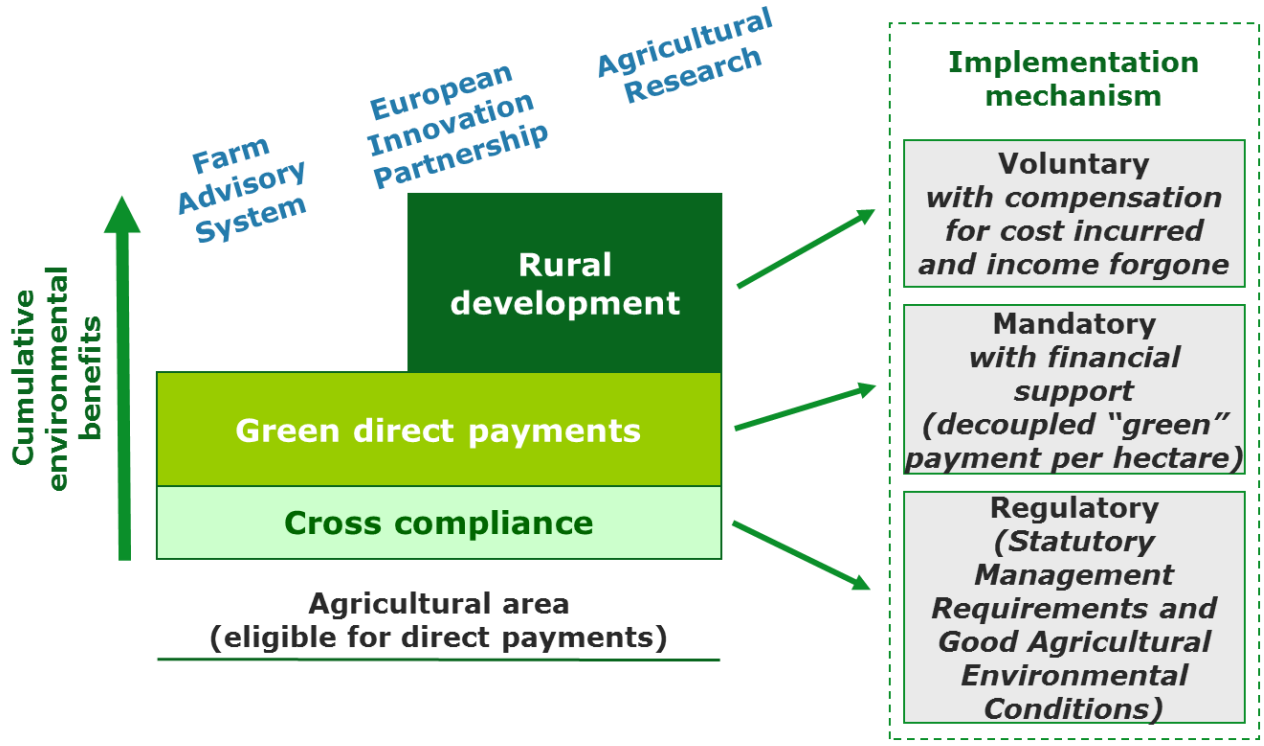
[5] As set out in Chapter I of Title VI of the Horizontal Regulation

[6] It should be noted that these equivalent schemes cover all three greening measures, where equivalent practices are not applied, then the standard greening measures and associated rules apply.

[7] For example minimum levels of agricultural activity are now included under basic payment eligibility criteria under Article 5(2) of Regulation (EU) 1307/2013

enhancement and priority 5 is to encourage a shift towards a low carbon economy. Given the potential overlap in "green" measures in the two pillars of the CAP it has also been necessary to put in place rules to prevent the double funding of environmentally beneficial agricultural practices via both the greening measures and the agri-environment-climate.

Figure 1: New architecture of the "green" components of the revised CAP



Source: European Commission, 2013[8]

[8] European Commission (2013) Overview of CAP Reform 2014-2020, Agricultural Policy Perspectives Brief N°5*, December 2013

2 Ecological Focus Areas

The EFA measure requires that holdings with more than 15 hectares of arable land must maintain at least five per cent of this arable land an ecological focus area, as defined in the legislation. Member States are given considerable flexibility in deciding what constitutes an EFA. They can choose which of a suite of ten forms of land management or features to allow in their countries to fulfil farmers' EFA obligations. These are:

- Land lying fallow;
- Terraces;
- Landscape features, including those adjacent to the arable land of the holding but not included in the eligible area;
- Buffer strips, including buffer strips covered by permanent grassland provided these are distinct from adjacent eligible agricultural areas;
- Areas of agro-forestry that receive support under the forestry measures within rural development programmes or that have received support under these programmes ;
- Strips of eligible hectares along forest edges (with or without production);
- Areas with short rotation coppice with no use of mineral fertilizer and/or plant protection products;
- Previously afforested areas which are still eligible for direct payments;
- Areas with catch crops, or green cover established by the planting and germination of seeds;
- Areas with nitrogen fixing crops.

The stated objective of the EFA measure is: 'to safeguard and improve biodiversity on farms' (recital 44 of Regulation (EU) 1307/2013). The choice of options needs to be considered in this light, leaving in mind that many of the EFA elements listed in the Regulation could have benefits for soil and water related ecosystem services.

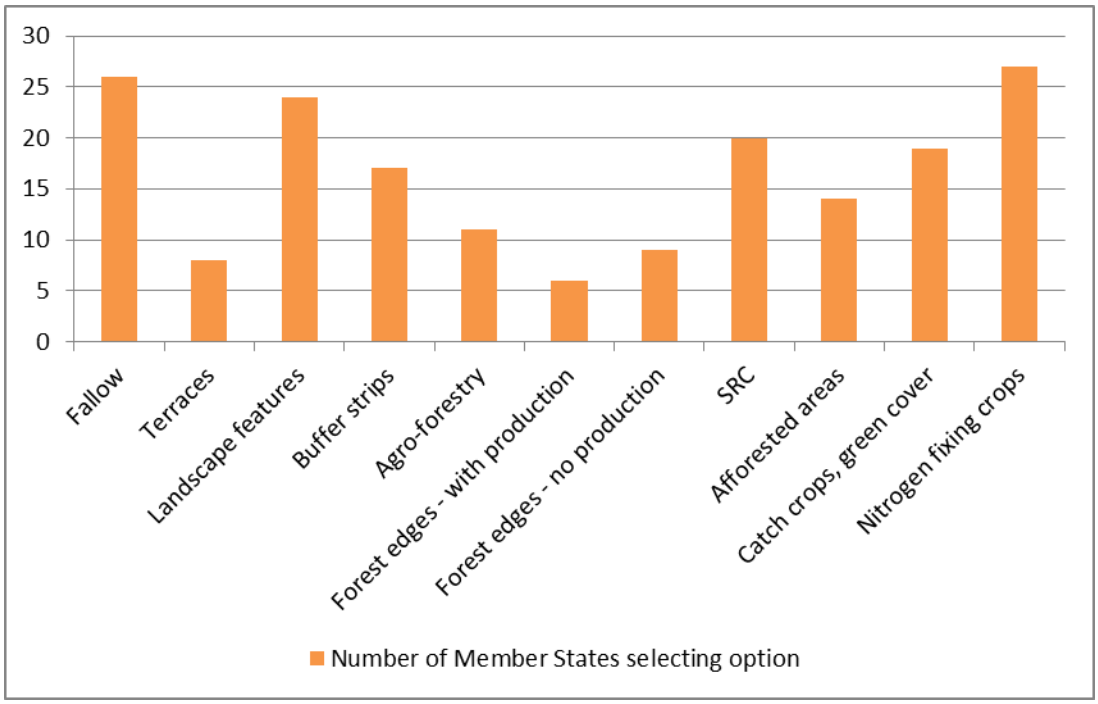
2.1 Member State implementation choices

The sections below set out which of the EFA elements Member States have chosen to include nationally as eligible to fulfil farmers' EFA obligations. In each case a broad overview is provided for the EU-28 and the nine countries that are the focus of this study. This is followed by a review of the detailed requirements put in place for each of the EFA elements, focussing on the nine Member States and a brief commentary on the potential environmental implications of these implementation decisions.

2.1.1 Overview

For the EU-28, the most popular EFA elements, chosen by more than two-thirds of Member States, are areas with nitrogen fixing crops (27 MSs – all except Denmark), followed by land lying fallow (26); landscape features (24 – all but Spain, Cyprus, Lithuania and Slovenia); areas with short rotation coppice (20 – all but Greece, Spain, Cyprus, Latvia, Lithuania, Malta, Portugal and Slovenia, as well as England and Scotland in the UK); and areas with catch crops or green cover (19 – all but Estonia, Greece, Spain, Italy, Cyprus, Lithuania, Malta, Portugal, Finland as well as Northern Ireland and Wales in the UK) – see Figure 2.

Figure 2: Selection by Member States of elements qualifying for EFA (EU-28)



Source: created from data in European Commission (2015)

Rather similar choices have been made in the nine Member States investigated for this study, as shown in Table 1. France, Germany and Hungary have chosen to implement all EFA elements that are available, with Italy opting for all but catch crops and green cover. The Netherlands and Spain are the two countries reviewed for this study that have chosen to allow the least number of elements to farmers to fulfil their EFA obligations (four each) and the UK regions have also limited the options available. The reasons for choosing a limited rather than full range of options are varied and include:

- the fact that the management practice or feature does not occur in the country in question (e.g. terraces);
- where no funding has been provided in either past or current RDPs for those options that are only permissible if the practice has been supported previously via rural development funding (e.g. agro-forestry, afforestation);
- where the element is already covered by cross-compliance and no further action is deemed necessary via greening; and/or
- Where an option is not considered sufficiently beneficial environmentally (whether generally or in a national context) to meet EFA objectives.
- Where implementation may pose difficulties in relation to the control and verification of actions – for example where certain features are not easily mapped and therefore their identification is problematic and could increase the risk of disallowance.

Information on each of the options is provided in the sections that follow.

Table 1: EFA implementation choices in selected Member States

MS	Fallow	Terraces	L'scape features	Buffer strips	Agro-forestry	Forest edges	SRC	Afforested areas	Catch crops, green cover	N fixing crops	Total
FR	Y	y	y	y	Y	Y	Y	Y	Y	Y	10
DE	Y	y	Y	Y	y	y	Y	Y	Y	Y	10
HU	Y	Y	y	y	y	y	y	y	y	y	10
IT	y	y	y	y	y	y	y	y		y	9
NL			Y				y		Y	Y	4
PL	y		y	y		y	y	y	y	y	8
RO		y	Y	Y			Y	Y	y	Y	7
ES	Y				Y			Y		Y	4
UK E	Y		Y	Y					Y	Y	5
UK NI	Y		Y		Y		Y	Y		Y	6
UK S	Y		Y	Y					Y	Y	5
UK W	Y		Y				Y	Y		Y	5
Total MSs	7	5	8	7	6	5	8	8	7	9	

2.1.2 Land lying fallow

General rules

The key rule defining fallow land that qualifies to count towards an EFA is that there must be no production on this land. If land is continuously fallow for more than five years for the purposes of fulfilling EFA obligations, it remains classified as arable land[9] (Article 45 of Commission Delegated Regulation (EU) 639/2014).

Implementation

Twenty-six Member States chose land lying fallow as an EFA option, making it the second most popular option after nitrogen fixing crops. The only two countries not to choose fallow are the Netherlands and Romania.

Land lying fallow is eligible to fulfil EFA obligations in seven of the nine Member States reviewed and in all of the UK regions (not the Netherlands or Romania). The rules that Member States have set for this land vary considerably, at least for the regions/countries where information was available.

For example the timescale over which fallow must be in situ is different for every Member States and region, not very surprising given variations in local cropping conditions. For example:

- Germany - there must be no agricultural use until 31 July;
- Hungary – land must be fallow from 1 January – 30 September;
- Italy - fallow must be in place for at least seven months;
- Spain - fallow must be in place for at least nine months from the date of the previous harvest (between October and August the following year);
- UK (England) - no crops permitted from 1 January - 30 June;

[9] As a derogation from Article 4(1)(h) of Regulation (EU) No 1307/2013, which sets out the definition of permanent grassland.

- UK (Northern Ireland) – no crops permitted from 1 February – 31 July;
- UK (Scotland) – no crops permitted from 15 January – 15 July;
- UK (Wales) – land must be fallow for at least six months.

There are also differing rules on the activities that are permitted on the land and are considered compatible with the 'no production' rule. For example:

- Hungary - fallow areas can be grazed and cut to ensure they are kept in good condition;
- UK (England) - temporary grass counts as fallow as long as no grass seed is sown, whereas wild bird seed mixes and nectar sources also count and these can be sown (at least two crops must be grown);
- UK (Northern Ireland) – grass and green cover count as fallow and grass can be cut but not removed during the fallow period. In addition wild bird cover seed mix can be counted as fallow as long as it is not harvested or grazed.
- UK (Scotland) - Wild flower mixes, wild bird seed mixes and grass are permitted on fallow areas but no topping is permitted. Unusually, Scotland specifies that basal fertiliser is permitted to support the growth of ground cover.
- UK (Wales) - Unharvestable seed mixes for wildlife and pollinators are permitted and must include at least two crops.

The minimum area and sometimes width are also specified. In the information sourced for this study, the minimum area ranges from 0.01 ha (UK – NI, Scot, Wales) to 0.25ha in Hungary. The minimum width of the patch of land considered was specified only in the UK (Eng, NI, Wales) and the figure was two metres for all regions.

Fallow land is a valuable aspect of farm management, benefitting biodiversity, helping protect soil and water resources as well as having the potential for carbon sequestration. However, the benefits do depend on whether or not the land is put down to fallow permanently (i.e. in the same place for multiple years) or is rotational (i.e. moves around the farm each year). Permanent fallow can reduce losses of phosphorous, sediment and reduce nitrate leaching (if positioned in the right location on the farm) as well as help sequester carbon in the soil (Newell Price et al. 2008[10]; Hodge et al, 2006[11]; European Climate Change Programme 2003[12]). For biodiversity, rotational fallow tends to be more beneficial, providing winter food for seed-eating birds, summer insect food for chicks (British Trust for Ornithology 2009), nesting habitat for ground nesting species as well as many other plants, mammals and insects that use these areas (Boatman et al. 2008; IEEP, 2008).

The fact that wildflower seed mixes, wild bird seed mixes and nectar sources can be sown on 'land lying fallow' counting towards the EFA obligation in the UK is therefore particularly

[10] Newell Price, J.P., Chambers, B., Twining, S., Lord, E., Gooday, R. (2008). *Assessing the resource protection impacts of a zero% rate of set-aside*. Final report to Defra and Environment Agency. ADAS Mansfield

[11] Hodge, I, Reader, M, Revoredo, C, Crabtree, B, Tucker, G and King, T (2006) Project to assess future options for set-aside. Final Report for the Department for Environment, Food and Rural Affairs. Cambridge: University of Cambridge, Department of Land Economy.

[12] European Climate Change Programme (2003). *Final report of the Working Group on Sinks Related to Agricultural Soils*

welcome from a biodiversity perspective. Its impact will depend, of course, on the extent to which farmers choose this option in practice, the proportion of arable land that is put under fallow as a result and whether or not this leads to additional areas being placed under fallow, over and above what otherwise would have been the case.

2.1.3 Terraces

General rules
For the purposes of an EFA, terraces must include those identified under cross-compliance (GAEC7) and can also include other terraces as permitted under Article 45 of Commission Delegated Regulation (EU) 639/2014. If terraces additional to those protected under GAEC7 are chosen then it is up to the Member State to define criteria for these to reflect local or regional characteristics. These criteria must include a minimum height.

Implementation
Five of the nine countries reviewed for this study chose terraces to be eligible for meeting the EFA obligation (DE, FR, IT, HU, RO). At the EU-28 level, only eight chose this element (additionally BG, CZ and SK). From the information available, Germany has chosen only to include those terraces protected under cross-compliance. Information on the criteria identified for 'other' terraces was only accessible for Hungary and Romania, where the minimum height stipulated was 1 metre.

2.1.4 Landscape features

General rules
Eligible landscape features must be 'at the disposal' of the farmer and can be adjacent to the arable land, even if not in the eligible area (Article 46(2)(c) of Regulation (EU) 1307/2013).

Features can be those protected under cross-compliance (GAEC7) or those from a wider list of nine types of landscape features specified in Article 45 of Commission Delegated Regulation (EU) 639/2014) or a combination of both. The dimensions of the landscape features permitted differ, depending on whether they are defined under GAEC7 or Article 45. For example, under GAEC7, hedges or wooded strips can have a maximum width of 2 metres and ditches a maximum width of 2- 12 metres. For landscape features specified under Article 45, the following dimensions apply:

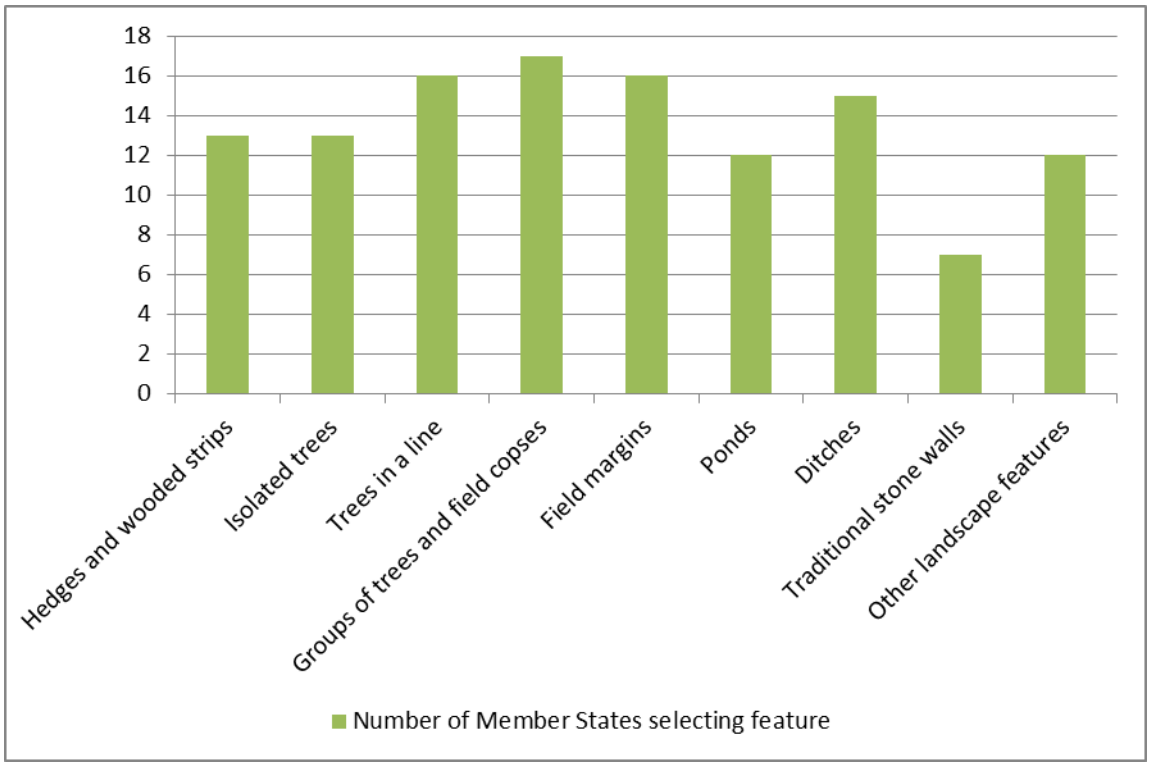
- *Hedges or wooded strips* - maximum width of 10 m (gaps can be a maximum of 2m).
- *Isolated trees* - crown diameter of a minimum of 4 m (however, Member States can include trees with a smaller crown diameter if they are recognised as valuable landscape features in that country).
- *Trees in line* - crown diameter of minimum 4m, with the space between the crowns not exceeding 5m (trees with a smaller crown diameter are permitted for the same reason as for isolated trees).
- *Trees in a group (i.e. overlapping crown cover) and field copses* – the maximum area covered cannot exceed 0.3 ha.

- *Field margins* – no agricultural production is permitted on field margins and their width can be between 1-20m and Member States can establish a lower maximum width.
- *Ponds* – maximum size is 0.1 ha. Member States can define a minimum size; can decide to include a strip of riparian vegetation alongside the pond up to 10m in width to count within the size of the pond; and can establish criteria to ensure ponds are of natural value 'taking into account the role that natural ponds play for the conservation of habitats and species'. Concrete or plastic reservoirs cannot count towards an EFA.
- *Ditches* - maximum width of 6m. Open watercourses for the purpose of irrigation or drainage can count, but channels with walls made of concrete are not eligible.
- *Traditional stone walls* – the height and width of these features must be defined by the Member State, based on national or regional characteristics.

Implementation

Figures for the EU-28 show that, where Member States allow landscape features to count towards an EFA, the number of landscape features chosen range from one in NL, PT, FI, SE and the UK (England and Scotland) to the maximum nine (in Italy). A further eight Member States opted for eight (DE, FR, HU) or seven (BE–Wa, BG, HR, PL, RO) landscape features. The most popular types of landscape features are trees in groups/field copses (17 MSs), trees in a line (16), field margins (16) and ditches (15).

Figure 3: Types of landscape feature chosen as eligible for EFAs by Member States (EU-28)



Source: European Commission, 2015

Amongst the nine countries examined for this study, all but Spain included landscape features as eligible to count towards the EFA. In the Netherlands and the UK (England and Scotland) only one landscape feature can be used to fulfil the EFA obligation (field margins

in the NL and UK(Sc) and hedgerows in the UK(Eng)). In contrast, IT has allowed all nine landscape features to count, with another five of the eight countries permitting either seven (PL and RO) or eight features (FR, DE, HU).

The most popular types of landscape features chosen in the nine countries were slightly different from the EU-28, as a whole, with field margins the most popular (all countries – although not all regions in the UK), followed by ditches and hedges (7 countries, with varying combinations in UK regions). Isolated trees, trees in a line and groups of trees were chosen in six countries each, with ponds chosen by five countries and traditional stone walls and other landscape features chosen by four countries each (see Table 2

Table 2).

Most countries reviewed have opted to include some features as defined under cross-compliance, some features as specified under Article 45 of the delegated act for direct payments and some features where both definitions are valid. Of these eight countries, only France, the Netherlands and the UK (Wales and Scotland) have chosen not to include any landscape features covered by cross-compliance. In contrast, the UK (England and Northern Ireland) have included only landscape features as protected under cross-compliance (GAEC7). Germany opted also for mainly landscape features protected under GAEC7, apart from field margins, where Article 45 requirements also apply.

For those countries investigated that chose to allow 'other landscape features' to count towards an EFA, these relate to protected ancient monuments (Cumanian mounds – shadoofs in Hungary), protected archaeological sites (UK – Northern Ireland) and 'wetlands, ponds and biotopes' in Germany.

In relation to the EU provisions identified in Article 45, where there is flexibility, for Member States the following rules have been applied by their competent authorities:

- Hedgerows – minimum lengths are identified in the UK of 20 metres (Eng) and 5 metres (NI) – both as defined under GAEC7 - and 20 metres in Wales (under Art. 45);
- Trees in a line – Italy has identified two tree species as valuable landscape features, whose crown diameter can be smaller than the standard 4metres – cypress and black poplar;
- Field margins – in Hungary it is specified that these must consist of at least 50% herbaceous vegetation, whereas in the UK (Scot) wild flower mixes, wild bird seed mixes and grass sward are permitted on the margins;
- Ponds – Hungary has taken the option to include up to 10 metres of riparian vegetation within its definition of a pond;
- The dimensions of traditional stone walls have been provided for a number of Member States:
    - France: height = 0.5-2m / width = 0.1-2m;
    - Italy (as per cross-compliance) – minimum length of 10 metres
    - UK (Northern Ireland) – as per cross-compliance: height = 0.5m - 2.30m/ width: 0.25m - 4m;
    - UK (Wales): Min length = 20 m. Minimum height = 1m / Maximum width = 4m.

Table 2: Landscape features chosen in nine Member State

Landscape feature	FR	DE	HU	IT	NL	PL	RO	UK E	UK NI	UK S	UK W	Total
Hedges and wooded strips	Art.45	GAEC7	Art.45	GAEC7 SMR2 SMR 3		Art.45	Art.45	GAEC7	GAEC7		Art.45	7
Isolated trees	Art.45	GAEC7	Art.45 GAEC7	GAEC7 SMR2 SMR 3		Art.45 GAEC 7	Art.45					6
Trees in a line	Art.45	GAEC7	Art.45	GAEC7 SMR2 SMR3		Art.45	Art.45					6
Groups of trees and field copses	Art.45	GAEC7	GAEC 7	Art.45		Art.45	Art.45					6
Field margins	Art.45	Art.45 GAEC7	Art.45	Art.45	Art.45	Art.45	Art.45			Art.45		8
Ponds	Art.45		GAEC7	GAEC7 SMR2 SMR 3		Art.45G AEC 7	Art.45					5
Ditches	Art.45	GAEC7	Art.45	GAEC7 SMR2 SMR 3		Art.45 GAEC 7	Art.45		GAEC7			7
Traditional stone walls	Art.45	GAEC7		GAEC 7 SMR2 SMR3					GAEC7		Art.45	4
Other l'scape features		GAEC7	GAEC7	unclear					GAEC7			4
Totals	8	8	8	9	1	7	7	1	4	1	2	

The protection of landscape features is beneficial, particularly for biodiversity and landscape reasons. However, they can also play an important role in protecting soils and watercourses, if located correctly, by preventing soil run-off, for example. They can also have a beneficial climate impact, for example through carbon sequestration in the woody growth of hedges and trees and by helping to mitigate against flood events (Hjerp *et al*, 2012)[13]. From a biodiversity perspective, the hedgerows and trees in particular can provide a valuable food resource and nesting habitat for birds as well as pollen and nectar sources and overwintering habitats for invertebrates. Their biodiversity value, however, will be influenced by the way in which they are managed. Ponds and ditches can also provide important wildlife habitats if managed appropriately. Many of these features are also important from a landscape perspective, reflecting the history and character of the local area.

The extent of environmental benefits deriving from the inclusion of landscape features within EFAs will depend on two factors:

a. the extent to which farmers choose to include the eligible features within their EFA, which is as yet unknown; and

[13] Hjerp, P., Volkery, A., Lückge, H., Medhurst, J., Hart, K., Medarova-Bergstrom, K., Tröltzsch, J., McGuinn, J., Skinner, I., Desbarats, J., Slater, C., Bartel, A., Frelih-Larsen, A., and ten Brink, P., (forthcoming), Methodologies for Climate Proofing Investments and Measures under Cohesion and Regional Policy and the Common Agricultural Policy, A report for DG Climate, August 2012.

b. where the eligible features are those already protected under cross-compliance, the extent to which their inclusion within the EFA provides a greater incentive to maintain them than would otherwise be the case;

2.1.5 Buffer strips

General rules

Buffer strips eligible to count towards an EFA include those covered by permanent grassland provided these are distinct from the adjacent eligible agricultural area. Member States must include those buffer strips alongside water courses, which are protected under GAEC1, SMR1 or SMR10 and can also include other buffer strips as set out in Article 45 of Commission Delegated Regulation (EU) 639/2014). The Article 45 rules state that:

- The minimum width of 'other' buffer strips can be set by the Member State, but must not be below 1 metre;
- There must be no production on the buffer strip, although grazing or cutting is permitted, provided that the buffer strip remains distinguishable from adjacent agricultural land;
- They must be located on or adjacent to an arable field, with the long edge parallel to the edge of a water course/water body; and
- Where they are along water courses, they can include strips of riparian vegetation up to a maximum width of 10 metres.

Implementation

In the EU-28, 17 Member States chose to include buffer strips as being eligible to contribute to EFAs, of which 10 permitted 'other buffer strips' as well as those required under cross-compliance (European Commission, 2015). Amongst the nine countries reviewed for this study, only the Netherlands and Spain did not choose this option, as well as Northern Ireland and Wales in the UK. Of the seven countries that did choose buffer strips, four (DE, FR, PL and UK (Eng and Scot) chose to include 'other buffer strips' alongside those covered by cross-compliance. There is a great variation in the choices relating to widths and whether or not to include a strip of riparian vegetation under the cross-compliance option, as set out in Table 3.

Table 3: Buffer strip implementation choices in nine Member States

	FR	DE	HU	IT	PL	RO	UK-E	UK-S
Cross-compliance (GAEC1/SMR1/SMR10)	GAEC1	GAEC1 SMR1	GAEC1 SMR1 SMR10	GAEC1 SMR1 SMR10	GAEC1	GAEC1 SMR1 SMR10	GAEC1	GAEC1 SMR1 SMR10
Width	5-10m	1-20m	Varies	1-5m	Min 5m	1-5m (GAEC) 1-50m (SMRs)	Min 1m	Min 10m
Riparian Vegetation permitted?	Yes	No	No	Yes	No	Yes	Yes	Yes
Grazing/cutting permitted?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Use of fertilisers/pesticides?	Not stated	Not stated	Not stated	Not stated	Not allowed (specific rules)	National legislation applies	Not stated	Organic fertilisers not allowed
Other buffer strips	X	X			X		X	X
Width	5-10m	1-20 m			1-10m		Min 1m	2-20m
Grazing/cutting permitted?	Yes	Yes			Yes		Yes	Yes
Use of fertilisers/pesticides?	Not stated	Not stated			Not stated		Not stated	Not stated
Other		Can be prepared for agric use from 1 August if to be used for harvest in next year					Sowing wild bird seed mixes / nectar sources permitted on in-field buffer strips parallel to water-courses	Wild flower mixes, wild bird seed mixes & grass sward permitted Grass within a buffer strip can be cut & removed (including for silage and hay) but must be sympathetic to ground nesting birds by avoiding nesting periods

Source: European Commission (2015) and questionnaire responses from case study experts.

Buffer strips can be beneficial for biodiversity and can play a role in protecting soil and water quality. However, their value is very dependent on where they are located in the field and how they are managed (Dicks *et al,* 2013[14]). Those buffer strips that are beneficial for protecting water courses from soil runoff are generally not beneficial from a biodiversity perspective as they will be too nutrient rich to be botanically diverse (Critchley, 2013[15]). Buffer strips can provide habitat for small mammals and overwintering sites for beneficial insects and if wild bird seed mixes / nectar sources are sown, then they can provide a useful food source for birds and invertebrates, including pollinators (Clarke *et al.* 2007[16]). However, to provide optimal benefit for farmland wildlife (providing both winter and summer resources), a diversity of margins is required at the farm scale, e.g. both tall grass margins and those sown with a wildflower seed mix (Heard *et al*, 2012[17]).

Where only those buffer strips that are already protected under cross-compliance are included (e.g. HU, IT, RO) then the additional environmental benefit of including these within an EFA will be limited, unless the fact of their being part of the EFA leads to greater compliance with the stated requirements. For 'other' buffer strips, the environmental benefit will depend on the number of farmers that choose these options, the siting and the management of the buffer strip. The options in the UK (England and Scotland) to allow wild bird mix/nectar mixes to be sown on the buffer strip are likely to be positive for biodiversity.

2.1.6 Areas of agro-forestry and afforested areas which are still eligible for direct payments

General rules

To be eligible to contribute to an EFA, areas of agro-forestry and afforested land must currently receive support from the CAP under the forestry measures within national or regional Rural Development Programmes or have received support under past RDPs. They must continue to comply with the conditions set out for receipt of RDP funding. In relation to the afforested areas, areas that have received support under national schemes that are compliant with RDP rules are also eligible.

Implementation

Six Member States have included agro-forestry as eligible for EFA out of the nine countries investigated for this study (not NL, PL and RO), compared with 11 for the EU-28. Eight chose afforested areas (only the NL did not), compared with 14 for the EU-28.

[14] Dicks L, Ashpole J, Dänhardt J, James K, Jönsson A, Randall N, Showler D, Smith R, Turpie S, Williams D, Sutherland W. (2013) Farmland Conservation: Evidence for the effects of interventions in northern and western Europe. Exeter, Pelagic Publishing.

[15] Critchley, C. N. R., Mole, A. C., Towers, J., Collins, A. L. (2013). Assessing the potential value of riparian buffer strips for biodiversity. Aspects of Applied Biology 118: 101 – 108.

[16] Clarke J, Cook S, Harris D, Wiltshire J, Henderson I, Jones N, Boatman N, Potts S, Westbury D, Woodcock B, Ramsay A, Pywell R, Goldsworthy P, Holland J, Smith B, Tipples J, Morris A, Chapman P, Edwards P. (2007). The SAFFIE Project Report. ADAS, Boxworth, UK

[17] Heard M, Botham M, Broughton R, Carvell C, Hinsley S, Woodcock B, Pywell R. (2012) Quantifying the effects of Entry Level Stewardship (ELS) on biodiversity at the farm scale: the Hillesden Experiment. NERC/Centre for Ecology & Hydrology, 238pp. (CEH Project No: C03291) (Unpublished)

In many cases the reason for not choosing these elements is that no agro-forestry or afforestation has been funded under RDPs in the past and the measures are not chosen within their country's current RDPs and therefore there are no areas that would be eligible.

No further information is available on whether additional specific rules associated with these options are stipulated in the relevant Member States.

Traditional silvo-arable practices tend to be positive for biodiversity and some of the more modern systems can also have positive effects as a result of integrating tree crops within existing arable or grassland. These include biodiversity benefits (Palma *et al,* 2007[18]) and improved habitat connectivity (Broom *et al,* 2013[19]). Some evidence suggests that the trees can reduce nitrogen leakage from the crop (Liagre *et al*. 2012[20]) and also soil erosion from arable land (Reisner *et al*. 2007[21]). Compared to conventional intensively cropped arable land, agro-forestry has the potential to sequester significantly more CO2 (Aertsens *et a*l, 2013[22]) not just in the woody vegetation but also in the topsoil under the trees (Cardinael *et al*. 2014[23]).

Afforestation can have a wide range of positive or negative impacts on biodiversity, soil and water protection, with the benefits depending on location, species planted and other design and management factors. There will also be some carbon sequestration from the trees. The fact that only those areas receiving support under RDPs are eligible for the measure should help ensure that the areas counting towards an EFA are positive environmentally, however evaluations of previous RDPs have identified some concerns about the nature of afforestation that has been funded (for example, BirdLife International, 2009[24]).

Nonetheless, because only those areas that are already supported via rural development policy are eligible, (and trees are already planted) the inclusion of these areas within an EFA will not deliver any additional environmental benefit to that which is provided already.

[18] Palma, J.H.N., Graves, A.R., Burgess, P.J. and Herzog, F. (2007). Integrating environmental and economic performance to assess modern silvoarable agroforestry in Europe. Ecological Economics 63: 759-767.

[19] Broom DM, Galindo FA, Murgueitio E. 2013 Sustainable, efficient livestock production with high biodiversity and good welfare for animals. Proc R Soc B 280: 20132025. http://dx.doi.org/10.1098/rspb.2013.2025

[20] Liagre, F., Santi, F., Vert, J. (2012). Agroforestry in France: Benefits and issues. Analysis No. 37 Centre for Studies and Strategic Foresight. Paris

[21] Reisner, Y., de Filippi, R., Herzog, F. and Palma, J. (2007). Target regions for silvoarable agroforestry in Europe. Ecological Engineering 29, p. 401-418

[22] Aertsens J, Nocker LD, Gobin A (2013) Valuing the carbon sequestration potential for European agriculture. Land Use Policy 31:584–594

[23] Cardinael, R. Chevallier, T., Barthès, B., Dupraz, C., Chenu, C. (2014). Soil carbon sequestration in a Mediterranean agroforestry system. In: 2nd European Agroforestry Conference: integrating science & policy to promote agroforestry practice. Book of Abstracts (p. 7-9). Presented at 2. European Agroforestry Conference, Cottbus, DEU (2014-06-04 - 2014-06-06). European Agroforestry Federation (EURAF).

[24] BirdLife International, 2009, Could do better – How is EU Rural Development policy delivering for biodiversity?

2.1.7 Strips of eligible hectares along forest edges

General rules

Member States can choose whether or not to allow agricultural production on strips of land along forest edges or they can provide both options to farmers. The weighting factor for strips with production is lower than those without (see Table 12 in Annex 1). In those cases where agricultural production is not permitted, grazing or cutting may be permitted as long as the strip remains distinguishable from the adjacent land. Strips must not be wider than 10 metres. Member States can specify the minimum width as long as this is not below one metre.

Implementation

Within the EU-28, nine Member States have included these strips as eligible to count towards farmers' EFA obligation. Of these, only four countries have restricted the option to those strips with no production (BE-WA; BG; DE, HR). The remainder have included both options (with or without production).

Five of the countries reviewed for this study included strips along forest edges as eligible to count toward the EFA. All but Germany included options for strips with production and without. Information on the width of strips chosen was only available for France, Germany and Hungary, all of which chose the maximum flexibility permitted of 1-10 metres. For those strips without agricultural production, only Germany and Hungary chose not to apply the conversion factor permitted[25], meaning that more metres would be needed of these strips to meet the EFA obligation than if the conversion factor had been applied (see Table 4). For strips where production is permitted, both Italy and Hungary chose not to apply the conversion factor.

Table 4: Eligible area for strips along forest edges with and without the conversion factor

EFA element	Conversion factor	Weighting	EFA area
Strips of eligible hectares along forest edges (per 1m)			
Without production	6	1.5	9 m^2
With production	6	0.3	1.8m^2
Calculation without the conversion factor			
Without production		1.5	1.5 m^2
With production		0.3	0.3 m^2

Source: own calculation based on weighting and conversion factors set out in delegated regulation 639/2014

Woodland edges, if managed appropriately, can provide benefits for biodiversity, including for birds, butterflies and other invertebrates. These benefits are mostly likely to be evident on those strips on which no production is taking place. For this reason it is positive to see that the conversion factor has not been applied in some countries on those strips on which production is permitted, meaning that these areas are 'worth' far less in terms of their contribution to an EFA obligation than if the conversion factor had been applied. Given that the conversion factor is applied to strips without production, this also has the effect of making such strips a more attractive option in comparison to those with production.

[25] A one metre strip can be converted to metres squared, using a conversion factor of 6 (as set out in Annex II of Delegated Regulation (EU) 639/2014)

2.1.8 Areas with short rotation coppice (SRC)

General rules

No use of mineral fertiliser and/or plant protection products is permitted on SRC if it is to count towards an EFA. Member States have to put together a list of species that can be used for this purpose. This should select[26] only those SRC species that are most suitable from an ecological perspective, excluding those that are not indigenous. Member States also have to establish the requirements relating to the use of mineral fertilisers and plant protection product, bearing in mind the fact that the objective of EFAs is to 'safeguard and improve biodiversity'.

Implementation

Within the EU-28, 20 Member States chose to allow short-rotation coppice (SRC) to count towards an EFA. The number of coppice species chosen ranged from one to ten with the most popular being willow (*Salix*) (20 MS), poplar (*Populus*) (17), alder (*Alnus*) (14), birch (*Betula*) (11) and ash (*Fraxinus)* (11) (European Commission, 2015).

Amongst the countries reviewed for this study, eight chose to permit SRC within EFAs (all except Spain). In the UK, only Northern Ireland and Wales included SRC. The number of species chosen ranged from one (in the Netherlands) to nine (in France and the UK-Wales).

The most popular species (willow, poplar and alder) permitted in these countries mirrors the situation for the EU-28 and these are amongst the more common species actually used for short rotation coppice. However, some countries have also included trees species that are less commonly cited in the literature as species used for SRC, including eastern black walnut (*Juglans nigra*), plane trees (*Platanus spp*.) and elm (*ulnus spp*). The inclusion of black locust (*Robinia spp*) in Romania could be a concern, however, given that it is a non-native species and can be very invasive in open habitats. It is a common tree used for shelterbelts and plantations in Romania and recommended for the restoration of degraded soils since it grows quickly, fixes nitrogen and improves soil organic matter. However, it can be problematic if planted on sandy grasslands and has been reported as a threat to a number of Natura 2000 habitats and controlling *Robinia* plantations in and around Natura 2000 sites is mentioned as a management measure for several sites[27],[28].

In terms of environmental benefits more generally, SRC can have some positive biodiversity impacts, supporting birds of woody open range habitats (Glemnitz *et al*. 2013[29]). However, benefits tend to depend on both the alternative land use that has been displaced and the

[26] Under Article 4(2)(c) of Regulation (EU) 1307/2013, Member States have to define the tree species qualifying for short rotation coppice (according to the definition in Article 4(1)(k) of the same regulation and set out the maximum harvest cycle in respect of those tree species. The species eligible for an EFA are a subset of this list.

[27] SFC Calimani-Gurghiu - Securing favourable conservation status for priority habitats from SCI Calimani-Gurghiu, LIFE08 NAT/RO/000502 (http://ec.europa.eu/environment/life/project/Projects/index.cfm?fuseaction=search.dspPage&n_proj_id=3546)

[28] Sturm U and Wilke C (eds) (2012), Management practices for invasive species in Danube Delta Biosphere Reserve (Romania) and Triglav National Park (Slovenia) (http://www2.ioer.de/download/habit-change/HABIT-CHANGE_3_4_1_A_Invasive%20species%20management%20in%20DDBR%20and%20TNP_update.pdf)

[29] Glemnitz, M., Platen, R., Krechel, R., Konrad, J., Wagener, F. (2013). Can short-rotation coppice strips compensate structural deficits in agrarian landscapes? *Aspects of Applied Biology* **118**: 153 – 161

relative edge length of the SRC area and the degree to which this helps to link with other habitats to provide contiguity (Hardcastle *et al.* 2006[30]). It will also have some climate mitigation benefits by sequestering carbon in the soil and can help protect watercourses from pollutants by providing a barrier between the pollutant and the water body, if appropriately sited (McKay 2011[31]).

Table 5: Species permitted under short rotation coppice contributing to EFAs in selected Member States

Species (Latin)	Species (Eng)	FR	DE	HU	IT	NL	PL	RO	UK NI	UK W	MS/ spp
Salix spp	Willow spp	X	X	X	X	X	X	X	X	X	9
Populus	Poplar spp	X	X	X	X		X	X	X	X	8
Alnus spp	Alder	X	X	X	X				X	X	6
Betula pendula	Silver birch	X	X				X		X	X	5
Acer spp	Maple	X		X					X	X	4
Fraxinus excelsior	Ash	X	X	X						X	4
Castanea sativa	Sweet Chestnut	X							X	X	3
Corylus spp	Hazel								X	X	2
Quercus	Oak (incl. sessile oak)		X	X							2
Tilla	Lime								X	X	2
Carpinus	Hornbeam	X									1
Juglans nigra	Eastern black walnut			X							1
Platanus	Plane tree				X						1
Prunus avium	Wild Cherry	X									1
Ulnus	Elm				X						1
Robinia	Black locust							X			1
Species/MS		9	6	7	5	1	3	3	8	9	
Requirements											
Mineral fertilisers		Not allowed	Not allowed	Not allowed	Not allowed	Not allowed	Allowed with limits	Allowed with limits	Not allowed	Not allowed	
Plant protection products		Not allowed	Pesticides not allowed	Pesticides not allowed	Not allowed except organic insecticides	Allowed	Not allowed	Allowed with limits	Allowed until end of year 2	Not allowed except for spot treatment of invasive non-native species in first 2 yrs	
Harvest cycle					Max 8 yrs				Max 5 yrs	Max 20 yrs	

Source: European Commission (2015) and case study expert questionnaire responses

[30] Hardcastle, P.D., Calder, I., Dingwall, l., Garrett, W., McChesney, I., Mathews, J., Savill, P. (2006). A review of the impacts of short rotation forestry. Final Report on SRF by LTS International, February 2006.

[31] McKay, H. (ed.) (2011) Short Rotation Forestry: review of growth and environmental impacts. Forest Research Monograph, 2, Forest Research, Surrey.

2.1.9 Areas with catch crops, or green cover established by the planting and germination of seeds

General rules
Areas of catch crops eligible to count towards an EFA must be those areas established under the rules relating to cross compliance rule SMR1 (compliance with Articles 4 and 5 of the Nitrates Directive[32]) as well as other catch crops. They must be established by sowing a mixture of crop species or by under-sowing grass in the main crop but must not include areas under winter crops, sown in autumn for harvesting or grazing. Member States have to determine:

- The list of mixtures of crop species that can be used;
- The period for sowing for catch crops and/or green cover, which must not be later that 1 October; and
- Additional conditions relating to production methods can be identified.

Implementation
Within the EU-28, 19 Member States opted to include catch crops/green cover as eligible to count towards EFA obligations. The countries that did not choose this option were Estonia, Greece, Spain, Italy, Cyprus, Lithuania, Malta, Portugal and Finland.

Seven of the nine countries reviewed here included this EFA element, all apart from Spain and Italy, as well as Northern Ireland and Wales within the UK. The list of crop species permitted varied significantly between countries, with Germany including 84 species, compared with the UK (England and Scotland) where only seven species are specified. Information on the species on the list was only found for three countries or 4 regions (DE, HU and the UK (Eng/Sc). Three species were included on all four lists (Broad bean – v*icia faba*; white mustard – *sinapsis alba*; and purple tansy – *phacelia tanacetifolia*) and a further two species were included on three of the lists (alfalfa – *medicago sativa*; and rye – *secale cerale*).

Permitted sowing dates differ between countries, but are not significantly different in most cases. Some of the other management conditions, however, do vary, particularly the dates when the crop must be present in the field. For example, in Scotland the crops must be present in the field until 31 December, in England until 15 January, in Poland overwinter crops must be in place until 15 February. In the Netherlands, no dates are set, but the crop must be in the ground for at least 10 weeks. Table 6 sets out the different rules established in the countries reviewed.

[32] Council Directive 91/676/EEC of 12 December 1991 concerning the protection of waters against pollution caused by nitrates from agricultural sources (OJ L 375, 31.12.1991, p. 1)

Table 6: Rules for the use of catch crops to fulfil EFA obligations in selected Member States

	Sowing period	Inputs	Management conditions specified	Other requirements/ conditions	Number of species on the list
FR	1 July – 1 Oct	No restrictions	None specified	-	42
DE	16 July - 1 Oct	No mineral fertiliser or PPP. Farm manure is permitted	Area can be grazed but only by sheep and goats	Min 2 spp (or undersown with grass). No one species to be > 60%.	84
HU	1 July – 1 Oct	No info	Must be ploughed in before setting seed.	Min 2 spp	16
NL	15 July – 1 Oct	No PPP (some exceptions)	Must be in the ground for at least 10 weeks	Catch crops grown after growing maize on sand or loess cannot count as EFA	23 (in 2 categories)
PL	Between 1 July and 10 August (stubble intercrop) or before 1 Oct (winter intercrops	No info	Stubble intercrops must be present until at least 1 Oct and winter intercrops until at least 15 Feb	No info	5 crop families
RO	1 Aug – 15 Oct	No info			Only green cover
UK-E	1 July – 1 Oct	No info	Catch crops: visible by 31 Aug and retained until 1 Oct. Cover crops: visible by 1 Oct and retained until 15 Jan	Sown mix of at least 2 cover types (one cereal, one non-cereal). Grass can be used as long as it was undersown in the previous crop and is sufficiently established. Minimum area = 0.01 ha	7
UK-S	1 August – 1 Oct	No info	Must be present in the field until 31 Dec. Grazing is permitted after the harvest of the main crop. Can be retained later in the season to provide winter cover	Catch crop = undersown grass. Green crop cover = min 2 of the crops on the list.	7

Source: European Commission (2015), elaborated by questionnaire responses from case study experts and national guidance documents.

Catch crops are designed to reduce nitrogen losses during the winter and cover crops to reduce soil erosion and nutrient losses. From a biodiversity perspective, winter catch crops generally are better for farmland birds than bare soil but they do not provide seeds over this

winter period are less beneficial than cereal stubble (Golawski *et al*. 2013[33]). They may also provide a climate mitigation benefit resulting from reduced N_2O emissions in winter (BIO Intelligence service, 2010[34]). There seems to be an increasing trend in some countries, especially where minimum or zero tillage techniques are practiced, for farmers to use herbicides to 'burn down' the cover crop rather than ploughing it in, as was more common previously. While the minimum/zero tillage techniques can be beneficial for soil carbon, particularly in arid climates, the use of herbicides will have an impact on above ground biodiversity, by suppressing broad leaved weeds that are beneficial pollen and nectar sources for insects[35]. Depending on the intensity of use and type of herbicide used, these may also cause issues for water quality, with herbicide persistence in water courses being identified as an issue with regard to compliance with the Water Framework Directive[36].

It is difficult to assess the environmental implications of the different conditions that have been placed on the establishment and subsequent management of cover crops as these will depend on local conditions. However, it is notable that only in Germany has the use of mineral fertilisers and pesticides been banned (with the exception of organic fertiliser) and in the Netherlands the use of plant protection products in not permitted. Avoiding the use of fertilisers and plant protection products is likely to enhance the overall environmental benefits of the crops and help avoid the leaching of deleterious substances into water courses. The period over which the crops need to be present in the field also vary. Some of the end dates look rather early (e.g. end of December in Scotland) but these will depend on the optimal dates for the sowing of spring crops in different countries.

2.1.10 Areas with nitrogen fixing crops

General rules:

Member States must provide a list of eligible N-fixing crops which are considered to contribute to the objective of improving biodiversity. These crops must be present during the growing season (according to the crop specific growing season which is typical for the given species and production purpose). Member States must also set out rules on where N-fixing crops that count towards an EFA can be grown, to avoid any increased risk of nitrogen leaching in the autumn. These rules must take into account the requirements of the Nitrates directive and the Water Framework directive. Additional conditions can be imposed too, for example in relation to production methods. N-fixing crops have a weighting factor of 0.7, increased from the 0.3 agreed in Annex II of the original delegated act[37]. This means that a

[33] Golawski, A., Kaspryzkowski, Z., Jobda, M., Duer, I. (2013). The importance of winter catch crops compared with other farmland habitats to birds wintering in Poland. *Polish Journal of Ecology* **61** (357 – 364).

[34] BIO Intelligence service (2010). Environmental impacts of different crop rotations in the European Union. Report for the European Commission (DG Environment). http://ec.europa.eu/environment/agriculture/pdf/BIO_crop_rotations%20final%20report_rev%20executive%20summary_.pdf

[35] Melander, B, Munier-Jolain, N, Charles, R, Wirth, J, Schwarz, J, Van Der Weide, R, Bonin, L, Jensen, P K and Kudsk, P (2013) European perspectives on the adoption of nonchemical weed management in reduced-tillage systems for arable crops. Weed Technology No 27 (1), pp231-240.

[36] Wagner, N, Reichenbecher, W, Teichmann, H and Lötters, S (2013) Questions concerning the potential impact of glyphosate-based herbicides on amphibians. Environmental Toxicology and Chemistry No 32 (8), pp1688-1700.

[37] As agreed in Commission Delegated Regulation (EU) No 1001/2014 of 18 July 2014 amending Annex X to Regulation (EU) No 1307/2013 of the European Parliament and of the Council establishing rules for direct payments to farmers under support schemes within the framework of the common agricultural policy

lower proportion of N-fixing crops can count towards the EFA obligation than was originally agreed.

It is not possible to mix nitrogen fixing crops with other species, like species of grasses. However, provided that only nitrogen fixing crops species are seeded, some grass that grows spontaneously is acceptable if the nitrogen fixing crops remain predominant.

Implementation:
Within the EU-28, 27 Member States chose to allow nitrogen-fixing crops (NFC) to count towards an EFA, making it the most popular EFA option chosen. The number of species permitted ranged between 4 and 19 crops. The most popular were: faba bean (Vicia faba) (all MS), pea (*Pisum spp*) (26), alfalfa (*Medicago*) (26), lupin (*Lupinus*) (24), and clover (*Trifolium*) (24).

All nine of the Member States which are the focus of this report opted to include NFC within the elements that could count towards an EFA. Within this group of countries, the most popular species were lupins (*Lupinus spp*) and faba bean (*Vicia faba*) (all nine countries), followed by Alfalfa (*Medicago spp*) – all except UK (NI); field bean (*Phaseolus vulgaris*) – all but NL; and pea (*Pisum sativum*) – all but NL. Lentils, sainfoin and clover species were next most popular. In terms of the number of crops permitted, this ranged from 6 – 19 crops, with the UK (NI) and NL permitting six and seven crops respectively, and the highest number being permitted by France (18) and Italy (19). Table 7 sets out the crops permitted in the countries reviewed.

From the information that was possible to source for this study, one of the most notable findings is that only the Netherlands of the group of countries reviewed, does not permit fertiliser to be used on these crops. However, there is little information readily available regarding pesticides. In Germany and the UK pesticides are permitted, in keeping with good practice guidelines and it is likely that this is the case for other countries too, especially if fertilisers are permitted. A number of additional conditions have been introduced in different countries, as follows:

- ***Germany:*** there are different dates stipulated for the timespan that different crops must be in the ground:
    - Soyabeans, Linseed, Lupins and beans: 15 May – 15 August
    - All other species: 15 May – 31 August

  These must be followed by a winter crop or cover crop which must stay in the ground until 15 February the following year to avoid nitrate leaching.
- ***Hungary:*** the ceilings specified in the Nitrate Action Plan (NAP) for fertiliser inputs must be respected and crops from seed mixtures are permitted as long as they contain at least one species from the list.
- ***Spain*** – the crop must be in the ground for a minimum period of time as follows:
    - Crops for food – to be left until grain is mature.
    - Crops for fodder - leave until flowering starts.

  N fixing crops must be followed by a crop needing nitrogen (i.e. not fallow) to avoid risk of nitrogen leaching.

- ***UK (England):*** the crop must be in the soil between 1 May and 30 June for inspection and the minimum areas that can count towards the EFA obligation is 0.01 ha.
- **UK (Northern Ireland**): the crop must be in situ for the entire period from 1 June - 31 July
- **UK (Scotland**): the crop must not be harvested before 1 August in order to protect ground nesting birds
- **UK (Wales**): the crop must be present during the growing season and it can be a single crop or a mix of nitrogen-fixing crops (but the mix cannot include other crops).

Table 7: Crops permitted as Nitrogen Fixing Crops contributing to EFAs in selected Member States

Common Name	Latin Name	FR	DE	HU	IT	NL	PL	RO	ES	UK E	UK NI	UK S	UK W	Total MS/NFC
Lupina	*Lupinus spp*	X	X	X	X	X	X	X	X	X	X	X	X	12
Faba bean	*Vicia faba*	X	X	X	X	X	X	X	X	X	X	X	X	12
Alfalfa/lucerne	*Medicago*	X	X	X	X	X	X	X	X	X		X	X	11
Field Bean	*Phaseolus vulgaris*	X	X	X	X		X	X	X	X	X	X	X	11
Pea	*Pisum sativum*	X	X	X	X		X	X	X	X	X	X	X	11
Lentil	*Lens spp.*	X	X	X	X		X	X	X	X		X	X	10
Sainfoin	*Onobrychis spp.*	X	X	X	X	X	X	X	X	X			X	10
Clover spp.	*Trifolium spp.*	X	X	X	X	X	X	X		X		X	X	10
Chickpea	*Cicer arietinum*	X		X	X		X	X	X	X		X	X	9
Birdsfoot trefoil	*Lotus corniculatus*	X	X	X	X	X	X			X		X	X	9
Vetch spp (excl faba bean)	*Vicia spp (excl. vicia faba)*	X	X	X	X	X			X		X	X	X	9
Soybean	*Glycine max*	X	X		X		X	X		X			X	7
Beans	*Vigna spp*	X			X			X		X	X	X	X	7
Sweet clover	*Melilotus spp.*	X	X	X			X			X			X	6
Grass pea	*Lathyrus sativus L*	X		X	X		X		X					5
Fenugreek	*Trigonella foenumaraecum*	X			X				X	X				4
Common birds' foot	*Ornithopus sativus*	X	X				X							3
Peanut	*Arachis hypogoaea L.*	X			X									2
French honeysuckle	*Hedysarum coronarium*				X				X					2
Dolichos	*Dolichos lala*				X									1
Crown vetch	*Coronilla varia*			X										1
Liquorice	*Glychyrrhiza glabra*				X									1
Total NFC/MS		18	13	14	19	7	14	11	12	14	6	11	14	
Fertiliser permitted?		Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Pesticides permitted?		NI	Yes	NI	NI	No*	NI	NI	NI	Yes	Yes	Yes	Yes	

NI = No information ; * not permitted only for certain crops

Source: European Commission (2015)

Figure 4 shows the dates established in different countries for N-fixing crops alongside those for catch crops and cover crops and fallow.

The environmental impacts of planting N-fixing crops are very context dependent and it is difficult to generalise. Member States were supposed to submit evidence that the N-fixing crops chosen contribute to biodiversity. However, (assuming that this evidence was provided), it has not been possible to source this for the countries reviewed.

A study for the European Parliament (Bues *et al*, 2013[38]) examined the environmental and resource impacts of protein crops in the EU. They concluded that there were a number of environmental benefits from the cultivation of these types of crops, including: reductions in CO_2 emissions due to reduced fertiliser requirements, improved soil structure and soil organic matter content, as well as benefits for pollinators from the flowering habits of protein crops. However, the study noted that 'protein crops can decrease or increase emissions of nitrates to ground water, depending on the management of crop residues and the use of other crops to reduce nitrate leaching'.

Row crops with wide spaces between the rows (e.g. bean (*Phaseolus spp.*), bean (*Vigna spp*.), chickpea (*Cicer spp*.), faba bean (*Vicia faba*), lentil (*Lens culinaris*), lupin (*Lupinus spp*.) and soya (*Glycine max*) are less beneficial for biodiversity as they tend to have 'an uneven and short flowering period and are poor nectar producers….require soil tilling and additional nutrients, which are in most cases supplied by mineral fertilisers'[39]. Weeds are more prevalent due to the wide spacing of the crops and these tend to be controlled using herbicides. From a biodiversity perspective, the more nitrogen that is added to the crop, the more vigorous the growth, providing less of a beneficial habitat for biodiversity. Amongst these crop species are some that are the most popular chosen for implementation by Member States.

Feed legumes (e.g. Lucerne/alfalfa (*Medicago sativa*), clover (*Trifolium spp*), vetch (*Vicia spp*.), birdsfoot trefoil (*Lotus corniculatus*), vetchlings (*Lathyrus spp*.)) are amongst the N-fixing crops that are more beneficial for biodiversity as they are not sown in rows and grow more densely in the field, thereby requiring less tilling and a lower level of inputs (fertilisers and plant protection products) and flowering more evenly, producing pollen and nectar[40]. More positively, for biodiversity goals two of these species (alfalfa and vetch) also feature as popular N-fixing crops appearing on the lists of most Member States.

Another issue is that these crops can leach large amounts of nitrogen when ploughed. The restrictions put in place in Germany and Spain to guard against this eventuality are reassuring in this regard. However it is a concern that, despite the objectives of EFAs, most countries have chosen to allow N fertilisers to be applied to N-fixing crops and are likely also

[38] Bues A, Preißel S, Reckling M, Zander P, Kuhlman T, Topp K, Watson C, Lindström K, Stoddard F, Murphy-Bokern D (2013) *The environmental role of protein crops in the new Common Agricultural Policy.* European Parliament Directorate General for Internal Policies Policy Department B: Structural and Cohesion Policies Agriculture and Rural Development

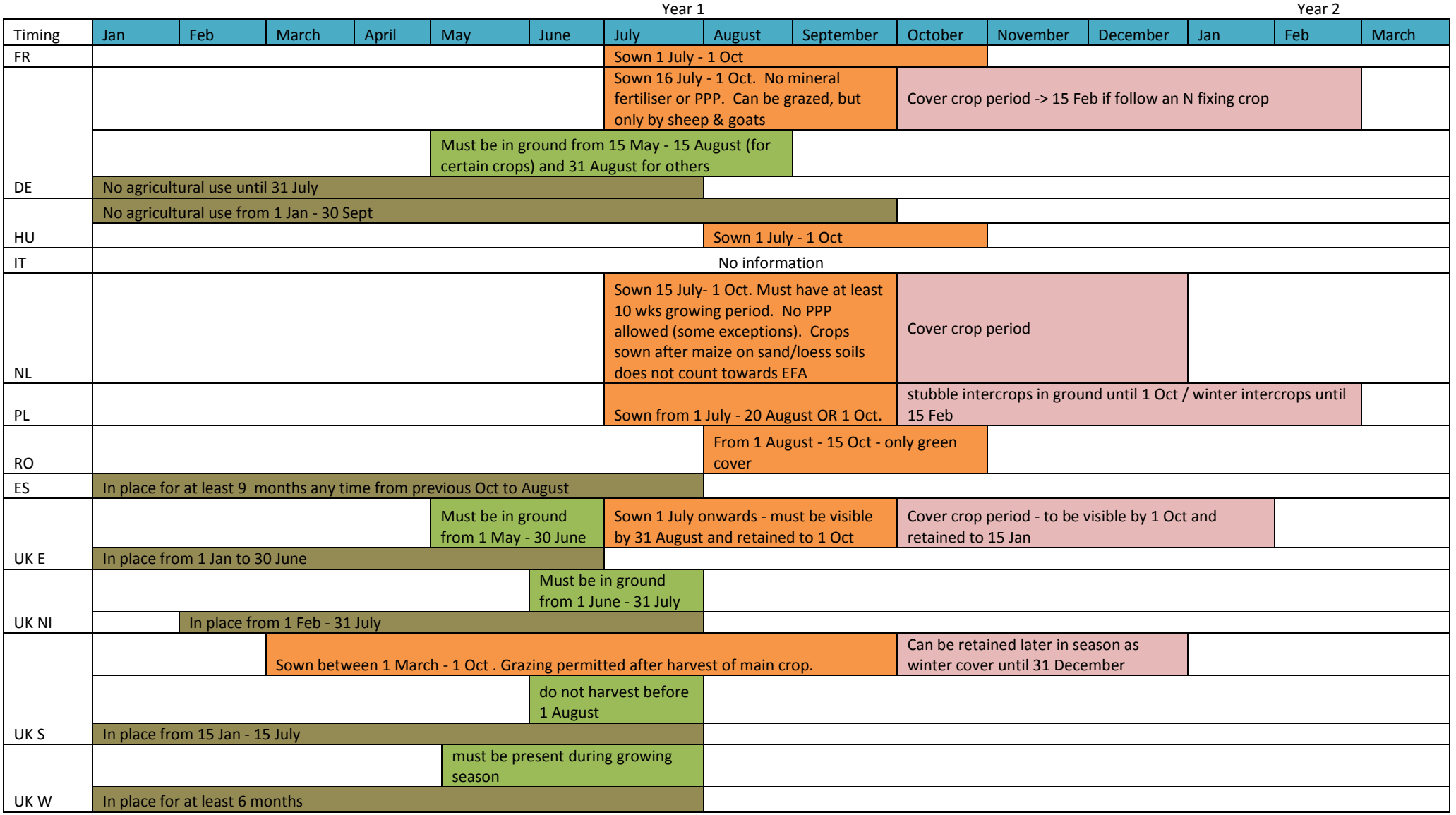
[39] Keenleyside C, Znaor D, Karoglan Todorović, S (2014), Options for EFA measures beneficial for nature and biodiversity in Croatia, unpublished Policy paper to the Ministry of Environmental and Nature Protection, under a project providing consulting services for support to agri-environment schemes, Contract No MENP/QB8/12/01, 18 September 2014.

[40] *ibid*

to have permitted the use of pesticides. The rationale for this appears mainly to ensure that the crop yield is not compromised. It would also be very difficult to control a rule prescribing fertiliser use that applied only on the part of the crop that is used to count towards the EFA obligation.

Another argument in favour of the inclusion of N-fixing crops is the desire to stimulate the production of European-grown protein crops to reduce the EU's dependence on imported soya. Based on a life-cycle assessment, Bues *et al* (2013) concluded that the resource and environmental impacts of growing protein crops in the EU generally 'reduces product life-cycle fossil energy use and the environmental impacts of cropping systems and … products of animals fed with European-grown protein crops compared with animal products using imported soya bean', although these results do depend on assumptions made about which crops are replaced by the protein crops and are influenced heavily by the land use changes induced by soy bean cultivation in South America (e.g. deforestation and destruction of grasslands). However, whether their inclusion within an EFA, which covers a very limited area of land once exemption criteria and weighting factors have been taken into account, is really the optimal policy tools to stimulate European-grown protein crops is questionable, especially when other tools, such as the voluntary coupled support for protein crops, are available.

Figure 4: Seasonal timing rules for the implementation of land lying fallow, catch crops, green cover and N-fixing crops in selected Member States



Source: Questionnaire responses from case study experts and European Commission (2015)

Legend: Fallow | Cover crops and green cover | N fixing crops

2.2 Equivalent practices

Out of the countries investigated here, only the Netherlands applied to the Commission to offer farmers the option of meeting their EFA requirement via equivalent practices.

Two separate certification schemes are in place offering equivalent practices to greening: the 'Akkerbouw-strokenpakket incl. Vogelakker' (arable strip package, including bird fields) which is an alternative to the EFA measure; and the Veldleeuwerik (Skylark Foundation).

The arable strip package allows farmers to implement a combination of equivalent management practices in order to fulfil their EFA requirements. The scheme consists of two elements – an obligatory requirement to put in place managed borders or in-field strips managed for wildlife or specific fauna; and a range of additional supplementary options which can be chosen to meet the EFA obligation (see Box 1)

For farmers with a Veldleeuwerik certificate[41], the rules for implementing the crop diversification and EFA measure are softened somewhat. For example, soya is permitted as a crop under the crop diversification measure, catch crops have to be kept in the ground for eight instead of 10 weeks and some localised use of herbicides is permitted (see Box 2).

A third certification scheme was proposed, Biodiversiteit+, which includes a set of practices that are deemed equivalent to all three greening practices.

However, this was not approved by the European Commission for implementation in 2015. Discussions are ongoing to resolve a number of remaining issues and it is hoped that this can then be rolled out for the 2016 year.

Box 1: Arable strip package (Akkerbouw-strokenpakket incl Vogelakker) equivalence scheme in the Netherlands (2015)

General description: This scheme provides an alternative means of fulfilling EFA obligations using a package/combination of several of the equivalent practices set out in Annex IX of the direct payments regulation. If this scheme is chosen by the farmer, then the whole of the EFA obligation must be fulfilled via this route. The other greening practices (crop diversification and maintaining existing permanent grassland) are implemented using the standard greening rules and do not form part of this scheme.

Equivalence conditions and permitted practices: There are two elements to the scheme: an obligatory element (Part 1) and a set of additional/supplementary practices (Part 2). Weighting factors apply as set out in the delegated act (Regulation 639/2014, Annex II).

Part 1 (Obligatory): to have managed borders or in-field strips managed for wildlife or specific fauna. These must:

i. constitute at least 30% of the weighted area of the overall package;
ii. be sown with a mixture of in particular herbaceous species, possibly supplemented with cereals and/or grass to promote biodiversity, before the 15th of April of the year of application;
iii. be at least 3 metres wide;

[41] a certificate that demonstrates compliance with various sustainable farming practices, mainly targeted to soil management

iv. not have any pesticides applied or disposal of manure and/or mineral fertilisers.
v. On at least 50% of the borders and in-field strips the herbaceous vegetation must be maintained from 1 October until at least 1 February.

Part 2 (supplementary options): in order to fulfil the total EFA obligation, the obligatory managed borders or in-field strips can be supplemented with the following options:

i. Ditches, only if adjacent to the managed borders/strips, with a minimum length of 10 metres; and/or
ii. Landscape features and strips with riparian vegetation with a width of up to 10 metres, but only where these are subject to an agri-environment commitment and managed by pruning, trimming, mowing etc according to the dates, methods and other specifications described in the Dutch Rural development Programme ; and/or
iii. Catch crops (limited to those permissible under the standard greening rules) and the use of plant protections products and irrigation are not permitted. In addition, the same crop may not be sown in the same location two years in a row; and/or
iv. Nitrogen fixing crops: field beans, lupin, red clover, vetch, bird's foot, esparcette, lucerne. For field beans and lupins, fertiliser use is not permitted, but plant protection products can be used. For lucerne, red clover, vetch, bird's foot trefoil and esparcette, fertilisers are permitted, but no plant protection products may be used. No irrigation is allowed and the same crop may not be sown in the same location two years in a row. When on sand and loess soils (as indicated in Dutch Nitrates Action Programme) and if the growing of N-fixing crops ends after the growing season, a follow-up crop should be grown which has to be sown before 1 November of the year concerned and which should stay on the field at least until 1 March of the following calendar year.

Box 2: The Skylark foundation's 'Veldleeuwerik Plus' certification scheme as an equivalent practice in the Netherlands (2015)

Skylark Certificate: Participants of the Skylark certification scheme are famers who show a high level of commitment to sustainable agriculture. In order to receive the Skylark certificate, farmers must:

- have an annually updated externally verified sustainability plan for their farm
- attend 8 regional group meetings or equivalent every year
- implement at least four measures annually from the 10 indicators that form the Skylark approach and for every indicator, implement at least one measure every 4 years
- verify continuous improvement of their sustainability profile in an annual self-assessment

General rules:

1. For 'crop diversification' and 'maintaining existing permanent grassland' (R.1307/2013, art 43(2) (a) and (b)), implementation must be in compliance with the standard greening rules
2. Due to the fact that Skylark certified farmers already demonstrate a commitment towards sustainable agriculture, they are permitted to have a broader interpretation of the standard greening practice requirements for Ecological Focus Areas.
3. A farmer who chooses to fulfil the EFA obligation with the Skylark certificate as an equivalent practice, must fulfil the entire EFA obligation with this practice.

Equivalent practices:

Skylark certified farmers must cover 5% of their arable land with an ecological focus area. Farmers can choose one or more of the following measures:

1. Uncultivated buffer strips and field margins:
    a. That are at least 1m wide and has and maximum width of 20m;
    b. That are seeded with a certified biodiversity improving mix, being a flower mix and/or a grass

mixed with herbs;
   c. the use of pesticides is not allowed. Local mechanical treatment of unwanted problematic weeds (for example *Circium arvense*) is allowed as well local use of plant protection products (with a back spray);
   d. must be seeded before April 15th.
   e. must be mown at least once per year before the October 1st.

2. Nitrogen fixing crops: Skylark certified farmers are allowed to use or plant protection or (mineral) fertilisers on the following crops: Field beans (*vicia faba*), Vetch (*Vicia Sativa*), Lupine (*Lupinus spp*), red clover *(Trifolium pratense*), Bird's foot (*Lotus corniculuatus*), Esparcette (*Onobrychis viciifolia*) Lucerne (*Medicago sativa*) and Soybean.

3. Catch crops: Skylark certified farmers should use catch crops as listed in the Ecological Focus Area rules, but without the requirement of growing the catch crop for at least 10 weeks.

4. Landscape features: Skylark certified farmers can opt for the 'management (pruning, trimming, dates, methods, restoration) of landscape features (trees, hedgerows, riparian woody vegetation, stone walls (terraces), ditches, ponds)' as specified in Annex IX of Regulation (EU) 1307/2013, as long as the landscape features are part of an agri-environnment-climate agreement. If ditches are included, these must be adjacent to the field margin/buffer.

Control responsibilities: The Skylark Foundation carries out audits to certify the participation of farmers in this scheme in keeping with the direct payment regulation rules. It is certified under the Control Union Certifications (CUC) certification programme EN ISO 9001:2008. The certification process is structured in accordance with ISO-17065. CUC holds a valid accreditation certificate issued by the Dutch accreditation board (Raad voor Accreditatie) for several product certification programs based on EN-45011. Transition from EN-45011 towards ISO-17065 will be completed in 2015.

2.3 Potential environmental implications of Member State EFA choices

As initially proposed, by the Commission, EFAs were considered by many to be the greening measure with the greatest potential to deliver environmental benefits, providing much needed habitats and green infrastructure within arable landscapes (see for example Poláková *et al*, 2011[42]). However, following protracted negotiations with national governments and the European Parliament the final, and much expanded, list of elements permissible to count within the EFA has led many to speculate that their implementation may deliver very little additional environmental benefit in practice. Indeed in looking back over the recent CAP reform negotiations, a prominent Commission official has commented that 'The EFA reflects a marginal land conservation measure, as the real additional impact does not exceed 1-2% of total arable land area' (Haniotis, 2015). This is a result of both the actual area subject to EFA requirements once the exemptions have been taken into account and the use of the weighting system[43], which affects the area needed under different practices to meet the five per cent EFA requirement.

[42] Poláková, J, Tucker, G, Hart, K, Dwyer, J, Rayment, M (2011) *Addressing biodiversity and habitat preservation through Measures applied under the Common Agricultural Policy*. Report Prepared for DG Agriculture and Rural Development, Contract No. 30-CE-0388497/00-44. Institute for European Environmental Policy: London

[43] A set of weighting factors exist for each of the EFA elements – these are a factor by which the area of the specific element is multiplied to calculate the area that counts towards the EFA requirement. Some are greater than 1 and these are optional. Some are less than 1 – these are compulsory to implement.

Although each of the permitted practices varies in terms of its potential environmental benefits, overall, on the land to which the EFA obligations apply, some beneficial impacts for biodiversity, soil, water and climate could be anticipated. For biodiversity this could include birds, mammals and invertebrates, as well as aquatic biodiversity benefitting from reduced run off and pollution of water courses. The nature of the impacts, however, will depend on the type, location and management of features at farm level. Impacts will be context specific and depend on the area of land subject to the requirements (i.e. not covered by exemptions from greening) and the extent to which the options applied lead to a change in management or replicate activities that would have taken place even without the greening measure in place.

Those elements with the greatest potential to deliver environmental benefits from the information provided in the preceding sections are:

- land lying fallow;
- landscape features, where the requirements are additional to those protected under cross-compliance;
- buffer strips, where the requirements go beyond those stipulated under cross-compliance and national authorities have permitted activities such as allowing wild bird mix/nectar mixes to be sown on the buffer strip (such as in the UK – England and Scotland)
- strips of land along forest edges – where no production is permitted
- catch crops and cover crops, particularly where there are limitations on the use of fertilisers and plant protection products; and
- certain N-fixing crops (mainly feed legumes), where there is a ban on the use of nitrogen fertiliser, plant protection products, where conditions are put in place to avoid nitrogen leaching when the crop is ploughed and ideally where these form part of a crop rotation.

However, the analysis in this report suggests that many Member States have not implemented the EFA measure in this way. Rather the implementation choices tend to maximise the opportunities to maintain the agricultural status quo. This is done by:

- Promoting production:
    - taking full advantage of the opportunities to support N-fixing crops, often primarily those crops that are of limited environmental value and permitting fertiliser and plant protection products to be used; and
    - allowing production on strips along forest edges.
- Taking advantage of the opportunities to include landscape features, buffer strips and terraces that are protected already under cross-compliance, with limited inclusion of the 'other' options that are permissible under greening;

In those countries where maintaining the status quo appears to be the predominantly approach taken, there is unlikely to be much environmental added value from the EFA measure. Its actual environmental impact will become evident only over time as farmers' decisions on which elements to use to fulfil their EFA obligations becomes clear. However, one might anticipate an increase in the use of nitrogen fixing crops, particularly in areas with good growing conditions for these crops. Planting will be stimulated predominantly by the fact that most countries have introduced voluntary coupled payments for protein crops, as

well as these crops also being possible to count towards the crop diversification greening measure (see section 4). Indeed, early indications from Italy are that a significant increase in areas cultivated with soy has been observed, especially in the most productive areas of Po Valley, in the north of the country (*pers. Comm*.). However, whether or not these areas are being used to count as EFA is not known as yet.

Where EFAs can be comprised of landscape features protected under cross-compliance, this may lead to their improved protection given that farmers may be more inclined to adhere to the requirements given the link with a payment and the more stringent controls that will occur.

It is important to note that conversations with a number of Managing Authorities suggest that one critical factor determining their choice of options within the greening "menu" has been the ease with which they can be administered and controlled, given their clear desire to minimise administrative burdens on themselves as well as on farmers. Given the more general administrative complexity being experienced by Member States in introducing the new greening measures, it has been a priority for many countries to ensure that the measures chosen can easily be administered, controlled and verified to minimise any risk of disallowance of their CAP payments from the EU. Those elements that are easiest to control and verify will tend to be in-field measures, given that they are already the focus of Pillar 1 controls as well as the protection of easily identifiable landscape features, particularly where these are already mapped and controlled in a rigorous way for cross-compliance, for example. This has led to a very variable implementation of the EFA measure amongst Member States.

There are significant variations in the estimates of the area of arable land and the number of farms that are subject to the EFA measure. This is due to the fact that agricultural statistics in the public domain do not break down their data in the categories needed to determine both the numbers of farmers and farms that are eligible but exempt from the EFA according to the range of exemption criteria that exist. Pe'er *et al* (2014)[44] estimated that over 48 per cent of the farmed land is not subject to EFA requirements as a result of the area threshold and this area will increase when the other exemptions are taken into account. However, for the countries studied here the estimates of farms within the EFA suggest a broad range:

- In Italy, it has been estimated that 52 per cent of the arable area and 90 per cent of arable holdings will be exempt from EFA requirements[45];
- In the Netherlands, 28.4 per cent of the arable area and 24.1% of arable holdings will be exempt[46]; and
- In Romania estimates suggest that 40% of the arable area and 98 percent of arable holdings will be exempt.

[44] Pe'er G, Dicks LV, Visconti P, Arlettez R, Báldi A, Benton TG, Collins S, Dieterisch M, Gregory RD, Hartig F, Henle K, Hobsoon PR, Kleijn D, Neumann RK, Robijns T, Scmidt J, Shwartz A, Sutherland WJ, Turbé a, Wulf F, Scott AV (2014) EU Agricultural reform fails on biodiversity: Extra steps are needed to protect farmed and grassland ecosystems, Science, Vol 344, Issue 6188, 6 June 2014

[45] Elaborations on ISTAT (2010), 6th Agricultural Census. From: F. Vanni and C. Cardillo (2014) . "The effect of CAP greening on Italian agriculture", *International Journal of Agricultural Policy,* PAGRI 3/2013

[46] *pers. comm*.

Even if, on average, it is assumed that 60 per cent of arable land is subject to the EFA requirements, the obligations apply only to five per cent of that area, then the EFA requirements would apply to only three per cent of the EU's arable area. If one then takes into account the conversion and weighting factors applied (many of which are greater than 1), then the area subject to EFA obligations decreases yet further. Not only does this raise questions about the value for money of the EFA measure, but it is also a lot lower than the proportion of land that has been estimated to need to be under conservation management to benefit biodiversity, particularly the protection of farmland birds. For example, the evidence suggests that farmland under generic environmental management that is not targeted to specific areas or locations would require over ten per cent of the area to be managed in this way to improve the breeding populations of common farmland birds (Poláková et al, 2011[47]). The coverage of the EFA measure is certainly a long way below this level.

[47] Poláková, J, Tucker, G, Hart, K, Dwyer, J, Rayment, M (2011) Addressing biodiversity and habitat preservation through Measures applied under the Common Agricultural Policy. Report Prepared for DG Agriculture and Rural Development, Contract No. 30-CE-0388497/00-44. Institute for European Environmental Policy: London.

3 Maintenance of permanent grassland

There are two elements to the greening measure for the maintenance of permanent pasture (see Annex 1 for more details).

Firstly, Member States must 'ensure that the ratio of the land under permanent grassland in relation to the total agricultural area declared by the farmer does not decrease by more than 5% compared to a reference ratio to be established by Member States in 2015' (Article 31(2)). The percentage change in permanent pasture may be calculated at national, regional or appropriate sub-regional level. The objective of the measure is defined in recital 42 of Regulation (EU) 1307/2013 as 'to ensure environmental benefits, in particular carbon sequestration'.

Secondly, Member States are required to designate permanent grasslands which are environmentally sensitive in areas covered by the birds and habitats Directives, including in peat and wetlands situated in these areas, *and which need strict protection in order to meet the objectives of those Directives* [own emphasis]. The objective for the protection of 'environmentally sensitive permanent grassland' is to protect species, land of high nature value, protect against soil erosion and protect water quality (Article 41 of Regulation (EU) 639/2014). The area of permanent grassland designated as environmentally sensitive can be added to each year.

3.1 Member State implementation choices for 2015

3.1.1 Maintaining the ratio of permanent grassland to total agricultural area:

Almost all Member States (23) have chosen the most flexible route for maintaining the ratio of permanent grassland by apply it at the national level. Belgium, France, Germany and the UK are the only countries to implement this rule at the regional level[48].

In Germany and the UK, this is the same way in which the previous CAP rules for maintaining permanent grassland were operated[49]. However, for France, this marks quite a change. Previously the rules on maintaining permanent grassland were operated at the farm level. Despite this, although nationally the loss of permanent grassland never exceeded the declines permitted, this masked considerable regional differences. The way that controls were implemented meant that some regions lost over ten per cent of grassland over the period 2005-2011 (most notably Haute Normandie, Basse Normandie and Corsica) and in others the losses were between five and ten per cent (see Figure 5). The move to maintain the ratio of permanent grassland at the regional level therefore in theory is a weakening of the requirement. However depending on how strictly the control system is operated, it may in fact help to slow the decline of permanent grassland in those regions where it is most at risk.

[48] NB: Malta has notified the European Commission that it has no permanent grassland in 2007-13.
[49] Belgium is not commented upon here as it was not one of the countries reviewed for this study.

Figure 5: Changes in proportion of permanent grassland in France by Region (2005-2011)

Régions	2 005 Ratio de référence	Evolution 2005-2011
CORSE	88,56%	-14,9%
PACA	59,87%	3,8%
AUVERGNE	60,81%	-1,6%
RHONE ALPES	54,59%	1,0%
FRANCHE COMTE	50,34%	3,3%
LANGUEDOC ROUSSILLON	52,75%	-3,9%
LIMOUSIN	51,18%	-8,9%
BASSE NORMANDIE	43,81%	-10,1%
BOURGOGNE	38,43%	-0,2%
LORRAINE	39,88%	-4,7%
MIDI PYRENEES	33,23%	7,8%
AQUITAINE	24,54%	-7,5%
ALSACE	21,37%	2,6%
CHAMPAGNE ARDENNE	21,35%	-3,8%
HAUTE NORMANDIE	22,72%	-11,2%
PAYS DE LA LOIRE	20,68%	-5,7%
NORD PAS DE CALAIS	19,43%	-2,5%
POITOU CHARENTES	12,27%	-5,0%
PICARDIE	10,53%	-4,2%
CENTRE	9,47%	-3,5%
BRETAGNE	7,92%	-7,8%
ILE DE FRANCE	2,43%	30,9%
France entière	**29,66%**	**-1,9%**

Source: Commissariat Général au Développement Durable (2014)[50]

However, the impact of the measure on the rate of grassland decline will be limited in those countries where permanent grassland decline was nearing the upper limit of ten per cent permitted before 2013. The new rules will permit a further five per cent of losses, since the baseline has been reset for the 2013-2020 period. This is the case in the UK (England), for example[51] and in a number of the German Laender.

Another important aspect of the measure is the scope for Member States to decide the nature of the authorisation schemes established to determine precisely when permanent grassland can be converted. This will have an impact on the type of grassland that is converted and the likely net declines. For example, Germany has put in place a permitting system for all farmers wishing to convert any permanent grassland, with a requirement that any declines must be compensated by increases in permanent grassland elsewhere, whereas England (UK) does not take action until the five per cent threshold is reached (see Box 3).

[50] Commissariat Général au Développement Durable (2014), The implementation of green direct payments in France, presentation to the EEB conference 'New CAP in Action: What chance left for sustainable farming in the implementation', Athens, 7 May 2014

[51] Pinches C and Chaplin S (2014) Recent losses of permanent grassland – an assessment of the evidence, Natural England Research Report NERR060, published 18 December 2014

Box 3: Authorisation procedures for ploughing permanent grassland in England (UK) and Germany

In **England,** if the percentage of permanent grassland in England – relative to the area of agricultural land – were to fall by more than 5%, farmers who had ploughed permanent grassland may have to re-instate it. The Rural Payment Agency (RPA) monitors the situation in England and if the threshold is breached, the RPA would write to inform farmers of what action needed to be taken and restrictions on any further ploughing of permanent grassland would then be put in place. However, permanent grassland within Natura 2000 areas must not be ploughed at all (see below for the designation of environmentally sensitive permanent grassland) and for permanent grassland outside Natura 2000 areas which has not been cultivated for 15 years, or which is semi-natural grassland (or another semi-natural area), a screening decision from Natural England (the statutory agency for the natural environment) is required under the Environmental Impact Assessment Regulations[52].

In Germany, prior approval is required before any permanent grassland is converted to other uses (permanent grassland designated as environmentally sensitive cannot be ploughed). A permit has to be requested from the competent authorities at the regional level and this will not be approved if the land is protected by other legislation or if the 5 per cent threshold in the region has been breached. As a basic rule, a permit will only be provided if an equivalent area of land is being converted back to permanent grassland elsewhere in the region. This area could already be under grass or other herbaceous forage, but currently included within the arable rotation and therefore not yet defined as permanent grassland. The corresponding area could be managed by another farmer, but if that is the case then a letter of intent is required to demonstrate the commitment to this change in land use. As an exception to this rule, a permit may be given to remove permanent grassland without needing to reinstate an equivalent area elsewhere - if the land in question is under an agri-environment-climate measure or the permanent grassland was registered as such for the first time in 2015[53].

3.1.2 Environmentally sensitive permanent grassland

As outlined above, Member States must designate environmentally sensitive permanent grassland (ESPG) in areas covered by the EU birds and habitats Directives where strict protection is considered necessary to meet the objectives of the Directives. This means that not all permanent grassland within Natura 2000 areas is required to be designated, although considerable areas are. In addition, Member States have the option to designate further areas of ESPG outside Natura 2000 sites. Annex 1 sets out the types of grassland that this might cover.

For the EU-28, ten Member States (including three of the UK regions – England, Northern Ireland and Scotland) designated 100 per cent of permanent grassland within Natura 2000 areas. This contrasts with five Member States which designated less than ten per cent of the permanent grassland within their Natura 2000 area (Austria 6%, Latvia 3%, Ireland 2%, Portugal 1% and Estonia 1%). The figures for all countries are set out in Table 9.

Only four Member States chose to designate ESPG outside Natura 2000 areas (CZ, LV, LU, UK-W). Of those only Wales was included within the countries investigated here (see Table 8).

[52] Rural Payments Agency, 2015, The Basic Payment Scheme in England 2015 https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/406452/BPS_Handbook_-_final_v1.0.pdf

[53] Bundesministerium für Ernährung und Landwirtschaft (2015) Umsetzung der EU-Agrarreform in Deutschland, Ausgabe 2015

Table 8: Area of land designated as ESPG outside Natura 2000 areas for selected Member States

Member State	ESPG designated outside Natura 2000 areas (ha)
France	0
Germany	0
Hungary	0
Italy	0
Netherlands	0
Poland	0
Romania	0
Spain	0
UK - England	0
UK – Northern Ireland	0
UK – Scotland	0
UK - Wales	53,718

Wales designated a further 53,718 hectares of pasture land as environmentally sensitive outside of Natura 2000 areas. This is land protected under national nature conservation legislation, known as biological Sites of Special Scientific interest (SSSI) (i.e. excluding those designated for geological / earth science features). The aim is to protect all of these from being converted to arable use or ploughing even if they are not part of the Natura 2000 network. The only exception is where the SSSI rules include written consent to plough in accordance with Section 28E of the Wildlife and Countryside Act 1981 (i.e. it requires ploughing for protection of the habitat).

Table 9: Area and proportion of permanent grassland in Natura 2000 areas designated as environmentally sensitive by Member States.

NB: Shaded countries are those that are the focus of this report

	Total area of permanent grassland in Natura 2000 (ha)	Total area of designated sensitive grassland in Natura 2000 (ha)	% ESPG in Natura 2000 (per MS or region)
BG	426,348.00	426,348.00	100%
CZ	131,914.99	131,914.99	100%
EL	489,922.99	489,922.99	100%
ES	1,914,265.44	1,914,265.44	100%
IT	869,545.00	869,545.00	100%
HU	499,691.51	499,691.51	100%
NL	51,451.00	51,451.00	100%
SK	149,651.33	149,651.33	100%
FI	2,700.00	2,700.00	100%
SE	45,595.00	45,595.00	100%
UK - E	304,969.00	304,969.00	100%
UK - W	111,330.00	111,330.00	100%
UK - NI	37,338.26	37,238.77	100%
HR	44,101.64	35,227.97	80%
CY	776.68	557.83	72%
DE	958,000.00	615,000.00	64%
FR	1,760,000.00	1,111,000.00	63%
BE - Fl	24,586.00	12,188.00	50%
LT	68,880.54	29,135.51	42%
PL	622,927.00	260,715.00	42%
UK - S	812,178.00	332,702.00	41%
BE - Wa	25,850.00	9,050.00	35%
SL	73,909.00	19,400.00	26%
LU	8,573.00	2,121.00	25%
DK	52,000.00	10,500.00	20%
AT	269,414.00	15,276.00	6%
LV	62,634.00	1,797.00	3%
IE	32,933.22	613.63	2%
PT	284,049.59	1,726.68	1%
EE	26,000.00	130.00	1%
MT	No permanent grassland	No permanent grassland	
RO	No information	No information	
Total	**10,161,535.19**	**7,491,763.65**	**74%**

Source: European Commission (2015)

The rationale for why Member States have chosen to designate a particular proportion of permanent grassland within Natura 2000 areas as environmentally sensitive is of considerable interest. An attempt was made to investigate for four of the countries that are the focus of this report, selecting those that designated less than 100 per cent of their Natura 2000 areas (DE, FR, PL, UK(Sc)). This information has not been straightforward to obtain. However some information for France and the UK is provided below. No information on the area of permanent grassland designated in Romania is available, even in the Commission figures.

In the UK (Scotland) only 41 per cent of permanent grassland within Natura 2000 areas has been designated as environmentally sensitive. The guidance to farmers provides a rationale. It states that Environmentally Sensitive Grasslands have been defined as "sites of special scientific interest", a national designation, that are designated as part of the Natura 2000 network, where land managers will already be bound by the existing specific management agreements in place to ensure they are protected and managed sympathetically[54]. However, it was agreed that it would not be appropriate to ban all grassland within these sites from ploughing, given that for some semi-natural habitats, including grassland such as "machair", plant communities depend on periodic cultivation for their survival. Maps of sufficient detail for inclusion within the Land Parcel Identification Scheme (LPIS) are not available currently in Scotland to identify which grasslands are designated as environmentally sensitive and which are not. As a result, until full and accurate mapping becomes available, it has been proposed that any area that has been cultivated within the last 15 years is exempt from classification as environmentally sensitive grassland (*pers. comm*.).

In France, two criteria were used to designate environmentally sensitive permanent grassland within Natura 2000 areas[55]:

- All areas declared as 'landes et parcours[56] (areas that are rarely managed agriculturally with various vegetation types – moorland, heathland, steppe etc) and as mountain summer pasture ('estives') in Natura 2000. These amount to 629,000 ha[57];
- Natural pastures ('prairies naturelles') considered rich in biodiversity within Natura 2000 areas - 482,000 ha.

The criteria used for the latter selection were elaborated by the French National Museum of Natural History on "the basis of the distribution of habitats and species in Natura 2000 grassland from the occurrence of habitat and species of community interest as per the Birds and Habitats Directives". The focus has been to protect in particular those areas with rich humid or mesophilic biodiversity[58]. However, this has meant that some pastures that contain only one or a limited number of protected species in abundance, rather than a diversity of species, are left unprotected. The designation of ESPG is fixed in France for the period 2015-2020[59]. In cases of non-compliance, the greening payment will be reduced; a

[54] Scottish Government (2015), Basic Payment Scheme: Greening. https://www.ruralpayments.org/publicsite-rest/fscontent/repository/portal-system/mediadata/media/resources/greening_booklet_for_online_-_february_2015~1.pdf

[55] French Senate, April-June 2015 http://www.senat.fr/questions/base/2015/qSEQ150516289.html

[56] 9 Jan 2015 http://www.lafranceagricole.fr/archive/article/pac-2015-les-prairies-sensibles-sont-limitees-aux-zones-natura-2000-FA357201801.html

[57] Jan 2015 http://www.agri72.fr/verdissement-derniers-arbitrages-rendus-sur-le-maintien-des-prairies-permanentes-actualite-numero-2184.php

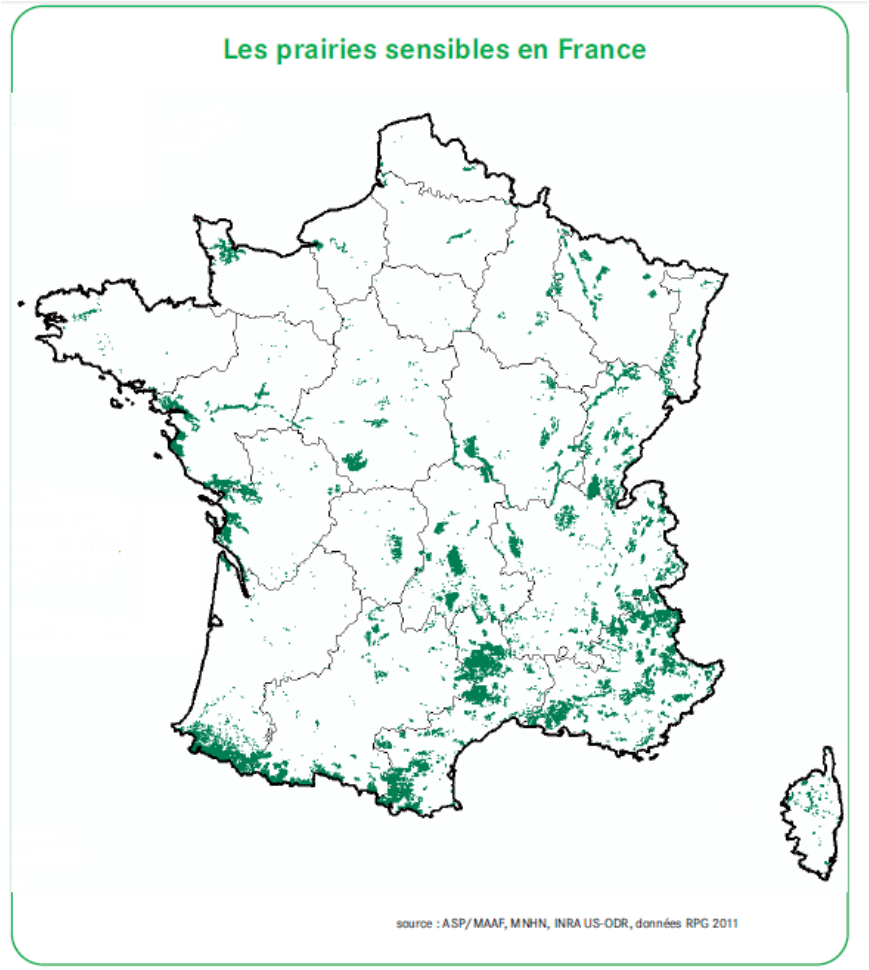
[58] http://www.indre.gouv.fr/content/download/9758/70733/file/Article%20DDT_semaine20_2015.pdf

[59] http://www.lot.chambagri.fr/fileadmin/documents_ca46/internet/Actualites/PAC/2015/PAC2015_verdissement_V4.1_mai15.pdf

fine may be applied (not in the first years of implementation), and mandatory re-seeding of the grassland must take place before 15 May of the subsequent year[60].

All farmers have access via the French e-platform of the CAP to a map of the permanent grassland and environmentally sensitive permanent grassland located on their farm[61]. The national map can be seen in Figure 6.

Figure 6: Map of environmentally sensitive permanent grasslands in France



[60] Coordination Rurale, March 2015. Available at: http://www.google.fr/url?sa=t&rct=j&q=&esrc=s&source=web&cd=3&cad=rja&uact=8&ved=0CDIQFjAC&url=http%3A%2F%2Fwww.coordinationrurale.fr%2Findex.php%3Foption%3Dcom_k2%26Itemid%3D378%26id%3D1207_8ad2e51bc9a4f8479724e49394c45e6a%26lang%3Dfr%26task%3Ddownload%26view%3Ditem&ei=iK6bVd5Hh66zAdX-sYAI&usg=AFQjCNE73jSONK5J7okjo-9cxESqYYEubA&bvm=bv.96952980,d.ZGU

[61] April 2015
Document prairies sensibles Telepac par France Agricole
http://www.lafranceagricole.fr/actualite-agricole/pac-2015-prairies-sensibles-la-liste-des-parcelles-classees-par-exploitation-disponible-sur-telepac-102835.html

3.2 Potential environmental implications

Maintaining the area of permanent grassland at 95% of the reference level should have some benefit for the environment. The most widespread impacts are likely to be in terms of constraining the conversion of improved grasslands to temporary (mainly rotational) grasslands and arable crops (e.g. maize), with benefits for soil condition and biodiversity, and knock-on benefits higher up the food chain, as well as for aquatic biodiversity. However, it should be noted that the definition of permanent grassland allows for ploughing and reseeding as long as the land remains under grass. The conversion of semi-natural grasslands, which are of particularly high biodiversity value, to temporary grassland or arable is also likely to be constrained, although this can only really be secured either where the land is designated as environmentally sensitive and therefore ploughing is banned (see below) or where pre-authorisation procedures are in place to check the type of grassland to be converted to other uses (see below). Where the permanent grassland is semi-natural habitat, there will be benefits for biodiversity in maintaining these habitats; and where grassland is not ploughed or in long leys there will be climate mitigation benefits through carbon sequestration – although these emission removals will only be temporary if the land is ploughed and reseeded regularly. However, the fact that 24 countries are continuing to implement the rules at a national level, means that significant permanent grassland removal/loss could still occur in some regions, with these losses being compensated for by increases or lower levels of removals in other areas. This may then lead to greater regional differentiation between different farm types as trends towards more specialist arable and more specialist grass based farms continue.

The nature of the authorisation procedures will have an effect on the type and level of permanent grassland reductions that take place in practice. For example, the permitting system introduced in Germany is likely to constrain permanent grassland decline far more than in those countries where action is only taken once the five per cent threshold is reached. In the UK (most regions), the EIA (Agriculture) regulations are used to control declines or improvements in semi-natural permanent grassland. These regulations require Member States to act to minimise environmental damage from agricultural developments and other 'projects' in rural areas including the restructuring of agricultural land and conversion of uncultivated or semi-natural habitats to intensive agricultural management. However, the degree to which it provides an effective mechanism to prevent the ploughing of semi-natural grassland will depend on the way in which it is implemented on the ground. A recent study in showed that in the UK the effectiveness of the EIA regulations (Agriculture) were difficult to judge but that only a small number of screening applications were received each year in the UK regions (Baldock *et al*, 2013[62]).

The designation of ESPG, both within and outside Natura 2000 areas is likely to bring some additional environmental benefits – biodiversity, carbon, soil and water benefits - given the ban on ploughing of these areas. The actual impact will depend on the proportion of land designated and the criteria used for designation. For example, the criteria used in France has meant that pastures containing protected species are only protected if they are species diverse. If only one species is present, even if it is present in abundance the pasture will

[62] Baldock, D., Desbarats, J., Hart, K., Newman, S., and Scott, E. (2013) "Assessing Scotland's Progress in the Environmental Agenda". Institute for European Environment Policy: London.

remain unprotected. It is particularly positive to see the number of Member States which have designated all their Natura 2000 permanent grassland as ESPG and that four Member States have chosen also to protect sensitive grasslands outside the Natura 2000 network.

For those Member States which have designated less than 100% of permanent grassland within Natura 2000 areas, it will be important to assess why this is the case. In some countries (e.g. the case of the UK - Scotland) there were valid environmental reasons for only designating a proportion of the area. However, anecdotal evidence from Scotland (and other countries, such as Estonia) suggests that the availability of sufficiently accurate mapping data to allow payments to be controlled may also have influenced the types of permanent grassland designated as environmentally sensitive (*pers.comm*).

Some have argued that the protection offered by ESPG is no more than that already required under the birds and habitats directives. However, the fact that the protection of the ESPG is subject to a payment and therefore strict controls, also means that implementation and adherence to the no ploughing rules are likely to be carried out to a greater degree than might be the case otherwise, due to the higher levels of control and the risk of loss of CAP payments for non-compliance.

4 Crop diversification

The rules for the crop diversification greening measure are set out in Annex 1. In broad terms, this measure:

- requires farms with between 10 and 30 ha of arable land to plant a minimum of two crops and that the main crop does not cover more than 75 % of that arable land;
- requires farms with more than 30 ha to have a minimum of three crops, each occupying more than five per cent and with no one crop occupying more than 75 per cent of the arable area.
- Does not apply to farms with less than 10 ha of arable land.

As with the EFA measure, there are also a number of exemption criteria for eligible farms which exclude a large proportion of arable farms in the EU (see Annex 1).

The stated objective for the crop diversification measure is to achieve 'enhanced environmental benefit…in particular the improvement of soil quality' (recital 41 of Regulation (EU) 1307/2013).

4.1 Member State implementation choices

The rules for the crop diversification measure are straightforward, with no flexibilities given to the Member States in terms of choosing how to implement it. However, this is one of the measures that has caused some Member States concern in terms of the implications for farmers. During the CAP reform negotiations, both farming and environmental stakeholders had argued for a crop rotation measure rather than crop diversification, which would have been more practical to implement and have clearer environmental benefits. However, this was rejected at an early stage due to problems of control and verification under the annual payment system operated under Pillar 1. It is not surprising then that, where equivalent practices have been introduced, it is most frequently for this measure. For example France has introduced a certification scheme for single crop maize producers (see below) and Austria, Ireland and Poland have introduced equivalent practices via their agri-environment-climate schemes for this measure. Although Poland was one of the countries reviewed for this study, it has not been possible to source any information on the details of how the equivalent practice for crop diversification has been implemented via its agri-environment-climate scheme.

4.2 Equivalent practices via a certification scheme in France

A certification scheme has been developed for single crop maize producers in France covering all three greening measures. However, the requirements of the scheme only differ in relation to the crop diversification measure, with the standard rule applying for the other elements (maintaining permanent pasture and EFAs).

Farmers signing up to the scheme are permitted to put in place winter soil cover via green cover from a sown crop on all of their arable land and this is treated as equivalent to the

standard crop diversification measure (see Box 4). The certification scheme was accepted by the Commission as it establishes 'winter soil cover', which is one of the possible greening equivalent practices listed in Annex IX of the direct payments regulation (1307/2013).

The original proposal for an equivalence scheme for single crop maize as an alternative for crop diversification was initiated by AGPM, the French association of maize producers (Association Générale des Producteurs de Mais) and the European Confederation of Maize Production (CEPM). In its original form it had proposed that shredding and mulching maize residues should be considered an equivalent practice, arguing that sowing a cover crop can be difficult when maize harvests are late and that mulching residues can achieve the environmental aims of greening as it provides cover, ensures nitrogen fixers and organic matter go into the soil and helps control insect pests and fungal diseases (Hutchison, 2015). However, although this could have been beneficial from a climate perspective, this did not fit within the rules for crop diversification, which requires green cover to be provided via a sown crop.

Box 4: Certification scheme for single crop maize producers in France (2015)

Aim: The certification scheme is targeted at single crop maize producers in France and covers all three greening measures. The standard rules for the maintenance of permanent pasture and Ecological Focus Areas (EFAs) apply, but for crop diversification, it gives farmers the option to meet the greening requirements by growing a winter green cover on land used for monoculture maize production[63],[64]. The equivalence scheme is voluntary and is subject to certain conditions (see below).

Eligibility criteria: farm holdings with more than 10ha of arable land, of which 75% is dedicated to maize (*zea*) production (all species are valid). The scheme is available in any region in France.

Equivalence conditions:

- A winter green cover must be planted on 100% of the farm's arable land;
- The green cover must be planted no later than 15 days after maize harvest on year *n* and be maintained at least until 1 February of year *n+1*.
- There are no rules relating to the sowing or management of the green cover but there is a result-based obligation that the planted green cover must germinate and grow[65].
- The green cover *cannot* count as EFA 'catch crops'.
- The winter green cover must be composed of one or more of the following plant species:
    - Grass (*Poaceae*): oat, wheat, cocksfoot/orchard grass, fescue, timothy, barley, bluegrass, ryegrass, rye, triticale, x-Festulolium;
    - Others: phacelia, flax, turnip rape; faba beans, fenugreek, chickling vetch, lentils, birdsfoot trefoil, lupine (white, blue, yellow), alfalfa, black medick, sweet-clover, peas, chickpeas, sainfoin, common birdsfoot, clovers, vetch.
- The standard rules for the maintenance of permanent pasture and EFAs apply.

Given the environmental objectives underpinning the scheme, the farmers are encouraged not to apply mineral fertilisers or remove the cover mechanically, but this is not mandatory. The winter green cover should also comply with the requirements of the Nitrates Directive (i.e. with the additional obligations applicable in Nitrate Vulnerable Zones).

[63] http://agriculture.gouv.fr/sites/minagri/files/documents/pdf/Paiement_vert_-_schema_certification_mais_cle4666ca.pdf

[64] http://www.lafranceagricole.fr/actualite-agricole/mais-pac-la-couverture-hivernale-acceptee-par-bruxelles-100590.html

[65] http://www.agpm.com/pageLibre00012f24.php

Controls: Farmers are subject to two types of controls:

- From an independent certification body (controls have been awarded to an agency called OCACIA) that verifies farmers' compliance with the maize certification scheme. The scheme, and hence the controls, cover all 3 greening obligations.
  All applicants will receive a first on-farm inspection in autumn 2015. After that, 1/3 of certified farms will be controlled between 15 November and 1 February every year while 100% of farms will be subject to annual paper-based audits. OCACIA certification is valid for a period of 3 years.
- From the Payment and Services Agency: in addition to the above, 5% of farms adhering to the maize certification scheme will be subject on-farm inspections by the national paying agency.

Sanctions: If the independent certification body observes total or partial non-compliance, this is reported to the local services of the Ministry of Agriculture (at the level of the *département*) which then follow the general procedure and rules in case of non-compliance for the crop diversification element of the greening measures.

NB: The proposal by the French government initially included an additional derogation which was rejected by the EC: this was the possibility to remove the green cover as soon as 15 December in clay soils (e.g. Alsace) to allow ploughing, or in case of floods in the South West of France.

4.3 Potential environmental implications

The crop diversification measure has the potential to bring modest benefits for biodiversity, particularly if it encourages greater rotation of crops, including the introduction of fallow or legumes into the rotation. Benefits for biodiversity are likely mainly to be in relation to common and widespread species, due to improvements in soil biodiversity and overall invertebrate populations. If leguminous crops are allowed to flower then this could benefit pollinating insects. As with the EFA measures, any environmental benefits will be context specific and highly dependent on the management of the crops. This will depend on the actual decisions taken by farmers in the 2015 cropping year.

There are significant variations in the estimates of the area of arable land and the number of farms that are subject to the crop diversification measure. This is due to the fact that agricultural statistics in the public domain do not break down their data in the categories needed to determine both the number of farmers and farms that are eligible but exempt according to the range of exemption criteria that exist. Pe'er *et al* (2014)[66] estimated that 48 per cent of UAA and 13 per cent of arable land is likely to be exempt from the crop diversification measure. However, for the countries studied here the estimates of farms and areas of land exempt from the crop diversification measure suggest a broad range:

- In Italy, it has been estimated that 72 per cent of the arable area and 93 per cent of arable holdings will be exempt from crop diversification[67];

[66] Pe'er G, Dicks LV, Visconti P, Arlettez R, Báldi A, Benton TG, Collins S, Dieterisch M, Gregory RD, Hartig F, Henle K, Hobsoon PR, Kleijn D, Neumann RK, Robijns T, Scmidt J, Shwartz A, Sutherland WJ, Turbé a, Wulf F, Scott AV (2014) EU Agricultural reform fails on biodiversity: Extra steps are needed to protect farmed and grassland ecosystems, Science, Vol 344, Issue 6188, 6 June 2014

[67] Elaborations on ISTAT (2010), 6th Agricultural Census. From: F. Vanni and C. Cardillo (2014) . "The effect of CAP greening on Italian agriculture", *International Journal of Agricultural Policy,* PAGRI 3/2013

- In the Netherlands, 24.3 per cent of the arable area and 6.6% of arable holdings will be exempt[68]; and
- In Romania estimates suggest that 37% of the arable area and 98 per cent of arable holdings will be exempt.

It will not be possible to verify the accuracy of these figures until an assessment is carried out of CAP payment claims via IACS for 2015.

Even where farms are subject to crop diversification requirements, many farmers will already meet the requirements. For example, in France a study carried out in 2012 (on the Commission's original proposals), found that 94 per cent of arable holdings with more than 12 hectares of land already had three different crops on their land between 2007 and 2009. The single crop maize growers in the south of France were the exception to this, hence the introduction of the equivalent certification scheme. The regulatory impact assessment undertaken in advance of the implementation of the new CAP rules in Wales (UK), estimated that '86% of farms of 20ha or more could comply with the default greening requirements without significantly changing their operations. For farms smaller than this, the figure rises to 98%'.[69] These high figures in Wales also indicate the very low proportion of arable land in the country.

These figures would suggest that the crop diversification measure is unlikely to lead to a significant increase in crop diversity in the EU-28 overall compared with the situation in 2014. However, in certain regions or amongst certain specialist crop producers, more significant changes to cropping patterns may be required. Where equivalent practices have been introduced within agri-environment-climate schemes, it will be interesting to see the extent to which these options are taken up as a means of complying with the greening requirements. It will also be important to assess the implications of this on agri-environment scheme budgets and how this impacts upon the budget available for and uptake of other, more demanding and environmentally beneficial agri-environment-climate measures in arable areas.

[68] pers. Comm.
[69] http://www.assembly.wales/laid%20documents/sub-ld10176-em/sub-ld10176-em-e.pdf (page 8)

5 Changes in cross-compliance and Rural Development Programmes

In order to be able to assess the extent to which the implementation choices of Member States for greening are likely to lead to any environmental additionality, their relationship with what is required by other CAP measures also must be considered. Of particular interest are the relationships with cross-compliance standards of Good Agricultural and Environmental Condition GAEC), but also the interaction with rural development agri-environment-climate schemes.

For cross-compliance it is important to compare the GAEC standards for 2014-2020 with the previous system e.g. those in place since the CAP Health Check in 2009. Since some of the previous standards have been incorporated into the new green direct payments, it is important to understand what is being delivered additionally via the new greening measures.

The relationship with Pillar Two measures also is critical. One of the original rationales for including broad green measures in Pillar 1 was that this would free up resources within rural development programmes to spend on more targeted agri-environment-climate (AEC) measures. In order to assess the extent, to which this has happened in reality it would be necessary to look at Member States' agri-environment-climate schemes for 2015-2020 and compare the measures included with those implemented in the 2007-13 programming period. However, given the (delayed) timing of RDP approvals and the lack of information on the content of the new AEC schemes in the public domain, it has not been possible to carry out this assessment here. This is something that will be required if a full assessment of the potential environmental additionality of the greening measures is to be carried out.

5.1 Cross-compliance

Cross compliance comprises a set of conditions for receipt of both direct payments in Pillar 1 and agricultural area payments under Pillar 2. Its purpose is to contribute to the 'development of a sustainable agriculture through a better awareness of beneficiaries of the need to respect basic standards [and] to make the CAP more compatible with the expectation of the society through a better consistency of that policy with the environment, public health, animal health, plant health and animal welfare policies'. There are two components:

- Statutory Management Requirements (SMRs) require adherence to certain provisions of EU Directives relevant to agricultural land management.
- Standards of Good Agricultural and Environmental Condition follow general principles laid down in EU legislation but are specified at the national or regional level by Member States' own authorities.

There tend to be significant differences between the specific rules applied in different countries.

5.1.1 Changes in cross-compliance GAEC standards for 2015

The new GAEC standard framework is set out in Annex II of the CAP horizontal regulation (Regulation (EU) 1306/13). The main changes in the GAEC framework for 2014-2020 compared with the previous period are that all standards are now compulsory, whereas some previously were optional; and the standards have been consolidated into a reduced list, with some of the previous standards now subject to payments via green direct payments. For example the maintenance of permanent grassland is now a green measure, standards for crop rotations have been superseded by the crop diversification measure, and some of the content of soil standards in some countries, such as catch crops and green cover has become incorporated into EFAs.

In addition, one GAEC standard has been slightly enhanced. The GAEC standard to protect landscape features now includes an additional requirement to ban the cutting of hedges and trees during the bird breeding and rearing season.

A comparison between the current and previous GAEC frameworks is set out in Table 10.

Table 10: GAEC Standards in the area of environment, climate change, good agricultural condition of land – a comparison of pre-2013 with the current situation

Issue	Compulsory / Optional	2009-2013	2015-2020	
Water	Compulsory	Establishment of buffer strips along water courses	Establishment of buffer strips along water courses	GAEC1
		Where use of water for irrigation is subject to authorisation, compliance with authorisation procedures	Where use of water for irrigation is subject to authorisation, compliance with authorisation procedures	GAEC2
		Previously an SMR	Protection of ground water against pollution: prohibition of direct discharge into groundwater and measures to prevent indirect pollution of groundwater through discharge on the ground and percolation through the soil of dangerous substances, as listed in the Annex to Directive 80/68/EEC in its version in force on the last day of its validity, as far as it relates to agricultural activity	GAEC3
Soil	Compulsory	Minimum soil cover	Minimum soil cover	GAEC4
		Minimum land management reflecting site-specific conditions	Minimum land management reflecting site specific conditions to limit erosion	GAEC 5
		Arable stubble management	Maintenance of soil organic matter level through appropriate practices including ban on burning arable stubble, except for plant health reasons	GAEC6
	Optional	Retain terraces	*[incorporated into GAEC7]*	

		Standards for crop rotations		
		Appropriate machinery use (maintain soil structure)		
Landscape	Compulsory	Retention of landscape features, including, where appropriate, hedges, ponds, ditches trees in line, in groups or isolated and field margins	Retention of landscape features, including where appropriate, hedges, ponds, ditches, trees in line, in groups or isolated, field margins and terraces, and including a ban on cutting hedges and trees during the bird breeding and rearing season and, as an option, measures for avoiding invasive plant species.	GAEC7
		Avoiding the encroachment of unwanted vegetation on agricultural land	*[Incorporated into definition of eligible agricultural land]*	
		Protection of permanent pastures	Protection of permanent pastures in 2015 and 2016	
	Optional	Minimum livestock stocking rates or/and appropriate regimes	*[Incorporated into definition of eligible agricultural land]*	
		Establishment and/or retention of habitats		
		Prohibition of the grubbing up of olive trees		
		Maintenance of olive groves and vines in good vegetative condition		

Source: Regulation (EU) 73/2009 and Regulation (EU) 1306/2013

5.1.2 Changes in selected Member States

A comparison of the previous and current GAEC standards put in place in the Member States reviewed for this report show that overall very little change has occurred in practice. An overview of the key changes in selected Member States[70] is set out below:

- *Germany:*
  - The water GAEC standards (1-3) are the same as previously.
  - Under GAEC6, the only requirement is the prevention of arable stubble burning, with the other Soil Organic Matter (SOM) requirements included under greening (under maintenance of permanent grassland, crop diversification and the catch crops element of EFA) and under Pillar2
  - All landscape features under GAEC7 are also eligible to count as an EFA. A ban on hedge cutting has been introduced: 1 March – 30 Sept

- *Hungary:*
  - The water GAEC standards (1-3) are the same as previously
  - Under GAEC5, Jerusalem artichoke has been removed from the list of crops that cannot be produced on steep slopes > 12%. The protection of land terraces in

[70] For France, Italy, Poland and Romania, no information was provided by the case study experts to allow an assessment to be carried out.

vineyards has been made obligatory and incorporated into this standard (separate GAEC previously)
    - GAEC6 combines the previous crop rotation and arable stubble management requirements
    - GAEC7: ponds have been added to the list of landscape features protected;
    - The ban on machinery use on waterlogged soils has disappeared

- Netherlands:
    - The water GAEC standards (1-3) are the same as previously
    - The soil GAEC standards (4-6) are the same as previously
    - The previous standard setting rules for crop rotations has been replaced by a combination of GAEC4, crop diversification and the EFA nitrogen fixing crops option;
    - GAEC 7: a ban on hedge cutting has been introduced: 15 March – 15 June

- Spain:
    - The water GAEC standards (1-3) are the same as previously
    - GAEC4: more detailed requirements have been put in place in relation to soil cover on rainfed arable land
    - GAEC5: there has been an increase in the slope gradient (from 10-15%) on which there is a ban on cultivating arable crops in line with the slope
    - GAEC6: only includes the arable stubble management requirements from the previous standard
    - GAEC7: the retention of rock terraces has been moved into this standard and a hedge cutting ban has been introduced: March – July
    - The ban on machinery use on waterlogged soils has disappeared
    - Previous standards relating to the pruning and grubbing up of olive trees have disappeared
    - Under the previous optional standard for the establishment and/or retention of habitats there was a requirement not to leave waste materials or apply phytosanitary products, fertilizers, purification sludge, compost or manure to areas that are flooded or snow-covered or where they can run into running or stagnant waters – this standard has also been removed.

- UK (England)
    - The water GAEC standards (1-3) are the same as previously, although there appears to be more detailed guidance
    - GAEC4: the previous requirement to carry out a Soil Protection Review (SPR) has been replaced by a requirement to take 'reasonable steps' to tackle soil degradation threats
    - GAEC5: the SPR has been replaced by a requirement to put measures in place (from a list of suggested actions) to limit soil and bankside erosion
    - GAEC6: amalgamates a number of previous GAEC standards requiring compliance with national legislation on: Crop Residues (Burning) Regulations; Heather and Grass Burning Regulations; and EIA (Agriculture) Regulations
    - GAEC7: some small changes to the content of this standard – e.g. the removal of stone from dry stone walls is now prohibited, but the requirement to establish a

2 metre margin from a hedge has been removed. A ban on hedge and tree cutting has been introduced from 1 March to 31 August.

- UK (Northern Ireland)
  - The water GAEC standards (1-3) are the same as previously, although the rules for buffer strips under GAEC1 have been made more specific
  - GAEC4: similar requirements to previously, but now also incorporates the previous crop rotation standard
  - GAEC5: Similar requirements to previously, but incorporates the previous standard for appropriate machinery use
  - GAEC6: Incorporates the previous rules on arable stubble management, appropriate machinery use to maintain soil structure and compliance with the EIA (Agriculture) Regulations.
  - GAEC7: no real change to content, although a ban on hedge, tree or scrub cutting has been introduced from 1 March - 31 August. The restrictions on invasive species have been included (one of the few countries reviewed to do so).

- UK (Scotland) –
  - Under GAEC 1, a new rule has been introduced, preventing cultivation and pesticide use within 2m of the top of the bank along watercourses or from 2m of centre line of a hedge;
  - The water GAEC standards (2-3) are the same as previously
  - GAEC4 is very similar in content to previously
  - GAEC5: has become less detailed - farmers are required to 'put in place appropriate measures to limit soil erosion' in place of previous specific requirements relating to wind erosion and soil capping
  - GAEC6: a new standard has been introduced to prevent the burning of arable stubbles which were not in place previously, also it includes the rules relating to adherence to the EIA (Agriculture) Regulations and the Muirburn code.
  - Rules on appropriate machinery use and the standard on crop rotations have disappeared.

- UK (Wales):
  - The water GAEC standards (1-3) are the same as previously
  - GAEC4: The previous soil assessment record has been replaced by rules to protect soil by ensuring cover by crops/stubbles/residues/other vegetation at all times.
  - GAEC5: this now includes the standard for appropriate machinery use as well as rules on overgrazing to avoid poaching.
  - However, previous supplementary feeding rules appear to have disappeared.
  - GAEC6: amalgamates a number of previous standards, including a ban on burning crop residues and the requirement to comply with national legislation: Heather and Grass Burning Regulations; and EIA (Agriculture) Regulations
  - GAEC7: Largely similar to previously, with the ban on hedge cutting (and tree and scrub in some regions) dates extended by one month: now 1 March – 31 August

5.2 Rural Development Programmes

One of the original aspirations for introducing basic, greening measures broadly applicable to farms throughout Europe under Pillar 1 was that this would free up resources within Rural Development Programmes to focus on more targeted and 'deeper green' agri-environment-climate measures (AECM). This in turn would help to ensure that re-designed agri-environment-climate schemes could engender a real improvement in the farmed environment, rather than spending a considerable proportion of their resources on "broad and shallow" measures that tend to be designed to help stem environmental declines in the wider countryside.

During the extended reform process in recent years, two issues arose that have made it less likely that this original aspiration might transpire in practice. Firstly, the budget for rural development policy was cut to a proportionately larger extent than the Pillar 1 budget for 2015 onwards. This has meant that Member States have lower budgets from which to fund all rural development priorities, of which environment and climate priorities form only part. Secondly, the greening measures themselves were expanded in scope and flexibility, particularly the EFA measure, and numerous exemptions to the measures were introduced. This has had the result that Member States have had a lot more freedom to decide how farmers can meet their EFA obligation and, as was seen in chapter 2, many Member States have chosen to offer farmers the greatest flexibility possible. It also meant that a much lower proportion of land is affected by the requirements of the greening measures than was originally intended.

The potential effect of these changes is that the relatively basic uplift in environmental management of the wider farmed countryside that it had been anticipated that greening would provide, is unlikely to transpire, at least on a significant scale, particularly on arable land. Consequently, the AECM will need to continue to play this role. In some cases, where the EFA and crop diversification measures apply, there will be some resources freed up within agri-environment-climate schemes, given the need to avoid double funding. However, given the assessment of Member States choices for the greening measures, it is surmised that any such savings are likely to be at the margins and Member States may not have used these savings to increase the AECM budget.

As noted in the introduction, it has not been possible in this study to assess the interaction between the greening measures introduced and the content of Member State and regional agri-environment-climate schemes. The timing of the approval of many Rural Development Programmes (RDPs) meant that information was not available at the data gathering phase of this study. In many cases, even once the RDPs have been approved, these are still not available in the public domain. The main information sources published are the summary fiches available on the DG Agriculture website which do not provide the detailed information on the content of agri-environment-climate schemes which would be needed to carry out this sort of assessment.

Information available to date shows that 43 per cent of funding has been allocated to priority 4 'Restoring, preserving and enhancing ecosystems related to agriculture and

forestry[71], although of this only 16 per cent is allocated to the AECM, with the majority used to support farming within Areas of Natural Constraint (ANC), which have no environmental conditions attached. An analysis of data available for the countries reviewed for this study comparing agri-environment allocations in 2007-13 with those for 2014-2020, show declines in total expenditure on this measure for a number of Member States. Although it has not been possible to ascertain the way in which schemes have changed in terms of their priorities or targeting, such declines are certainly cause for concern and need further investigation. The RDP approval process is incomplete as yet for three of the countries reviewed (France, Italy and Spain) and therefore the data available are only partial.

Table 11: Comparison of agri-environment expenditure allocated in 2007-13 and 2014-2-2020

Member State	Agri-environment budget 2007-2013 (€billion)	Budget for agri-environment-climate + organic farming measures 2014-2020 (€billion)	% change 2007-13 to 2014-2020
France	3.01	1.09 so far (10 of 30 RDPs)	
Germany	4.1	3.78	-8%
Hungary	1.13	0.85	-25%
Italy	3.65	1.53 so far (11 of 23 RDPs)	
Netherlands	0.33	0.41	+24%
Poland	2.10	1.85	-12%
Romania	1.44	1.31	-9%
Spain	2.3	1.37 so far (13 of 19 RDPs)	
UK	3.69	3.73	+2%

Source: own calculations based on DG AGRI RDP Factsheets for 2014-2020 and financial target reporting for 2007-13.

The information provided by Member States about the targets set against various indicators, shows that 19% of EU farmland will be under biodiversity management by 2020, 15% under soil management, 15% under better water management and 7% under agreements to reduce GHG/ammonia[72]. These estimated areas could relate to a number of measures, not just the agri-environment-climate measure and it is not yet clear how these figures relate to the final figures achieved for the the previous programming period.

At this basic level these figures tell us very little about the likely environmental impact of the AECM in different parts of the EU and nothing at all about the content of the AECMs in different Member States and their relationship with the three greening measures. A detailed assessment is needed to compare the objectives and precise content of the AECM schemes being implemented from 2016 onwards with those that were in operation in 2007-13 to understand the nature of the changes that have taken place and to facilitate an analysis of their relationship with the greening measures.

[71] Presentation by Mihail Dumitriu at the ENRD Contact Point's Seminar on Improving Rural Development implementation, 11 June 2015 http://enrd.ec.europa.eu/sites/enrd/files/uploaded-files/s2_state-of-play_dumitru.pdf

[72] ibid

6 Conclusions

The question that this report has sought to answer is the extent to which the introduction of the greening measures under Pillar 1 is likely, in practice to lead to greater environmental ambition on agricultural land following the adoption of implementation measures for the 2014-2020 period compared to 2007-13. The analysis examined the detailed implementation choices for the three greening measures in 2015 in nine countries (FR, DE, ES, IT, HU, NL, PL, RO, UK) and reviewed the way in which cross-compliance GAEC standards had changed from the 2007-13 period. Insufficient evidence was available to be able to assess the interaction of the greening measures with agri-environment-climate schemes under rural development policy or the extent to which their introduction has changed the design of AEC schemes.

Some of the key points to emerge are set out below.

The new cross-compliance framework has not led to significant changes overall in the environmental issues being addressed in the countries examined for this study. However, the re-brigading of previous standards within the new framework or within other parts of the CAP affects several standards with consequences for both the number of farms concerned and the framing of the policy. For example the minimum agricultural activity standards are now included under the eligibility criteria for the basic payment scheme, the maintenance of the ratio of permanent grassland to total agricultural area has become one of the greening measures, and standards for catch crops, green cover and N fixing crops have sometimes been included within GAEC standards as well as the EFA and crop diversification greening measures. Sometimes these have been removed from GAEC so that they now apply only via the greening measures.

There are positive and negatives to this sizeable shift of actions between cross-compliance and greening measures. Although GAEC standards apply across the whole farmed landscape, the extent to which they are adhered to in practice can be variable. The shift of some of these standards to greening means that (with the exception of the maintenance of permanent grassland) they will apply on a much smaller proportion of land and with considerable variations between Member States. However, the fact that the requirements are related to a payment, with the more stringent controls that are associated with these, means that higher levels of compliance may occur in practice.

In relation to greening, the first issue to raise is that, due to the area threshold and range of exemptions that are in place for the EFA and crop diversification measures, the areas of arable land and numbers of farms affected are rather low in a number of the countries reviewed. In Italy, up to 50 per cent of arable land is unaffected by the EFA measure and 72 per cent unaffected by the crop diversification measure. Proportions of between 20-40 per cent are common in other countries. The small size of farms in some Member States is the principal explanation for this. Permanent grassland is better protected as the measure does not have exemptions applied to it in the same way.

The flexibility available to national authorities for implementing the greening measures, particularly in the EFA measure, but also for the implementation of the permanent grassland measure, offers considerable opportunities to tailor the greening measures to address particular environmental priorities and needs within Member States and to provide a solid foundation on which agri-environment-climate schemes under Pillar 2 could build. However, the options available do not appear to have been used to create a distinctive overall increase in environmental ambition. Rather the pattern amongst many of the Member States reviewed, has been to offer farmers maximum flexibility in terms of implementation and therefore increasing the likelihood that farmers will be able to meet the requirements already with very few changes in established management required.

Within the context of the EFA this has involved constraining the potential changes required at farm level by allowing a high number of the potential EFA elements to fulfil the obligations, allowing production and the use of inputs on EFA land wherever this is permitted (e.g. permitting N fertiliser and plant protection products on N-fixing crops, permitting production on strips along forest edges etc) and in some cases only including those features already protected under cross-compliance as eligible for the payment.

For the maintenance of permanent grassland this limited ambition is illustrated by the fact that most Member States have chosen to implement the ratio at a national level and no Member States have opted for farm level implementation. In addition a number of countries have designated only a very small proportion of their land within Natura 2000 areas as environmentally sensitive and only four countries have chosen to designate ESPG outside Natura 2000 areas (CZ, LU, LV and UK (Wales)).

However, there are also some interesting examples of positive implementation choices being made with rather more environmental ambition. For example, some Member States have chosen to:

- Include only additional landscape features to those protected under cross-compliance as eligible for the EFA
- Restrict fertiliser and pesticides use on N-fixing crops (only NL amongst the countries reviewed here)
- Put in place conditions on the crops that must follow N-fixing crops to prevent N leaching (ES and DE)
- Only include strips along forest edges where no production is permitted (only DE in the countries reviewed)
- Not use conversion factors for strips along forest edges where production is permitted, thereby making strips without production more attractive
- Introduce a permit system (e.g. in DE) for approving the conversion of permanent grassland to arable, with the requirement in most situations to demonstrate that an equivalent area is becoming permanent grassland elsewhere in the region.
- Designate large proportions of ESPG with Natura 2000 areas
- Designate areas of ESPG outside Natura 2000 areas (4 Member States)
- Introduce equivalent practices (particularly the example of the NL of the countries reviewed here). This has allowed the objectives of the EFA measure to be applied in a more focussed and targeted way that is suited to the situation in the NL.

Nonetheless, on the areas of farmland where action is required, the evidence suggests that many farmers already meet the requirements for EFAs and crop diversification, so the chances of environmentally enhanced management appear limited. In Wales (UK) for example, it has been estimated that 86% of farms of 20ha or more could comply with the default greening requirements without significantly changing their operations and that for farms smaller than this, the figure rises to 98% (although this high figure also reflects the low proportion of arable land in the country). This sort of information is not available as yet for most countries and further quantification will be required once the actual situation is clearer i.e. when data on the choices made on the ground by farmers become available.

The rationale for the choices made by Member States is not very explicit in most cases but this is a topic where more work is required. In some countries it may be the case that politically it was not considered appropriate to make the greening requirements more demanding than they needed to be, particularly in the first years of the new policy when so many other changes to Pillar 1 payments were being introduced. The reactions of producer groups and concerns about impacts on the competiveness of measures above a minimum may have been significant. Linked to this was a clear desire to keep implementation as simple and straightforward as possible, to avoid any unnecessary increases in administrative burden. In many cases, anecdotal evidence suggests that the approach taken has been to include those elements that are most straightforward to implement, control and verify, not only to keep things as simple as possible in terms of implementation on the ground, but also to reduce the risk for national authorities of disallowance.

Overall therefore, despite being a strategic change in direction for the CAP to green Pillar 1, the choices made by Member States for 2015 do not seem likely to lead to major changes in action on the ground for environmental management. On the evidence assembled here it looks as if the greatest impacts may be a greater shift towards the planting of N fixing crops (due to the "triple dividend" of them counting towards EFA, crop diversification and receiving coupled support in most countries). This is already being seen in the north of Italy (Po region). Permanent grassland may be protected to a greater extent than previously, given that its protection is now the subject of a payment (and therefore more stringent controls). Permanent grassland within Natura 2000 areas will have an added layer of protection from that already in place under the Birds and Habitats Directive. However, the area of arable land that is affected by the greening requirements is very low in many countries – and the EFA measure only affects a small proportion of that area (less than 5 per cent once the conversion and weighting factors are taken into account.

This analysis raises a number of questions. Firstly, given the budget devoted to the greening measures (approximately €12.5 billion/year, compared with approximately €14 billion/year for the whole of Pillar 2, only 16 per cent of which is allocated to agri-environment-climate), the question arises as to whether sufficient is being achieved for the environment with the greening budget compared with equivalent expenditure under Pillar 2. Secondly, this leads to questions about whether the Pillar 1 mechanism, with its annualised systems of payments and controls is in practice the most efficient use of resources to incentivise basic environmental management across the wider farmed countryside. Thirdly, it is as yet not known how AEC schemes have developed since the previous programming period to take

account of greening and the extent to which the two elements work together to deliver environmental outcomes, although the declines in allocated expenditure in most countries are a cause of considerable concern – this is an area where further work is needed. Fourthly, it is difficult to ascertain the extent to which the first year of greening is likely to be representative of the implementation of these measures in the future. Since changes to implementation choices can be made every year and lessons can be learned from the experiences in other countries, improvements could be made over time. Linked to this is the issue as to how far legitimate fears of disallowance have driven a risk averse and less environmentally effective approach by Member States and whether this is avoidable. And finally there is a much broader question with implications for future CAP design and relates to how and whether it is possible to reconcile high levels of Member State flexibility and subsidiarity within Pillar 1 with environmental ambition. These are all questions that will need to be returned to fairly rapidly if their answers are to inform the discussions on revisions to the greening measures in 2017 and the structure and design of the CAP post 2020.

Annex 1 Detailed requirements for the green direct payments

Member States are required to use 30 per cent of their direct payments national ceiling to grant an additional annual payment for compulsory practices which, according to the recitals of the direct payments basic act, should:

- Address both climatic and environmental policy goals;
- be simple, general, annual and non-contractual;
- go beyond cross-compliance[73]; and
- be linked to agriculture[74]

There are three practices identified that can be used to fulfil this requirement:

- Crop diversification
- Maintenance of permanent grassland (including traditional orchards where fruit trees are grown in low density on grassland)
- Ecological Focus Areas

These practices are to apply on the whole eligible area of the holding. There are however several exemptions, including a blanket exemption for land being farmed organically and those participating in the small farmers scheme (in countries where this is offered). Land managers farming land within Natura 2000 sites or river basins covered by the water framework Directive (WFD) are only required to comply with the greening measures insofar as these are compatible with the requirements set under the birds, habitats or water framework Directives. Article 43 (10) states that: '*Farmers whose holdings are fully of partly situated in areas covered by Directives 92/43/EEC, 2000/60/EC, or 2009/147/EC shall be entitled to the payment referred to in the Chapter provided that they observe the practices referred to in this Chapter to the extent that those practices and compatible in the holding concerned with the objectives of those Directives.*'

A series of potential variants for the operation of the green measures is also permitted, including:

- the ability to choose which of the list of potential EFA management practices/features are to be permitted to meet the EFA requirement;
- choices to implement the EFA measure regionally and/or collectively;
- choice about the area of permanent grassland within Natura 2000 areas to designate as environmentally sensitive and whether or not to designate further areas outside Natura 2000;
- to apply 'equivalent practices', either via the agri-environment-climate measure under rural development policy or via a national or regional 'certification scheme';.

The list of equivalent practices has been introduced as a mean of accommodating the diversity of agricultural systems and the different environmental situations across the EU. They are defined as '…those which include similar practices that yield an equivalent or higher level of benefit for the climate and the environment compared to one or several of

[73] It should be noted that, contrary to this objective, the draft delegated act states that certain features protected through cross-compliance can also count towards the Ecological Focus Area requirement

[74] Recital 37 (as above)

the practices referred to in paragraph 2 [the standard practices]'(Article 43 (3). The Regulation includes a list of these equivalent practices in Annex IX (see Table 13). If a Member State wishes to offer the equivalent practices, there are two mechanisms for doing this:

1. As part of commitments undertaken in accordance with agri-environment-climate measures[75]
2. Through national or regional certification schemes, which must go beyond cross compliance requirements (although these schemes need not include equivalent practices)[76]

Double funding of greening practices and those carried out under the agri-environment-climate measure is not permitted. Effectively, on land where the greening measures operate, payments under agri-environment/climate (AEC) agreements would only be made for management that goes beyond the equivalent measures. The precise rules about how double funding should be avoided are to be set out in the delegated act and are still to be agreed at the time of drafting.

6.1 Definitions of the three standard practices and the flexibilities for their implementation

6.1.1 Crop diversification[77]

This measure only applies to farms with more than 10 ha of arable land. Those with between 10 and 30 ha of arable land are required to have a minimum of two crops. Farms with more than 30 ha are required to have a minimum of three crops, each occupying more than five per cent and with no one crop occupying more than 75 per cent of the arable area. In terms of the definition of a crop, the rule is that members of the same botanical genus count as one crop, except for members of the *Brassicacea, Solanacea* and *Curcurbitacea*, where each individual species counts as one crop. An exception to this rule is that winter and spring-sown crops of the same genus count as two distinct crops. Fallow land and grass and other herbaceous forage also count as crops (Article 44(4)).

The delegated act for direct payments (Regulation (EU) 639/2014) (Art. 40) states that the areas of land occupied by the different crops should be calculated for the 'most relevant part of the cultivation period taking account of the traditional cultivation practices in the national context'. It also proposes that where two or more crops are intercropped in rows in one field, they can count as separate crops when they cover at least 25 per cent of the area[78], but where the main crop is under-sown with a second crop the area is considered as covered only by the main crop and if mixed cropping results from the sowing of a seed mixture, that will also only count as one crop.

[75] Those operating under both Article 39(2) of Regulation No 1698/2005 (agri environment payments) or Article 28(2) of the new EAFRD regulation (agri environment climate payments).
[76] As set out in Chapter I of Title VI of the Horizontal Regulation
[77] Article 44 of the direct payments regulation
[78] The share of the different crops of the mixed cropping shall be calculated by dividing the area covered by the mixed cropping by the number of crops covering at least 25% of the area, irrespective of the actual share of a crop in the mixed cropping (Article 41(3)) – document DS/EGDP/2013/16 – rev. 1

The following arable farms are exempt from these rules:

- Farms where > 75 per cent of arable land is used for the production of grasses or other herbaceous forage, land laying fallow, or subject to a combination of these uses, provided the arable area not covered by these uses does not exceed 30 ha
- Farms where > 75 per cent of the eligible agricultural area is permanent grassland, used for the production of grasses or other herbaceous forage or crops under water or a combination of these uses, provided the arable area not covered by these uses does not exceed 30 ha.
- Farms where > 50 per cent of the areas under arable land declared were not declared by the farmer in his aid application of the previous year and, where based on a comparison of the geo-spatial aid applications, all arable land is being cultivated with a different crop compared to that of the previous calendar year
- Farms north of the 62nd Parallel and some adjacent areas (not relevant to Scotland)

6.1.2 Maintenance of Permanent Grassland[79]

Permanent grassland is defined as grassland that has not been included in the crop rotation of the holding for at least five years. The definition has been altered to permit the inclusion of areas of predominantly herbaceous vegetation used for grazing (See Article 4/1(h) of Regulation 1307/2013).

There are two basic requirements on Member States regarding the maintenance of permanent grassland. These are:

- To designate permanent grasslands which are environmentally sensitive provide strict protection to permanent grasslands (i.e. no ploughing or conversion) in areas covered by the Habitats and Birds Directives where this is needed to achieve the objectives of these Directives. These will include grasslands on peat and wetlands in these areas. Member States can choose to designate further areas in need of strict protection. The delegated act (Regulation (EU) 639/2014) sets out a series of circumstances in which permanent grasslands within an area could be given strict protection. These are permanent grasslands:
    - covering organic soils with a high percentage of organic carbon, such as peat land or wetlands;
    - hosting habitats listed in Annex I of Directive 92/43/EEC or protected under national legislation;
    - hosting plant species listed in Annex II of Directive 92/43/EEC or protected under national legislation;
    - being of significant importance for wild bird species listed in Annex I of Directive 2009/147/EC.
    - being of significant importance for wild animal species protected under Directive 92/43/EEC or protected under national legislation.
    - of high nature value as defined by other objective criteria to be established by the Member State.
    - Covering soils with a high risk of erosion.

[79] Article 45 of the direct payments regulation

New areas can also be designated each year.

- To 'ensure that the ratio of the land under permanent grassland in relation to the total agricultural area declared by the farmer…does not decrease by more than 5% compared to a reference ratio to be established by Member States in 2015' (Article 31(2)). This reference ratio will be calculated by dividing the area of land declared as under permanent pasture in 2012 plus the land declared as permanent grassland in 2015 that was not declared in 2012, divided by total agricultural area as declared in 2015 in compliance with the Horizontal regulation. The percentage change in permanent pasture may be calculated at national, regional or appropriate sub-regional level.

The second requirement does not place any specific restrictions on individual farmers unless there is a risk that the five per cent reduction limit is likely to be breached. In that case, holding-level restrictions on conversion from permanent grasslands may be introduced. Also, in situations where the five per cent limit already has been breached, holding-level requirements to reconvert land to permanent grassland may be introduced. The exception to this is where the decrease below the threshold results from afforestation, provided such afforestation is compatible with the environment and does not include plantations of short rotation coppice Christmas trees or fast growing trees for energy production (Article 45 (4) of the basic act).

The delegated act includes rules for these restrictions. These allow Member States to introduce an obligation on individual farmers not to convert permanent pasture without prior authorisation if the ratio is seen to be declining. However, Member States are not obliged to do this. However, if the five per cent reduction threshold is crossed Member States are required to introduce measures to require the re-instatement of permanent pasture and to put rules in place to avoid new conversion of areas of permanent grassland.

6.1.3 Ecological Focus Areas[80]

The requirements of the EFA measure state that holdings with more than 15ha of arable land must maintain at least five per cent of the arable land as ecological focus area. The five per cent limit may be increased to seven per cent, subject to a legislative act of the European Parliament and the Council. A legislative proposal for such an increase can be proposed by the Commission at the same time as it presents an evaluation report on the implementation of the EFA measure. This must be by 31 March 2017. As stated in the recitals of the basic act, '*Ecological focus areas should be established in order to safeguard and improve in particular biodiversity in farms' (recital 37).*

There are a considerable number of exemptions, which reduce the number of farms which must carry out the EFA requirements and consequently the area of land which will be covered by EFA elements. These include:

- Holdings where more than 75 per cent of the eligible area is used for any combination of: permanent pasture, the production of grasses or other herbaceous forage or crops

[80] Article 46 of the direct payments regulation

grown under water for part of the year or crop cycle and where the residual area of arable land does not exceed 30 ha;

- Holdings where more than 75 per cent of the eligible area is entirely used for any combination of: the production of grass or other herbaceous forage, leguminous crops or fallow and where the residual area of arable land does not exceed 30 ha

- In certain circumstances to holdings in Areas with Specific Natural Constraints in countries with more than 50 per cent of the land surface area covered by forests and where the area of forest land is three times larger than the area of arable land.

Member States are given considerable flexibility in deciding what constitutes an EFA. By August 2014 they had to decide which of the following management practices or features[81] they wish to use to help meet the EFA requirement:

- Land lying fallow;
- Terraces;
- Landscape features, including such features adjacent to the arable land of the holding but not included in the eligible area;
- Buffer strips, including buffer strips covered by permanent grassland provided these are distinct from adjacent eligible agricultural area;
- Areas of agro-forestry that receive support under the forestry measures of rural development programmes or that have received support under these programmes;
- Strips of eligible hectares along forest edges;
- Areas with short rotation coppice with no use of mineral fertilizer and/or plant protection products;
- Afforested areas which are still eligible for direct payments;
- Areas with catch crops, or green cover established by the planting and germination of seeds;
- Areas with nitrogen fixing crops.

As highlighted in the descriptions of the potential types of EFA above, not all of these need to be situated within the area eligible for EFAs. For example landscape features and buffer strips covered by permanent grass can be included as long as they are adjacent to the eligible arable area and short rotation coppice and afforested areas do not need to be located on the arable land of the holding (Article 46 (2) of the basic act)

Weighting factors for EFA Management practices

Member States also have the option of applying a series of weighting factors to each of the management practices they decide will be available for farmers to use, which will affect the area needed under different practices to meet the five per cent EFA requirement. The use of weightings are mandatory for any element of an EFA, with a weighting of less than one, ie for types of land management considered to have a relatively low benefit per unit area. The weighting factors are set out in Table 12.

[81] The list included here is as set out in the basic act. The European Commission has delegated powers to identify further types of area that may qualify as an EFA, although it is not clear at this stage if they will do so (Article 30(2)(b))

Table 12: Weighting factors

Features	Conversion factor (m/tree to $m^{2)}$	Weighting factor	EFA area
Land lying fallow (per $1m^2$	n.a	1	1 m^2
Terraces (per 1m)	2	1	2 m^2
Landscape features			
Hedges/wooded strips (per 1m)	5	1.5	7.5 m^2
Isolated tree (per tree)	20	1.5	30 m^2
Trees in line (per 1m)	5	1.5	7.5 m^2
Group of trees/ Field copses (per 1 $m^{2)}$	n.a.	1.5	1.5 m^2
Field margin (per 1m)	6	1.5	9 m^2
Ponds (per 1 m^2)	n.a.	1.5	1.5 m^2
Ditches (per 1m)	3	1	3 m^2
Traditional Stone Walls (per 1m)	1	1	1 m^2
Other features not listed above but protected under GAEC7, SMR 2 or under SMR 3 (per $1m^2$)	n.a.	1	1 m^2
Buffer strips (per 1m)	6	1.5	9 m^2
Hectares of agro-forestry (per 1 $m^{2)}$	n.a.	1	1 m^2
Strips of eligible hectares along forest edges (per 1m) Without production With production	 6 6	 1.5 0.3	 9 m^2 1.8m^2
Areas with short rotation coppice (per 1 $m^{2)}$	n.a.	0.3	0.3 m^2
Afforested areas as referred to in Article 25(2)(b)(ii) (per m^2	n.a.	1	1 m^2
Areas with catch crops or green cover (per 1 m^2	n.a.	0.3	0.3 m^2
Areas with nitrogen fixing crops (per 1 m^2	n.a.	0.3	0.7 m^2

Source: Annex II of Commission Delegated Regulation 639/2014, as amended by Commission Delegated Regulation 1001/2014

Table 13: List of equivalent practices

Greening measure	Equivalent practice	Requirement
Crop diversification	Crop diversification	At least 3 crops, maximum 75% for the main crop, and any one or more of the following: • with at least 4 crops, • with lower maximum thresholds, • with a more appropriate selection of crops, such as, for example, leguminous, protein crops, crops not requiring irrigation or pesticide treatments, as appropriate including regional varieties of old/traditional/endangered crop types (on at least 5% of the rotated area)
	Crop rotation	At least 3 crops, maximum 75% for the main crop, and any one or both of the following: • with a more environmentally beneficial multiannual sequence of crops and/or fallow, • with at least 4 crops
	Winter soil cover*	No specific requirements identified
	Catch crops*	No specific requirements identified
Maintenance	Management of	Maintenance of permanent grassland and any one or more of the

of permanent grassland	meadows/ pastures	following: • Cutting regime/appropriate mowing (dates, methods, limits), • Maintenance of landscape features on permanent grassland and control of scrub, • Specified grass varieties and/ or seeding regime for renewal depending on the grassland type (no destruction of high nature value), • Evacuation of forage/ hay, • Appropriate management for steep slopes, • Fertiliser regime, • Pesticide restrictions
	Extensive grazing systems	Maintenance of permanent grassland and any one or more of the following: • Extensive grazing (timing, maximum stocking density), • Shepherding/ mountain pastoralism, • Using local/traditional breeds for grazing the permanent grassland.
Ecological Focus Area	Alternative forms of ecological management to be applied on at least the percentage of the arable land set pursuant to Article 32(1)	One or more of the following alternative forms of management: • Ecological set-aside • Creation of "buffer zones" for high nature value areas, Natura 2000 or other biodiversity protection sites, including along hedgerows and water courses • Management of uncultivated buffer strips and field margins (cutting regime, local/specified grass varieties and/ or seeding regime, re-seeding with regional varieties, no use of pesticides, no disposal of manure and/or mineral fertilizers), no irrigation, no soil sealing • Borders, in-field strips and patches managed for wildlife/ specific fauna (herbaceous border, protection of nests, wildflower strips, local seed mix, unharvested crops) • Management (pruning, trimming, dates, methods, restoration) of landscape features (trees, hedgerows, riparian woody vegetation, stone walls (terraces), ditches, ponds) • Keeping arable peaty/ wet soils under grass (with no use of fertilisers and no use of plant protection products) • Production on arable land with no use of fertiliser (mineral fertiliser and manure) and/or plant protection products, and not irrigated, not sown with the same crop two years in a row and on a fixed place (*) • Conversion of arable land into permanent grassland extensively used

* Practices subject to the method referred to in Article 29(6)(c) in relation to the payment calculation of related agri-environment-climate actions to avoid double funding.
Source: Annex IX of Regulation (EU) 1307/2013

Annex 2 Summary of rules applying to EFA elements in selected Member States

This table summarise the rules that have been put in place by selected States for their EFA management practices and features.

Table 14: EFA Implementation – Summary of rules for certain EFA elements in selected Member States

MS	Fallow	Terraces	Buffer strips	Forest edges	SRC	Catch crops, green cover	Nitrogen fixing crops
FR	No info	No info	GAEC 1 Width: 5-10 m Riparian vegetation permitted Grazing cutting permitted Other buffer strips: Width 5-10m Grazing/cutting permitted	Width of strips: 1-10m. Management: If production carried out, 1m length counts as 1.8m^2. If no production, then 1m length = 9m^2	Inputs: No mineral fertilisers or PPP permitted No of species on list: 9	Dates: 1 July – 1 Oct Inputs: No restrictions Management: No of species on list:	Inputs: No restrictions Dates: No of species on list: 19
DE	Width: no info Min area: no info	When protected under cross-compliance	GAEC 1 / SMR10 Width: 1-20m Grazing / cutting permitted	Width of strips: 1-10m. Management: No	Inputs: No mineral fertilisers or PPP permitted	Dates: Must be sown between 16 July - 1 Oct.	Inputs: Dates: - Soyabeans, Linseed,

	Dates: no agricultural use until 31 July		Other buffer strips: Width: 1-20m Can be mown or grazed providing distinct from adjacent eligible arable area. Management: No production permitted. Can be prepared for agricultural use from 1 August if to be used for harvest in next year	production permitted	Management: no info No of species on list: 12	Min 2 spp (or undersown with grass). No one spp to be > 60%. Inputs: No mineral fertiliser or PPP. Organic fertiliser permitted. Management: Area can be grazed but only by sheep No of species on list: 90.	Lupins and beans – 15 May – 15 August - All other species: 15 May – 31 August Must be followed by a winter crop or cover crop which must stay in the ground until 15 Feb the following year to avoid nitrate leaching No of species on list: 25
HU	Width: no info Min area: 0.25 ha Dates: Must be fallow at least from 1 Jan - 30 Sept. Management: Can be grazed and cut to keep in good condition	Min height = 1 m.	Only GAEC1/SMR1 / SMR10 Width: 2m strip alongside rivers, 20m strips around lakes Grazing/cutting permitted Other buffer strips: N/A	Width of strips: 1-10 m wide	Inputs: No fertilisers or PPP permitted Management: no info No of species on list: 7	Dates: To be sown after current year's main crop as green manure or winter soil cover. Min 2 spp Management: Must be ploughed in before setting seed. No of species on list: 16	Inputs: ceilings specified in NAPs must be respected. Crops from seed mixtures are permitted as long as they contain at least one species from the list Dates: No of species on list: 17

IT	Width: no info Min area: no info Dates: must be in place for at least 7 months	No info	Only GAEC1/SMR1 / SMR10 Width: 1-5m Strips of riparian vegetation permitted Grazing/cutting permitted Other buffer strips: N/A	No info	Inputs: Management: Max harvest cycle = 8 yrs No of species on list: 5	n/a	Inputs: *Possibly not permitted within NVZs. No fertilisers or PPPs permitted – TO CHECK.* Dates: No of species on list: 21
NL	n/a	n/a	n/a	n/a	Inputs: No mineral fertilisers. PPP allowed Management: No of species on list: 1	Dates: Must be sown before 1 Oct. Must have at least 10 weeks growing period Min 2 species No of species on list: 2	Inputs: No fertiliser use or PPP Dates: No of species on list: 7
PL	No info	n/a	GAEC1 Width: Min 5 m Grazing/cutting permitted Other buffer strips: Width: 1-10m Grazing/ cutting permitted	No info	Inputs: No info on mineral fertilisers. PPP allowed with certain conditions Management: No of species on list: 3	Dates: Must be sown before between 1 July and 10 August (stubble intercrops) or 1 Oct (winter intercrops. Stublle intercrops must be in ground until 1 Oct / winter intercrops must be in ground until 15 Feb. No of species on list: 5 crop families	No info
RO	n/a	Min height = 1 m.	GAEC 1/ SMR1/ SMR10 Width: 1 – 5m (GAEC) or 50 m (SMR).	No info	Inputs: Mineral fertilisers and PPP allowed with limits	n/a	Inputs: Dates:

			Management: Grazing and cutting permitted		No of species on list: 3		No of species on list: 10
ES	Width: no info Min area: no info Dates: must be in place for a t least 9 months from previous harvest between Oct - August	n/a	n/a	n/a	n/a	n/a	Inputs: Dates: Must be in the ground for a min period of time: - Crops for food – to be left until grain is mature. - Crops for fodder - leave until beginning of flowering. No of species on list: 13 Fallow is not permitted. For multi-annual crops, traditional practices must be used. N fixing crops must be followed by a crop needing nitrogen (i.e. not fallow) to avoid risk of nitrogen leaching.

UK E	Width: min 2m Min area: ? Dates: no crops from 1 Jan - 30 June. Temporary grass counts as fallow but no grass seed to be sown. Wild bird seed mixes and nectar sources can be sown - at least 2 crops.	n/a	Both GAEC 1 / and other buffer strips: Width: min 1m Location: must be next to watercourses or parallel to and on a slope leading to a watercourse Management: No production permitted, but grazing and cutting allowed. Sowing wild bird seed mixes or nectar sources is permitted on in-field buffer strips parallel to watercourses	n/a	n/a	September for catch crops, October onwards for cover crops Management: crops chosen as those that give the best chance of: - establishing within the sowing period; - growing quickly; - achieving ground cover; - having different rooting depth types. Sown mix of at least 2 cover types. Grass can be used as long as it was underwown in the previous crop and is sufficiently established. No of species on list: 7	Inputs: No restrictions Dates: Must be in the soil between 1 May and 30 June for inspection. No of species on list: 10 Min area = 0.01 ha.
UK NI	Width: min 2 m Min area: 0.01 ha Dates: must be fallow from 1 Feb - 31 July. Can include green cover. Grass can be cut during fallow period but not removed.	n/a	n/a	n/a	Inputs: No fertiliser or PPP. Management: Max harvest cycle = 5 yrs No of species on list: 10	n/a	Inputs: No restrictions. Dates: Must be present for entire period from 1 June - 31 July. No of species on list: 4

	Wild bird cover seed mix can be counted as fallow as long as not harvested or grazed.						
UK S	Width: ? Min area: 0.01 ha Dates: No production between 15 Jan - 15 July. Management: No topping permitted. Wild flower mixes, wild bird seed mixes and grass are permitted Inputs: Basal fertiliser permitted to support ground cover.	n/a	GAEC1/ SMR1 / SMR10: Width: min 10m Riparian vegetation permitted. Grazing/cutting permitted Other buffer strips: Width: 2-20m. Min 0.01 ha size. • Wild flower mixes, wild bird seed mixes and grass sward are permitted • Grass within a buffer strip can be cut and removed (including for silage and hay) but must be sympathetic to ground nesting birds by avoiding nesting periods	n/a	n/a	Dates: Crop must be established between 1 March and 1 Oct. Management: Catch crop = undersown grass. Green crop cover = min 2 of the crops on the list. Grazing is permitted after the harvest of the main crop. Can be retained later in the season to provide winter cover No of species on list: 7	Inputs: No restrictions Dates: Must not harvest the crop before 1 August in order to protect ground nesting birds No of species on list: 10
UK W	Width: min 2 m Min area: 0.01 ha Dates: Must be	n/a	n/a	n/a	Inputs: No mineral fertilisers permitted (manure, mushroom compost, treated sewage sludge,	N/a	Inputs: No restrictions Dates: Must be present during the growing season

	fallow for at least 6 months Unharvestable seed mixes for wildlife and pollinators are permitted – must include at least two crops				compost are permitted). No PPP – except for spot treatment of invasive non-native species. Only within the first two years of planting. Management: Max harvest cycle = 20 years No of species on list: 9		No of species on list: 17 Can be a single crop or a mix of nitrogen-fixing crops (mix cannot include other crops)

Source: European Commission, 2015; questionnaire responses from Member State experts, supplements by national guidance documents.