

Natural England Joint Publication JP031

# Pilot Results-Based Payment Approaches for Agri-environment schemes in arable and upland grassland systems in England

Appendix 11  
Arable Manual and Guidance

First published 9<sup>th</sup> October 2019

[www.gov.uk/natural-england](http://www.gov.uk/natural-england)



**YORKSHIRE DALES**  
National Park Authority





# Project Details

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

## Project Manager

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## Funding

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# Arable Manual

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# **RBAPS Manual**

Applies to all Results Based Agri-environment Pilot Scheme Agreements in the arable pilot commencing on 15 August 2016

Published August 2016

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## **Introduction**

This RBAPS Manual provides the information needed for applicants and Agreement Holders in the arable Results Based Agri-environment Pilot Scheme (“the Pilot Scheme”) and additional requirements and processes which must be followed.

## **Mandatory elements of the RBAPS Manual**

An RBAPS Agreement will comprise:

1. the Results Based Agri-environment Pilot Scheme Terms and Conditions at Annex 1;
2. the Agreement Document (which sets out Agreement Holder specific details); and
3. the Agreement Map

The RBAPS Manual with the exception of Annex 3 (Guidance on establishing and managing your options) is mandatory and it is a requirement of the Results Based Agri-environment Pilot Scheme Terms and Conditions that you comply with it.

# 1 Background to the Pilot Scheme

## 1.1 Results based agri-environment pilot scheme priorities

The Pilot Scheme is one of three EU funded projects to test whether payment by results as opposed to payment by management i.e. payment based on a set of prescriptions could improve the environmental performance of agri-environment schemes in England. More information on payment by results in the EU can be found at the following link: [http://ec.europa.eu/environment/nature/rbaps/index\\_en.htm](http://ec.europa.eu/environment/nature/rbaps/index_en.htm)

The Pilot Scheme consists of two pilot areas, one in Norfolk/Suffolk covering two arable options and one in Wensleydale covering two grassland options – species rich grassland and habitat for breeding waders.

The aim of the Pilot Scheme is to produce evidence on the following areas:

- Environmental performance of RBAPS
- Accuracy of farmer assessment
- Cost – effectiveness
- Attitudes to RBAPS

The arable element is looking to test the effectiveness of results-based payments to improve the environmental performance of two existing agri-environment scheme arable options:

RBAPS option	Comparable option	
	Environmental Stewardship	Countryside Stewardship
WBF Wild Bird Food	EF2/HF2 Wild bird seed mixture HF12 Enhanced Wild Bird Seed Mixture	AB9 Winter bird food
PN Pollen & Nectar Flower Mix	EF4/HF4 Nectar flower mix	AB1 Nectar flower mix

Winter bird food provides important food resources for farmland birds, especially in autumn and winter. The aim is to provide an abundant and available supply of small seeds during the autumn and winter months for birds and an additional benefit of flowers during the summer for bumblebees, solitary bees, butterflies and hoverflies.

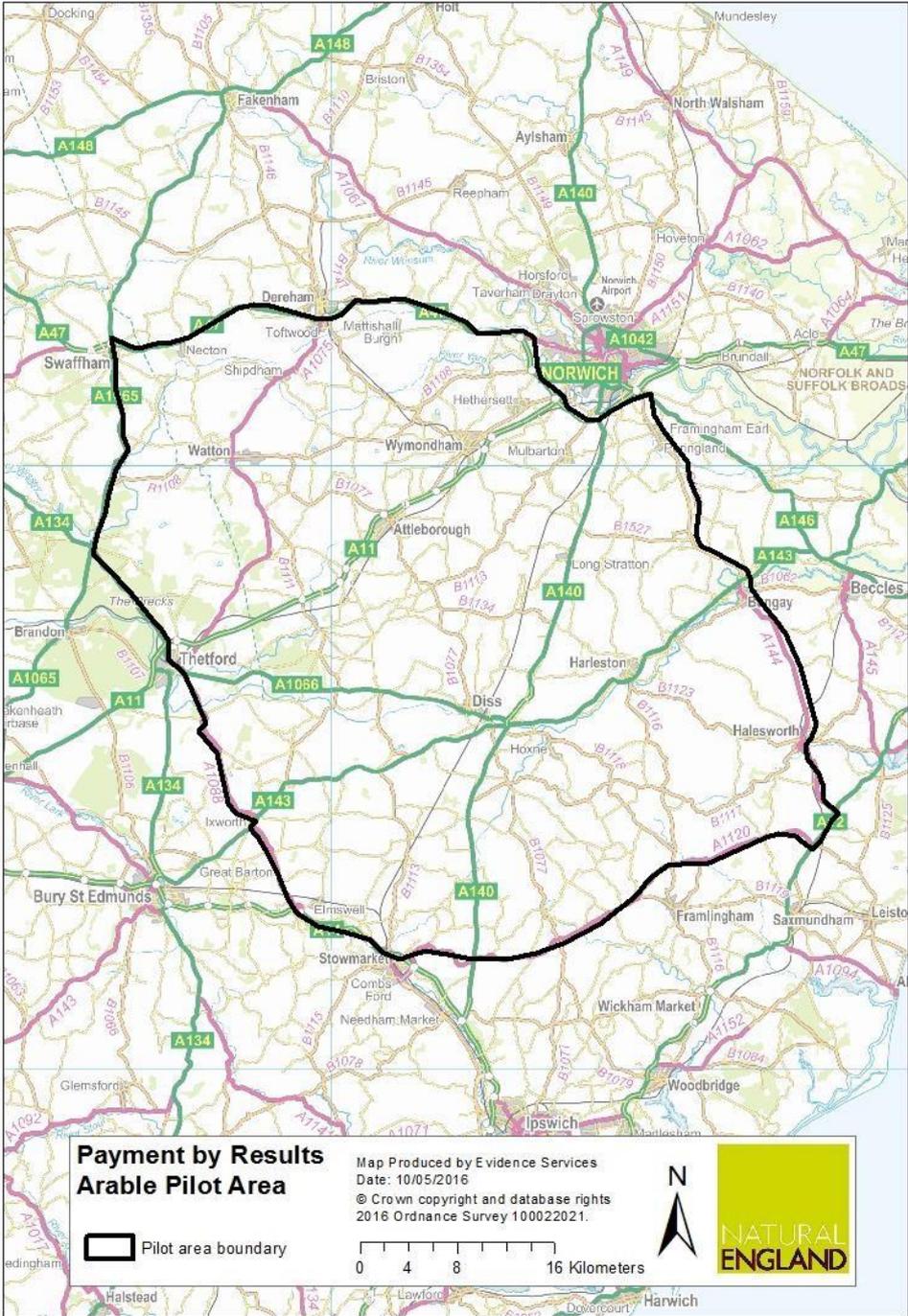
Pollen and nectar provides areas of flowering plants to boost essential food sources for beneficial pollinators between early and late summer such as bumblebees, solitary bees, butterflies and hoverflies.

Results will be based on Self Assessment by the Agreement Holder and an Expert Assessment by Natural England. In addition to the RBAPS plot assessments, assessments will be completed on equivalent habitat on the holding (Baseline) and on holdings that are not participating in the Pilot Scheme, but are within the pilot boundary (Controls). All assessments are completed using the same methodology detailed in Annex 4.

The payment rates for the RBAPS plots will depend on the results achieved and are detailed in Section 1.4. Payment rates are variable (tiered) depending on how well certain results have been delivered on the ground. The 'Results Criteria' for the arable options are the number of sown species established on the plots, the percentage of ground cover for pollen and nectar and the number of seed heads for winter bird food.

### 1.2 Pilot Scheme Boundary

The Pilot Scheme will operate in the following area:



### 1.3 Organisations delivering and funding the Pilot Scheme

The arable Pilot Scheme is delivered by Natural England and co-financed by the European Union.

### 1.4 Results Criteria and Grant payment rates

#### 1.4.1 Winter bird food

The following table is used to calculate the level of Grant payment based on the results from the annual assessment:

All grant payment rates £/ha

Results Criteria: Number of Established Sown Species Producing Seed*	Grant payment rate where 50% or more of plot assessments reach the required plant or seed head threshold
5+	Tier 6 (£842)
4	Tier 5 (£674)
3	Tier 4 (£505)
2	Tier 3 (£337)
1	Tier 2 (£168)
0	Tier 1 (£0)

\* Results will be measured on the presence of the crops detailed in the assessment methodology at (Annex 4).

#### 1.4.2 Winter bird food requirements

- Individual plots have to be a minimum of 0.5ha with a minimum width of 6m.
- Plots have to be retained until 1 February 2018 for the first year (2017) and until 31 December 2018 in the second year (2018) i.e. the Agreement Holder must not materially alter the condition of the plots until those dates. Plots can be moved between the first and second year of the Agreement. **Natural England must be notified and agree in writing the location of the plot before it is sown. The plots must be within the pilot boundary.**

#### 1.4.3 Pollen and nectar

The following table is used to calculate the level of Grant payment based on the results from the annual assessment

For this option, two Results Criteria shall be assessed during the plot Self Assessment (to be completed by the Agreement Holder):

- percentage cover of flowering sown species\*
- number of sown flowering species present

\*Please note for the purposes of the pilot the % cover of flowering sown species will not be assessed during the first assessment in 2017. Therefore the Grant payments in Year 1 (2017) will be based on the number of sown flowering species **only** and an assumed percentage cover of flowering sown species of 90 – 100% (shaded in grey) will be used.

This is primarily to encourage farmers to demonstrate best practice and utilise regular cutting (which would result in a reduced % cover score, Performance Tier and thence Grant payment rate) in the establishment year (typically 12 months after sowing) to control weeds and encourage sown species to tiller and establish better (particularly those flower species that take longer to get established such as bird's-foot trefoil and knapweed). Results and subsequent payments in the first year will therefore reflect successful establishment of the seeds sown.

However, both Results Criteria shall be assessed during the second plot assessment in summer 2018.

All grant payment rates £/ha.

Result Criteria: Number of sown flowering species present	Results Criteria: Percentage cover of flowering sown species * and Grant payment rate					
	0-49	50-59	60-69	70-79	80-89	90-100
5+	Tier 1 (£0)	Tier 6 (£423)	Tier 7 (£494)	Tier 8 (£564)	Tier 9 (£635)	Tier 10 (£705)
4	Tier 1 (£0)	Tier 5 (£353)	Tier 6 (£423)	Tier 7 (£494)	Tier 8 (£564)	Tier 9 (£635)
3	Tier 1 (£0)	Tier 4 (£282)	Tier 5 (£353)	Tier 6 (£423)	Tier 7 (£494)	Tier 8 (£564)
2	Tier 1 (£0)	Tier 3 (£212)	Tier 4 (£282)	Tier 5 (£353)	Tier 6 (£423)	Tier 7 (£494)
1	Tier 1 (£0)	Tier 2 (£141)	Tier 3 (£212)	Tier 4 (£282)	Tier 5 (£353)	Tier 6 (£423)
0	Tier 1 (£0)	Tier 1 (£0)	Tier 1 (£0)	Tier 1 (£0)	Tier 1 (£0)	Tier 1 (£0)

#### 1.4.4 Pollen and nectar requirements

Individual plots have to be a minimum of 0.5ha and must be retained in the same location for the duration of the Agreement.

#### 1.5 When results will be measured

Assessments must be carried out during the following Assessment Windows:

2017

Pollen & Nectar Flower Mixture: 15 June to 15 October

Winter Bird Food: 1 September to 15 October

2018

Pollen & Nectar Flower Mixture: 1 June to 30 September

Winter Bird Food: 1 – 30 September

## **1.6 How results will be measured**

Throughout the duration of the Pilot Scheme there will be a number of surveys of the RBAPS plots to gauge how well the results are being delivered. The first is an annual “Self Assessment” which you as the Agreement Holder will have to undertake during the

Assessment Window. This is followed by an ‘Expert Assessment’ by Natural England which will also take place during the same Assessment Window. Each year a small sample will also be assessed by other Natural England staff not directly involved in delivering the Pilot Scheme to provide independent verification.

All assessments must be completed using the methodology detailed in Annex 4 and at the times detailed in 1.5.

Natural England will inform you of the results of the Expert Assessment as soon as it is complete. You need to inform Natural England within 10 calendar days of completing your Self Assessment.

## **1.7 Baseline Assessment**

In addition to the Self Assessments and Expert Assessments, a Baseline Assessment must also be completed during the Assessment Windows as set out in Paragraph 1.5 in 2017 and (where equivalent plots exist on the holding) in 2018 by the Agreement Holder and Natural England (or its agents or representatives). This Baseline Assessment will be completed on the equivalent options to the RBAPS ones i.e. winter bird food or pollen and nectar that are present in the agri-environment scheme on the farm (see Section 1.1). This provides a baseline of the results delivered by the existing scheme on your farm so Natural England can see whether the RBAPS approach gives any different outcome. You must not do anything that materially alters the condition of the land that the Baseline Assessments will take place on or the items to be measured on it until both the Agreement Holder and Natural England’s Baseline Assessments have been carried out.

## **1.8 Evidence and Record keeping requirements**

The annual Self-Assessment must be recorded using the forms supplied by Natural England. In addition you will need to take photographs during the Self-Assessment and supply these on request. See Annex 4 for full details.

## **2.0 Agreements and Eligibility**

### **2.1 Eligibility criteria**

To be eligible for the Pilot Scheme the following criteria must be met by the applicant and the proposed Agreement Land (plots):

- The applicant's holding (SBI) must fall partially or wholly within the pilot area boundary as shown in Section 1.2 and be over 10ha in size. Agreement Land must be within the pilot boundary.
- There must be an existing Environmental Stewardship (ES) or Countryside Stewardship (CS) agreement on the holding with one or both of the equivalent options listed in Section 1.1. N.B. an applicant can only apply for an option if they already have an area of equivalent habitat on their holding within the pilot boundary.
- The Agreement Land itself must not be managed under any other agri-environment scheme option for the duration of the RBAPS Agreement. Land within an ES or CS agreement is eligible for the Pilot Scheme providing it does not have an ES option on it.
- Applicants must have control of all the Agreement Land and all the activities needed to meet the Pilot Scheme requirements for the full duration of the Agreement.
- The Agreement Land must be registered on the Rural Land Register, defined as agricultural and classified as either temporary grass or arable.
- Agreement Land must not be in receipt of any other funding other than the Basic Payment Scheme (BPS).
- Agreement Land must not be used as Ecological Focus Areas (EFAs).
- Agreement Land must not be under any other grant or management obligation such as Inheritance Tax Exemption.
- Agreement Land must not be designated a Site of Special Scientific Interest (SSSI), Special Protection Area (SPA) or Special Area of Conservation (SAC).
- Please note there are additional eligibility criteria that apply to individual options. These are detailed in Section 1.4.2, 1.4.4.
- If you are a public body or if the Agreement Land is owned or run by a public body or if your landlord is a public body please check with Natural England if you are eligible to apply.

## **2.2 Relationship with the Basic Payment Scheme**

Land used to claim the Basic Payment Scheme (BPS) [www.gov.uk/government/collections/basic-payment-scheme](http://www.gov.uk/government/collections/basic-payment-scheme) may also be entered into the Pilot Scheme. However it must not be used as an Ecological Focus Area (EFA) for BPS. Land that is ineligible for BPS may still be eligible for the Pilot Scheme.

## **2.3 Protected species**

Where protected species are present on the Agreement Land, you will need to consider the requirements for protection which apply to those species before undertaking management activities.

## **2.4 Scheduled Monuments**

Scheduled Monuments can be included in the Pilot Scheme. It is your responsibility to ensure there is no conflict between your management of the Agreement Land and the management requirements of the Scheduled Monument.

## 2.5 How to apply

This section provides applicants with the information required to apply for the Pilot Scheme

All applicants need to have a Single Business Identifier (SBI) number to apply.

### 2.5.1 Complete and submit the application

Applicants must read and complete the application form and map to the minimum standard described in Annex 2. Send both to your Natural England adviser by the closing date (31<sup>st</sup> July 2016). You must sign your application and any supporting forms by hand. If you are submitting by email you will need to print out the relevant section(s)/form(s), sign and scan the documents back into your computer.

Please note that the location of the winter bird food does not need to be drawn on the map as it will be captured on the claim form, but we do require a map(s) of the parcels it may be put on in the first year to ensure they fall within the pilot boundary. Winter bird food plots can be moved between the first and second year of the Agreement, **but Natural England must be notified and agree in writing the location of the plot before it is sown. The plot must be within the pilot boundary.**

### 2.5.2 On submission of the application

Natural England will carry out eligibility checks and assess your application using the criteria in Section 2.1.

Natural England is seeking around 20 participants in the Pilot Scheme. If the Scheme is oversubscribed the criteria below will be applied in the following order to select the final participants:

- Priority will be given to those applicants with both areas of habitat already on their holding
- For those applicants meeting the first requirement, priority will be given to those with the longest periods left in their current agri-environment agreement

If you are successful you will be offered an Agreement. If you wish to accept the Agreement you must sign the declaration and return it by 15<sup>th</sup> August 2016.

Declarations should be signed, scanned and emailed to:  
Annabelle.LePage@naturalengland.org.uk  
or sent to: Annabelle LePage, Natural England,  
Foss House, Kings Pool, 1-2 Peasholme Green, York, YO1 7PX

Natural England reserves the right to withdraw the offer if it is not accepted on time.

Unsuccessful applicants will be notified in writing by 15th August 2016.

## 2.6 Agreement Duration

If successful, you will be offered an arable RBAPS Agreement which will last for 2 years and 2 ½ months: 15 August 2016 to 30 September 2018

## **2.7 Agreement claims**

Agreement Holders will need to submit a Payment Claim each year in November 2017 and October 2018. To claim for payment you must first complete a “Self-Assessment” during the Assessment Window to prove the Results Criteria have been delivered on your Agreement Land. You also need to give Natural England or their representatives access to carry out equivalent Expert Assessments during the Assessment Windows to check the results (see Sections 1.5 and 1.6).

You must not materially alter the condition of the Agreement Land and/or the items subject to the Results Criteria before all of the following requirements are met in each year: the Self Assessment has taken place; the Expert Assessment has taken place; and the Agreement Holder has received and confirmed the results of the Expert Assessment.

The location of the winter bird food plots must be recorded on the claim form.

## **3 Agreement Management**

### **3.1 Making a Payment Claim**

Payment Claims should be submitted following the final Expert Assessment in each year and no later than the 15<sup>th</sup> November in 2017 and 30<sup>th</sup> October in 2018.

A claim form will be provided in order to complete this.

### **3.2 Payments**

Payments will be made by BACS following receipt and verification of a valid Payment Claim. Natural England will aim to make payments within 10 days of receiving and verifying a valid Payment Claim.

### **3.3 Disputes, appeals and complaints**

If an applicant or an Agreement Holder, is unhappy with a decision taken by Natural England in respect of an application or an agreement, the applicant or Agreement Holder can appeal.

If there is any dispute over the results of an Expert Assessment you must not materially alter the condition of the Agreement Land and/or the items subject to the Results Criteria until a further re-assessment is done by a third party to verify the results. Agreement Holders must contact Natural England first if planning on carrying out any work whilst disputing our findings. It is strongly recommended that you do not carry out any works to your Agreement Land before the dispute is resolved.

#### **3.3.1 Appeals process – disagreeing with a decision by Natural England**

To appeal against a decision, applicants or Agreement Holders should write to Steve Chaplin, Natural England, Foss House, Kings Pool, 1-2 Peasholme Green, York, YO1 7PX advising of their wish to appeal and providing details of the reasons. Appeals must be received within 60 days of notification of the decision. The permitted reasons are limited:

- that the decision was based on an error of fact;
- that the decision was wrong in law;
- that the delivery body made a procedural error.

A Natural England adviser will ensure the case is properly investigated according to the three-stage appeals process outlined below. If the applicant or Agreement Holder remains unsatisfied following the outcome of each appeal stage, they should write to Natural England requesting the appeal is advanced to the next stage in the process. Not all three stages are necessary for all appeals. Some appeals may meet a satisfactory conclusion after the first stage.

### **First Stage Appeal**

An administrative review of the decision will check whether information is correct, the guidance has been followed and no calculation errors have been made. First stage appeals will be dealt with within 20 working days of receipt.

### **Second Stage Appeal**

A Team Leader from Technical Services or an Area Team will then examine the case and look in detail at the Natural England decision and how Pilot Scheme rules have been applied.

### **Third Stage Appeal**

Natural England will appoint a Senior Manager who has had no previous contact with the case to make an objective review of the Natural England decision and how Pilot Scheme rules have been applied.

### **3.3.2 Complaints about service**

□ If an applicant for the Pilot Scheme, or an Agreement Holder, is unhappy about the way a member of staff has dealt with them, or with the level of service they have received, they should use complaints procedure: [www.gov.uk/government/organisations/naturalengland/about/complaints-procedure](http://www.gov.uk/government/organisations/naturalengland/about/complaints-procedure)

## **3.4 How Natural England will use and share Agreement Holder's information**

The data controller is Natural England, Foss House, Kings Pool, 1-2 Peasholme Green, York, YO1 7PX.

Your information will be stored and processed in accordance with the Data Protection Act 1998. This Act gives you, as an individual, the right to know what data we hold on you, how we use it, with whom we share it and to ensure that it is accurate.

It will be used for administering and analysing applications, agreements and claims under the Pilot Scheme. It will be circulate and discussed in confidence, with any other persons or organisations helping Natural England to assess and monitor applications, agreements and claims. Some information will be shared with other grant distribution bodies and Government Departments, to enable them to detect fraudulent applications, agreements and claims and to co-ordinate the processing of complementary applications, agreements and claims. To do this, we may have to discuss applications, agreements and claims with third parties or disclose information about funding decisions.

Participation in the Pilot Scheme involves expenditure of public money and is therefore a matter of public interest. We may make information about applications, agreements and claims publicly available. Details disclosed may include, but are not limited to, your name, the name and address of your farm or business, grid references, the total area under agreement, the payments you receive, the location of parcels, details of the

agreement and details of inspections. On request, copies of individual applications and agreements will be made available.

Natural England or its appointed agents may use the name, address and other details on your application form to contact you in connection with occasional customer research aimed at improving the services that Natural England provides to you.

We will respect personal privacy, whilst complying with access to information requests to the extent necessary to enable Natural England to comply with its statutory obligations under the Environmental Information Regulations 2004, and the Freedom of Information Act 2000.

# Annex 1 Results Based Agri-environment Pilot Scheme Terms and Conditions

## PARTIES

- (1) Natural England of Foss House, Kings Pool, 1-2 Peasholme Green, York, YO1 7PX (the **Authority**).
- (2) The Agreement Holder as identified in the Agreement Document (the **Agreement Holder**).

## BACKGROUND

- (A) The Authority has agreed to pay the Grant to the Agreement Holder on the terms and conditions set out below and as set out in the Agreement Document and RBAPS Manual.
- (B) The Authority is the delivery body responsible for managing the EU funded project entitled 'Pilot Results-based Payment approaches for agri-environment schemes in arable and upland grassland systems in England'; project No. 07.027722/2015/721692/SUB/B2. This forms part of a wider EU Programme entitled 'EU Pilot on-farm projects to test result-based remuneration schemes for the enhancement of biodiversity Programme'.
- (C) Grants made under RBAPS are paid for achievement of Results Criteria.
- (D) These terms and conditions apply to RBAPS and should be read in conjunction with the details of the Grant set out in the Agreement Document, which are individual to the Agreement Holder. These terms and conditions, the Agreement Document and the Agreement Map together form the agreement between the Authority and the Agreement Holder ("the **Agreement**").
- (E) Additional RBAPS requirements and more detailed information and guidance are set out in the RBAPS Manual. The Agreement Holder must familiarise itself with this document and ensure that it complies with all mandatory elements of the RBAPS Manual as a condition of receiving the Grant.
- (F) In the event of any conflict between these terms and conditions and the documents referred to in paragraphs (D) and (E) above, these terms and conditions shall prevail, followed by the Agreement Document, the Agreement Map, and then the RBAPS Manual.

## 1. DEFINITIONS AND INTERPRETATION

In the Agreement the following terms shall have the following meanings:

**Agreement Document:** the document containing Agreement Holder specific details and which describes, amongst other things, the Grant to be paid to the Agreement Holder if the Results Criteria are achieved

**Agreement End Date:** the date on which the Agreement comes to an end, as set out in the Agreement Document

**Agreement Land:** the land described in the Agreement Document and identified on the Agreement Map(s)

**Agreement Map(s):** the map(s) accompanying the Agreement Document (or otherwise provided to the Agreement Holder by the Authority), identifying the Agreement Land and the agreed locations for Results Criteria to be assessed

**Agreement Start Date:** the date on which the Agreement commences, as set out in the Agreement Document

**Assessment Window:** the periods of time within which the Self Assessment and the Expert Assessment must take place, as set out in the RBAPS Manual

**Baseline Assessment:** baseline assessments of the Baseline Assessment Land to be undertaken by the Authority or its representatives or agents and the Agreement Holder as set out in the RBAPS Manual

**Baseline Assessment Land:** the land on which Baseline Assessments will be undertaken, as described in the RBAPS Manual or agreed between the Authority and the Agreement Holder from time to time

**Expert Assessment:** the assessment to be undertaken by the Authority or its representatives or agents to assess whether the Results Criteria have been achieved on the Agreement Land

**Grant:** the sum(s) to be paid to the Agreement Holder under the Agreement, if, and to the extent that, the Results Criteria are achieved

**Intellectual Property Rights:** all patents, rights to inventions, copyrights and related rights, trademarks, business names and domain names, goodwill and the right to sue for passing off, rights in designs, database rights, rights to use and protect the confidentiality of confidential information (including know-how and trade secrets) and all other intellectual property rights, in each case whether registered or unregistered and including all applications and rights to apply for and be granted, renewals or extensions of, and rights to claim priority from, such rights and all similar or equivalent rights or forms of protection which subsist or will subsist now or in the future in any part of the world

**Payment Claim:** the claim submitted by the Agreement Holder for payment of the Grant

**RBAPS Manual:** the documents which set out additional RBAPS requirements and further information and guidance for Agreement Holders (as further described in clause 5 (the RBAPS Manual)), which are available from the Authority upon request

**Results Based Agri-environment Pilot Scheme or RBAPS:** the EU funded project entitled 'Pilot Results-based Payment approaches for agri-environment schemes in arable and upland grassland systems in England'; project No. 07.027722/2015/721692/SUB/B2. This forms part of a wider EU Programme entitled 'EU Pilot on-farm projects to test result-based remuneration schemes for the enhancement of biodiversity Programme'

**Result Measure(s):** the result measures as set out and described in the Agreement Document and RBAPS Manual

**Retention Period for the Winter Bird Food Option:** the retention period set out in the Agreement Document and as described in the RBAPS Manual

**Self Assessment:** the assessment to be undertaken by the Agreement Holder in accordance with the instructions set out in the RBAPS Manual to assess whether the Results Criteria have been achieved on the Agreement Land

**Working Day:** any day other than a Saturday, a Sunday or a public holiday in England

1.1 References to **clauses** are to the clauses of these terms and conditions. Clause headings shall not affect the interpretation of these terms and conditions.

1.2 A person includes a natural person, corporate or unincorporated body (whether or not having separate legal personality).

1.3 Unless the context otherwise requires, words in the singular shall include the plural and in the plural shall include the singular and a reference to one gender shall include a reference to the other genders.

1.4 A reference to a statute or statutory provision is a reference to it as amended, extended or reenacted from time to time and shall include all subordinate legislation made from time to time under that statute or statutory provision.

1.5 A reference to a public organisation includes a reference to any successor of that public organisation.

1.6 Any words following the terms **including, include, in particular or for example** or any similar phrase shall be construed as illustrative and shall not limit the generality of the related general words.

## **2. AGREEMENT HOLDER'S DECLARATIONS**

2.1 The Agreement Holder confirms that:

(a) the declarations made in its application for the Grant remain true and accurate to the best of its knowledge and belief;

(b) it has full capacity and authority to enter into the Agreement;

(c) it is not aware of any circumstances which would prevent it from fulfilling its obligations under the Agreement or undertaking the management of the Agreement Land pursuant to the Agreement;

(d) if there are any changes to the Agreement Holder's circumstances which could affect its eligibility or suitability for the Grant or its ability to fulfil its obligations under the Agreement or undertake the management of the Agreement Land pursuant to the Agreement, it will notify the Authority in writing without delay;

(e) it has read and understood and will comply with all mandatory elements of the RBAPS Manual;

(f) it has not received and will not receive any duplicate funding or allowances from other public sources in respect of the same obligations it is required to undertake

under the Agreement or in respect of the management of the Agreement Land it undertakes pursuant to the Agreement;

(f) its obligations under the Agreement and the management of the Agreement Land it undertakes pursuant to the Agreement do not duplicate and will not duplicate any other legal obligations it would otherwise be required to undertake;

(g) its obligations under the Agreement and the management of the Agreement Land it undertakes pursuant to the Agreement do not and will not conflict in whole or in part with any other legal or contractual obligations on the Agreement Holder; and

(h) it will at all times comply with all relevant domestic and EU legislation in the performance of its obligations under the Agreement and the management of the Agreement Land it undertakes pursuant to the Agreement.

2.2 The Agreement Holder confirms that it has obtained and will maintain and comply with any permits, licences, permissions, consents, approvals, certificates and authorisations (whether statutory or otherwise) which are required for the performance of its obligations under the Agreement and the management of the Agreement Land it undertakes pursuant to the Agreement. The Agreement Holder understands that the Agreement does not operate as a SSSI consent and that if such consent is required it must apply separately in accordance with any instructions provided by the Authority.

2.3 The Agreement Holder understands that the giving of any approval, consent or acknowledgement, or the review of any document or course of action by or on behalf of the Authority does not relieve the Agreement Holder of any of its obligations under the Agreement unless expressly stated in writing by the Authority.

2.4 The Agreement Holder shall make its own enquiries as to the accuracy and adequacy of any information on which it relies in connection with the Agreement.

### **3. AGREEMENT HOLDER OBLIGATIONS**

3.1 In applying for and receiving the Grant, the Agreement Holder agrees to comply with these terms and conditions, the Agreement Document and the mandatory elements of the RBAPS Manual.

3.2 The Agreement Holder shall seek to achieve the Results Criteria on the Agreement Land (though there is no obligation for the Agreement Holder to do so).

3.3 The Agreement Holder shall carry out and record a Self Assessment for each Result Measure during each Assessment Window in accordance with the instructions set out in the RBAPS Manual.

3.4 The Agreement Holder shall notify the Authority within ten (10) calendar days of the relevant Self Assessment taking place. The Agreement Holder shall retain the records of the Self Assessment and make them available to the Authority or its representatives or agents on request and on inspection (without limitation, such records will be inspected at the Expert Assessment).

3.5 The Authority or its representatives or agents shall undertake an Expert Assessment for each Result Measure during each Assessment Window

3.6 The Agreement Holder shall not materially alter the condition of the Agreement Land and/or the items subject to the Results Criteria before all of the following requirements are met in each year: the Self Assessment has taken place; the Expert Assessment has taken place; and the Agreement Holder has received and confirmed the results of the Expert Assessment.

3.7 Where required by the RBAPS Manual, the Agreement Holder and the Authority (or its agents or representatives) shall carry out and record a Baseline Assessment on the Baseline Assessment Land in accordance with the instructions set out in the RBAPS Manual. Where a Baseline Assessment is required by the RBAPS Manual, the Agreement Holder shall not materially alter the condition of the Baseline Assessment Land and/or the items to be measured on it until both the Agreement Holder's and the Authority's (or its agents or representatives) Baseline Assessments have taken place.

3.8 The Agreement Holder shall not materially alter the condition of any Agreement Land subject to the Winter Bird Food Option during the Retention Period for the Winter Bird Food Option.

#### **4. TERM**

The Agreement shall commence on the Agreement Start Date and, subject to earlier termination in accordance with clause 20 (Termination), it shall continue in force until the Agreement End Date.

#### **5. THE RBAPS MANUAL**

5.1 The Agreement Holder shall comply with the mandatory elements of the RBAPS Manual as a condition of receiving the Grant.

5.2 In some circumstances the Authority may consider it necessary to amend or update the RBAPS Manual. The Authority will notify the Agreement Holder in writing of any amendments applicable to the Agreement Holder and the date on which such amendment shall take effect.

#### **6. TRANSFERS OR ACQUISITIONS OF LAND**

6.1 The Agreement Holder must notify the Authority without delay if there is a change in management control affecting any part of its Agreement Land, including (without limitation) sale or transfer to a new owner, changes to any lease or tenancy, permanent boundary changes or acquisition of any new land.

6.2 The Agreement Holder acknowledges and accepts that any change in management control affecting its Agreement Land may lead to this Agreement being terminated in accordance with clause 20 (Termination).

#### **7. AMENDMENTS**

No amendments to the Agreement shall be permitted unless expressly agreed in writing by the Authority.

#### **8. PAYMENT CLAIMS**

8.1 The Agreement Holder shall submit Payment Claims and supporting documents to the Authority in accordance with the instructions provided in the RBAPS Manual and on the claim form.

8.2 The Grant will be paid directly to the Agreement Holder's nominated business bank account, subject to the necessary funds being available when the payment falls due. The Agreement Holder agrees and accepts that payment of the Grant can only be made to the extent that the funds are available.

8.3 Any failure by the Agreement Holder to submit a Payment Claim in accordance with the instructions and by the specified deadline (including the provision of any supporting documents necessary to enable the claim to be processed) may result in payment of the Grant being delayed, reduced or withheld.

8.4 All Payment Claims will be checked and verified before any sum is paid. If there is any discrepancy between the amount claimed by the Agreement Holder and the amount the Agreement Holder is entitled to claim, the Grant may not be paid.

8.5 The amount of the Grant shall not be increased in the event of any overspend by the Agreement Holder in the delivery of its obligations under the Agreement.

## **9. REPAYMENT**

9.1 If the Agreement Holder breaches the terms of the Agreement (including, for the avoidance of doubt, the retention requirement at clause 3.8 (Agreement Holder obligations)), or if there is a change in circumstances affecting its eligibility to receive the Grant, the Authority reserves the right to withhold or require repayment of the Grant.

9.2 If the Agreement Holder receives any overpayment or any payment to which it is not entitled (including in the event of an administrative error), the undue amount must be repaid. It is the Agreement Holder's responsibility to check all payments it receives and to notify the Authority immediately if it has any reason to believe that an error has occurred.

9.3 If any sum becomes repayable under the Agreement, it shall be treated as a debt owing by the Agreement Holder to the Authority until such time as the outstanding amount is repaid.

9.4 Where any sum is repayable under the Agreement, the Authority reserves the right to withhold future payments due to the Agreement Holder under this Agreement pending repayment by the Agreement Holder of the outstanding amount.

## **10. ACCESS TO DOCUMENTS AND INFORMATION**

The Agreement Holder shall, upon request, supply any documents, information, data, reports or written or verbal explanations which may be required by any UK or EU public authority (or their authorised representatives or auditors) in connection with the Agreement or the RBAPS. Such checks, audits or evaluations may be initiated during term of the Agreement and for a period of up to five years from its termination or expiry.

## **11. SITE VISITS**

The Agreement Holder shall allow any UK or EU public authority (or their authorised representatives or auditors) to access its land and/or premises in connection with the Agreement. Such access may be required with or without notice. The Agreement Holder agrees to assist and cooperate with any person authorised to carry out any site visits (including

controls and spot-checks) and shall provide access to any land, premises, plant, equipment, documents or electronic information which may be required. Checks, audits or evaluations may be initiated during term of the Agreement and for a period of up to five years from its termination or expiry.

## **12. MAINTENANCE OF ACCOUNTS AND RECORDS**

12.1 The Agreement Holder shall keep accurate and up-to-date accounts and records of the receipt of the Grant monies received by it and evidence of its compliance with its obligations under the Agreement and the management of the Agreement Land it undertakes pursuant to the Agreement which shall comply with any applicable standards and requirements set out in the RBAPS Manual and in any separate instructions issued to the Agreement Holder.

12.2 The Agreement Holder shall keep all invoices, receipts, accounts and tax records and any other relevant documents relating to the receipt of the Grant and evidence of its compliance with the Agreement and the management of the Agreement Land it undertakes pursuant to the Agreement for a period of at least seven years from termination or expiry of the Agreement. If there are on-going audits, appeals, litigation or pursuit of claims concerning the Grant, the Agreement Holder shall keep the documents until such audits, appeals, litigation or pursuit of claims are closed. The Authority shall have the right to review the Agreement Holder's accounts and records relating to the Grant and to take copies of such accounts and records.

12.3 The Agreement Holder shall comply with and facilitate the Authority's compliance with all statutory requirements regarding accounts, audit or examination of accounts, annual reports and annual returns applicable to itself and the Authority.

12.4 In addition to its obligations to provide information to the Authority, the Agreement Holder shall provide any of the information referred to in this clause to any other UK or EU public authority (or their authorised representatives or auditors) upon request.

## **13. EVALUATION**

13.1 The Agreement Holder understands that as a condition of receiving the Grant funding it may be required to participate in a scheme evaluation, which may take place during the Agreement or after its expiry or termination.

13.2 The Agreement Holder consents to its contact details being disclosed to third parties for evaluation purposes and agrees to assist and cooperate with any person authorised by any UK or EU public authority to carry out such an evaluation.

## **14. ACKNOWLEDGEMENT AND PUBLICITY**

14.1 Any communication or publication related to the Agreement, including at conferences, seminars or in any information or promotional materials (such as brochures, leaflets, posters, presentations, etc.), shall indicate that the Agreement has received funding from the European Union and shall display the European Union emblem.

14.2 When displayed in association with another logo, the European Union emblem must have appropriate prominence.

14.3 Any communication or publication related to the Agreement in any form and using any means, shall indicate that it reflects only the author's view and that the European Commission/European Union is not responsible for any use that may be made of the information it contains.

14.4 In using the Authority's or the European Union's name and logo, the Agreement Holder shall comply with all reasonable branding guidelines issued by the Authority from time to time.

14.5 The Agreement Holder agrees to participate in and co-operate with promotional activities relating to RBAPS if required to do so by the Authority.

14.6 The Authority may acknowledge the Agreement Holder's involvement in RBAPS as appropriate without prior notice.

14.7 The Agreement Holder shall comply with all reasonable requests from the Authority to facilitate visits, provide reports, statistics, photographs and case studies that will assist the Authority in its promotional and publicity activities relating to RBAPS.

14.8 Without prejudice to the other provisions of this clause 14 (Acknowledgement and Publicity), the Agreement Holder shall comply with all instructions and guidance from the Authority in relation to acknowledgement and publicity of the Grant, including using any materials or templates which are provided to it for this purpose

## **15. INTELLECTUAL PROPERTY RIGHTS**

15.1 The Authority and the Agreement Holder agree that all rights, title and interest in or to any information, data, reports, documents, procedures, forecasts, technology, know-how and any other Intellectual Property Rights whatsoever owned by or licensed to either the Authority or the Agreement Holder before the Agreement Start Date shall remain the property of that party. If there are any such Intellectual Property Rights which the Agreement Holder wishes to draw to the Authority's attention, the Agreement Holder must do so in writing prior to the Agreement Start Date.

15.2 The Authority and the Agreement Holder agree that all rights, title and interest in or to any information, data, reports, documents, procedures, forecasts, technology, know-how and any other Intellectual Property Rights whatsoever created by either party during the term of the Agreement shall remain the property of that party.

15.3 Where the Authority has allowed the Agreement Holder to use any of its or the European Union's Intellectual Property Rights in connection with the Agreement (including without limitation its name and logo), the Agreement Holder shall, on termination of the Agreement, cease to use such Intellectual Property Rights immediately (subject to any ongoing requirement to use Intellectual Property Rights in compliance with the publicity requirements in clause 14 (Acknowledgement and Publicity)).

15.3 The Authority and the European Union shall have a perpetual, non-exclusive, royalty-free, sublicensable licence to use any Intellectual Property Rights created by the Agreement Holder in connection with the Agreement.

## **16. DATA AND INFORMATION**

16.1 The parties shall comply with all relevant UK and EU data protection legislation in delivering their obligations under the Agreement.

16.2 Information and data about the Agreement (including details about the Agreement Holder and the Grant) may be published on public websites.

16.3 The Agreement Holder consents to its contact details being disclosed to any UK or EU public authority (or their authorised representatives or auditors) for monitoring, inspection or evaluation purposes.

16.4 The Agreement Holder acknowledges that the Authority is subject to the requirements of the Freedom of Information Act 2000 (FOIA) and the Environmental Information Regulations 2004 (EIRs).

16.5 The Agreement Holder shall provide all necessary assistance and cooperation which is reasonably requested by the Authority for the purposes of complying with its obligations under the FOIA and EIRs. If the Authority requires the Agreement Holder to supply information pursuant to a FOIA / EIR request, the Agreement Holder shall supply all such information which is within its possession or control within 5 Working Days (or such other period as the Authority shall reasonably require).

16.6 If the Agreement Holder receives a FOIA / EIR request from a member of the public, it shall not respond to the request but shall forward the request to the Authority within 2 Working Days of receipt.

16.7 The Authority shall determine in its absolute discretion whether any information is exempt from disclosure in accordance with the provisions of FOIA and / or the EIRs.

16.8 Further details about how information about the Agreement Holder and the Agreement will be used and shared are set out in the RBAPS Manual.

## **17. CONFIDENTIALITY**

17.1 Without prejudice to the provisions of clause 16 (Data and Information), the Agreement Holder shall preserve the confidentiality of any information and documents, in any form, which are disclosed in writing or orally in relation to the implementation of the Agreement and which are explicitly indicated in writing as confidential.

17.2 The Agreement Holder shall not use confidential information and documents for any reason other than fulfilling their obligations under the Agreement, unless otherwise agreed with the Authority in writing.

17.3 The Agreement Holder shall be bound by the obligations referred to in Clauses 17.1 (Confidentiality) and 17.2 (Confidentiality) during the implementation of the Agreement and for a period of five years from its termination or expiry, unless:

- (a) the Authority agrees to release the other party from the confidentiality obligations earlier;
- (b) the confidential information becomes public through other means than in breach of the confidentiality obligation through disclosure by the party bound by that obligation;
- (c) the disclosure of the confidential information is required by law.

## **18. LIMITATION OF LIABILITY**

18.1 Neither party excludes or limits its liability for death or personal injury caused by its negligence, fraud or fraudulent misrepresentation, or any other liability which cannot be limited or excluded by law.

18.2 The Authority and the European Commission/European Union accept no liability for any consequences, whether direct or indirect, arising from the Agreement, the use of the Grant by the Agreement Holder or the Authority exercising its rights under the Agreement.

18.3 Subject to clause 18.1 (Limitation of Liability) and 18.2 (Limitation of Liability), the Authority's total aggregate liability in connection with the Agreement shall not exceed the amount of the Grant.

18.4 The Agreement Holder shall indemnify the Authority and the European Commission/European Union and any persons acting on their behalf against all claims, demands, actions, costs, expenses, losses, damages and all other liabilities arising as a result of the actions or omissions of the Agreement Holder in connection with the Agreement.

## **19. CONFLICT OF INTERESTS**

19.1 The Agreement Holder shall take all necessary measures to prevent any situation where the impartial and objective implementation of the Agreement is compromised for reasons involving economic interest, political or national affinity, family or emotional ties or any other shared interest ("conflict of interests").

19.2 The Agreement Holder shall promptly notify the Authority of any situation constituting or likely to lead to a conflict of interests during the implementation of the Agreement. The Authority shall confirm the steps the Agreement Holder must undertake to rectify the situation.

## **20. TERMINATION**

20.1 The Authority reserves the right to terminate the Agreement on written notice to the Agreement Holder if:

- (a) the Agreement Holder has breached the terms of the Agreement or there is a change in circumstances affecting its eligibility to receive the Grant (whether or not any steps have been taken to recover the Grant in accordance with clause 9 (Repayment));
- (b) if there is a change in management control affecting any part of the Agreement Land, including (without limitation) sale or transfer to a new owner, changes to any lease or tenancy, permanent boundary changes or acquisition of any new land; or
- (c) the Agreement Holder has failed to repay any sum which has become recoverable in accordance with clause 9 (Repayment).

20.2 In addition to its right to terminate under clause 20.1 (Termination) above, the Authority may terminate the Agreement and any future Grant payments on giving the Agreement Holder three months' written notice at any time. Provided that the Agreement Holder is not in breach of the Agreement, Grant payments already paid will not be recoverable.

20.3 The Agreement Holder may terminate the Agreement at any time by giving written notice to the Authority.

## **21. CONSEQUENCES OF EXPIRY OR TERMINATION**

21.1 Expiry or termination of the Agreement shall not affect any rights, remedies, obligations or liabilities of the parties that have accrued up to the date of expiry or termination which existed at or before the date of expiry or termination.

21.2 Expiry or termination of the Agreement shall not affect the continuing rights and obligations of the parties under clauses 9 (Repayment), 10 (Access to Documents and Information), 11 (Site Visits), 12 (Maintenance of Accounts and Records), 13 (Evaluation), 14 (Acknowledgement and Publicity), 15 (Intellectual Property Rights), 16 (Data and Information), 18 (Limitation of Liability), 21 (Consequences of Expiry or Termination), 23 (Severability), 24 (Waiver), 25 (Notices), 26 (Dispute Resolution), 28 (Joint and Several Liability), 29 (Third Party Rights), 30 (Governing Law) or any other provision in the Agreement or mandatory requirement in the RBAPS Manual which is expressly stated to survive expiry or termination of the Agreement or which is required to give effect to such termination or expiry or the consequences of such termination or expiry.

## **22. VARIATION**

22.1 The Authority reserves the right to vary these terms and conditions or the Agreement Document. Any variation will be effected in writing and notified to the Agreement Holder in advance. The Authority shall endeavour to give such notice as is reasonable and proportionate, having regard to the nature of the variation and its consequences for the Agreement Holder.

22.2 The Authority also reserves the right to amend or update the RBAPS Manual. Further details are given about this at clause 5.2 (The RBAPS Manual) above.

## **23. SEVERABILITY**

If any term, condition or provision of the Agreement is held to be invalid, unlawful or unenforceable to any extent, such term, condition or provision will not affect the validity, legality and enforceability of the other provisions of or any other documents referred to in the Agreement.

## **24. WAIVER**

No failure or delay by either party to exercise any right or remedy under the Agreement shall be construed as a waiver of that right or remedy unless expressly confirmed by such party in writing.

## **25. NOTICES**

25.1 All notices in relation to the Agreement shall be in writing and shall be deemed to have been duly given if personally delivered, e-mailed, or mailed (first class postage prepaid) using the contact details set out in the Agreement Document (or any updated address which is subsequently notified by one party to the other). It is the Agreement Holder's responsibility to notify the Authority of any change to its contact details.

25.2 If personally delivered or if e-mailed all such notices shall be deemed to have been given when received (except that if received on a non-Working Day or after 5.00 pm on any Working Day they shall be deemed received on the next Working Day) and if mailed all such notices shall be deemed to have been given and received on the second Working Day following such mailing.

## **26. DISPUTE RESOLUTION**

Any dispute arising between the parties or any complaint or appeal by the Agreement Holder concerning the Authority's actions in connection with the Agreement shall be resolved according to the procedure set out in the RBAPS Manual.

## **27. NO PARTNERSHIP OR AGENCY**

The Agreement shall not create any partnership or joint venture between the Authority and the Agreement Holder, nor any relationship of principal and agent, nor authorise any party to make or enter into any commitments for or on behalf of the other party.

## **28. JOINT AND SEVERAL LIABILITY**

Where the Agreement Holder is not a company nor an incorporated entity with a distinct legal personality of its own, the individuals who enter into the Agreement on behalf of the Agreement Holder shall be jointly and severally liable for the Agreement Holder's obligations and liabilities arising under the Agreement.

## **29. THIRD PARTY RIGHTS**

The Agreement does not and is not intended to confer any contractual benefit on any person who is not a party to the Agreement.

## **30. GOVERNING LAW**

The Agreement shall be governed by and construed in accordance with the law of England and the parties irrevocably submit to the exclusive jurisdiction of the English courts.

## Annex 2 How to complete the application map

A map is required with your application to show where the options you are applying for are located on your farm. The map you supply will also become your Agreement Map and it needs to be clear, legible and meet certain standards.

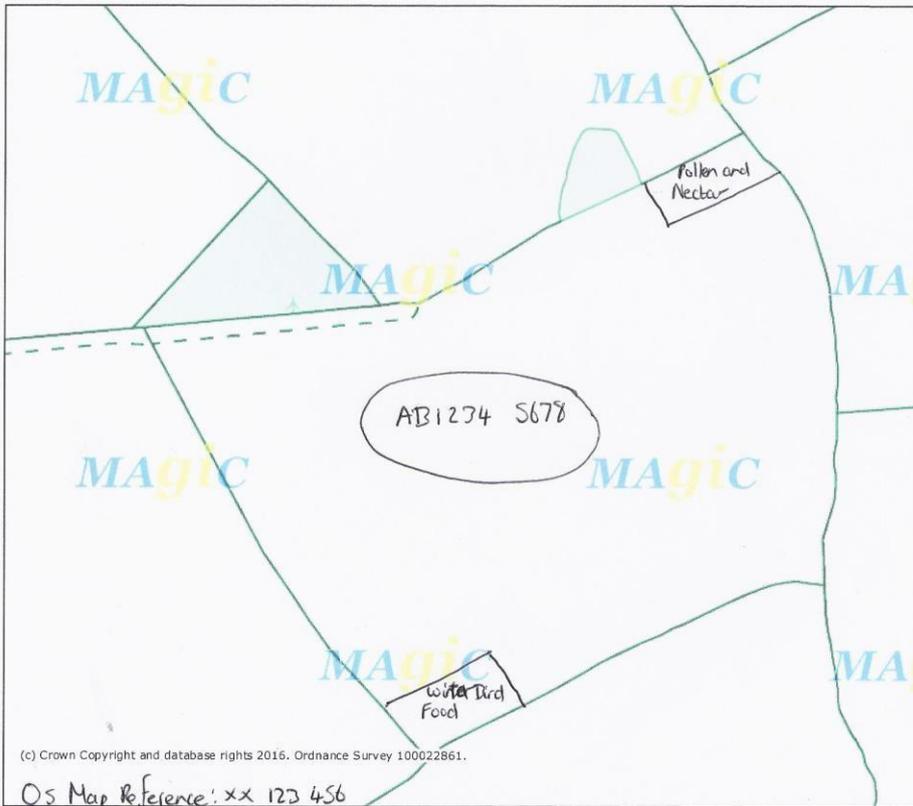
The map can be sourced from a variety of places; for example Rural Payments Land Viewer or [www.magic.gov.uk](http://www.magic.gov.uk) or an existing Environmental Stewardship or Countryside Stewardship agreement map. If using magic.gov.uk, please use the 'export map tool' as this adds the required licence information. Whatever source is used please ensure that it has the **copyright licence for this use**.

The map must meet the following requirements:

1. A3 or A4 in size.
2. 1:2500 or 1:10 000 scale, however if using an existing Environmental Stewardship or Countryside Stewardship map or the Rural Payments Land Viewer the map will be automatically scaled which is acceptable.
3. It must show the whole field on which the options are to be located.

The map must include the following:

1. Scale of the map.
2. Single Business Identifier (SBI) – consisting of 9 digits, agreement title (as detailed on the application form), to be written on the top right.
3. Name of business or applicant – this should be the name (beneficiary) that is registered with the Rural Payments Agency (RPA) for the SBI, to be written on the right hand side.
4. If there are no numbered OS grid lines an 8 figure OS grid reference for the centre of the map, to be written on the bottom left.
5. Field reference number e.g. SK 1234 5678, for the field parcels where the option will be placed
6. Circle the field reference number for all fields that are to be included in the application.
7. Mark on the map where the plots are to be located (pollen and nectar only)



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OS Map Reference: XX 123 456

Scale 1: 2500  
Map Number 1 of 1

Projection = OSGB36  
xmin = 344100  
ymin = 249500  
xmax = 344900  
ymax = 249900  
Map produced by MAGIC on 19 January, 2016.  
Copyright resides with the data suppliers and the map must not be reproduced without their permission. Some information in MAGIC is a snapshot of the information that is being maintained or continually updated by the originating organisation. Please refer to the metadata for details as information may be illustrative or representative rather than definitive at this stage.

## **Annex 3 Guidance on establishing and managing your options (not mandatory)**

### **PBR Management Guidance for Winter Bird Food Plots (v2 April 2017)**

This guidance provides the main information you will need to meet the results measures and to get the most out of your winter bird food option. Please read carefully and if necessary seek professional help when establishing and managing the winter bird food (WBF) plots.

#### **What to Sow**

In order to maximise your chance of achieving the results measures and receiving the higher payment rates, it is recommended you sow at least 5 of the following crops.

- Triticale, wheat, naked oats or barley - counts as one crop
- Red millet
- White millet
- Quinoa
- Fodder radish
- Dwarf sunflowers
- Linseed
- Mustard
- Gold of pleasure
- Spring oilseed rape
- Buckwheat\*

\*Buckwheat is included as an eligible crop but its inclusion should only be considered where there has been a crop failure and you need to re-establish something from mid-late June onwards.

Biennial or perennial crops such as kale or chicory are not recommended for this project as the plots have to be sown annually.

Annual crops which provide a structural element such as dwarf sorghum and/or reed millet can be included but please note they do not count when recording the number of species present. Please see the assessment methodology for further details.

Sowing less than 5 crops or sowing crops not listed above or sowing high rates of dwarf sorghum and reed millet is not recommended as this will potentially reduce the crop diversity and jeopardise your chance of achieving a high score and receiving the higher payment rates. Liaise with your agronomist or seed merchant over the best mix for your situation.

## **Where to Sow**

Winter bird food plots are best located on fertile sites with a sunny aspect. Sowing the option in shady and/or north facing sites can lead to poor establishment and low levels of seed production. In addition always choose sites where you can produce a firm, fine and clean seedbed in the spring.

To minimise predation and reduce the distance that birds have to travel to feed, winter bird food option areas should be located within close proximity to existing cover, foraging and/or nesting habitats e.g. mature hedges, flower rich margins/plots, cultivated fallows, scrub and ponds. The exceptions to this rule are birds such as corn bunting, skylarks and grey partridge which prefer a more open location.

Do not put any blocks or strips next to public highways or PRow where there is likely to be regular disturbance.

## **When to Sow**

Winter bird food plots are sown in the spring, typically between mid-March and early June. Ideally, cereals should be sown at the earlier timing. Sowing cereals in late May or early June is too late and in some seasons they may not flower and set seed. All the other crops listed will generally establish more rapidly and successfully when sown during May or very early June. Sowing at this later timing may coincide with dry conditions, particularly on light land but sowing when soil and air temperatures are warm usually offers the best chance of good establishment.

## **How to Sow**

Seed size can vary considerably which makes sowing at the optimum depth difficult to achieve. For instance, small seeded crop like quinoa should be sown at approx. 1 cm depth, cereals at 2.5 cm and dwarf sunflowers up to 5 cm. See the winter bird food presentation from Peter Thompson for more detailed information on sowing depths.

Where a WBF mix containing a range of crops is sown in one operation, a compromise will have to be reached over drilling depth. As a general guide, sow at a shallower seed depth to ensure the small seeded species are not sown too deep. Another approach is to sow the cereal component first on wide rows in March/April and then drill the smaller seeded crops later in May/early June. This allows both the cereals and smaller seeded species to be sown at the optimum time and at the correct seed depth. The risk with this approach is an early sown cereal crop may be too competitive when the small seeded crops such as quinoa, millet etc. start to emerge. You will probably need to adjust the drilling date, row width and seed rates to avoid this scenario. Speak to your seed merchant or agronomist who may have experience of this approach.

What is the correct drilling width when sowing WBF mixes? This is a difficult question to answer. The conventional approach is to sow as per a cereal crop on relatively narrow rows but much wider rows (up to 50 cm) have been shown to give stronger plants which are less likely to lodge. In addition wider rows allow space in the bottom of the crop for birds to land and move around in. However, the optimum row width for this project will depend on soil conditions, seed choice, sowing rate and time of sowing and will vary from site to site. Please discuss all these aspects with your agronomist or seed merchant before establishing your WBF plots.

In most situations, roll afterwards to ensure a level seedbed with good seed soil contact. Rolling before sowing may also be required on heavier soils.

It's important to remember that winter bird food mixtures contain seed of varying sizes which can settle out during transit and drilling, with larger seeds settling on the top and smaller seeds at the bottom of the hopper. Always mix the seed in the hopper immediately prior to drilling to prevent uneven plant distribution at emergence.

## **Crop Nutrition**

Soil testing the plot areas is advisable. The soil indices in the plot areas may be quite different from the adjacent land and all of the eligible species will benefit from adequate crop nutrition. Adequate N, P, K fertiliser is important, particularly where plots are grown on light soils or on the same area of land for several years.

Seed production is the main objective, so it is important to apply organic manure or inorganic fertiliser. Brassicas respond well to nitrogen fertiliser. In trials, seed yield from brassicas increased 19 fold when nitrogen rates were raised from 30 kg/ha to 90 kg/ha but the risk is too much nitrogen may lead to lodging of the other crops.

Typical annual application rates of nitrogen are in the region of 50-60 kg/ha N, plus similar amounts of P & K if necessary but any fertiliser recommendations should be provided by a FACTS qualified advisor who can take into account soil type, soil N supply, soil indices, previous cropping and crop requirements etc. In addition, consider using manganese and other nutritional products which you routinely use on your other agricultural crops.

## **Weed Control**

Avoid locations where high levels of weeds are known to be present, (e.g. couch, creeping thistles, docks, redshank) or where rogue millets such as barnyard grass or yellow foxtail have built up in the soil and become a problem. If necessary and where the soil type allows, consider leaving the areas to 'green up' and then spray (or possibly cultivate) the re-growth with a recommended non-selective herbicide prior to establishment but the best way to avoid perennial weeds as well as the rogue millets is to move the plots to fresh, clean ground.

In certain circumstances, selective herbicides can be used to control weeds within the sown winter bird food plots but please check with a BASIS-qualified agronomist that it is legal and safe to do so.

## **Pest Control**

Flea beetle damage can be an issue on brassicas and linseed, particularly at early crop emergence stage. Establishment in good growing conditions when soil and air temperatures are warmer can sometimes help plants grow away from flea beetle damage.

Where damage is bad and affecting establishment an insecticide treatment may be warranted. Any recommendation should be made by a BASIS qualified agronomist and applied in accordance with the label requirements.

Slugs are often a significant problem especially where bird food plots are repeatedly sown in the same place. Trash can build up leading to an increase in the slug population, particularly on heavier soils. The most effective slug control measure is to ensure a firm seedbed and where possible ring roll after drilling.

Unfortunately, WBF plots can also be very attractive to a range of other pests such as hares, rabbits, pigeons and deer. Monitor crops regularly in the early stages and use appropriate preventive measures to prevent constant grazing.

### **Crop Failure**

It is important to monitor crops in the first 4-6 weeks after sowing to check if there is a uniform establishment. Where establishment is poor it may be necessary to re-sow part or the entire plot. Each situation will be different depending on the remaining plant population and when any re-sowing has to take place.

Broadcasting seed into a standing crop may be appropriate or in the worst case scenario you may need to start again. However, please note that any previous herbicide use on the plots may impact on how you re-establish a failed crop and what crops can be used. Many herbicides have some residual activity and low levels may still be present in the soil. If you are unsure, please discuss with your seed supplier or advisor as to the best course of action. As a general rule, gold of pleasure (camelina) can be sown up until mid-July whilst fodder radish, mustard, gold of pleasure and buckwheat can be sown up to the end July and still set seed for the winter.

Remember, growing a successful WBF plot takes as much care and attention as any other commercial crop on the farm.

## **PBR Management Guidance for Pollen and Nectar Plots (v2 July 2017)**

The following guidance note provides key information on how best to establish and manage Pollen & Nectar (PN) mixtures.

### **What to Sow**

A Pollen & Nectar (PN) seed mix containing both legume and non-legume species will typically deliver an extended flowering period for pollinators and a more persistent sward containing a higher number of flowering species.

Short-lived species such as common vetch, yellow trefoil and phacelia can also be considered to provide some additional interest in the first summer after sowing. However, their inclusion must not be to the detriment of the other sown flower species.

Legume species to consider:

- Bird's-foot trefoil
- Sainfoin
- Red clover
- Alsike clover
- Lucerne
- Common vetch
- Black medick

Non-legume species to consider:

- Black knapweed
- Musk mallow
- Oxeye daisy
- Yarrow
- Wild carrot

NB It is recommended that grasses are not included in the seed mixture as they can suppress sown flower species.

Further information is available on the range of flower species that can be sown in the *RBAP Arable Pilot Pollen & Nectar (PN) Plant ID Guide*.

## How Many Species To Sow

As a general rule, sowing a minimum of 5 legume plus a minimum of 2 (ideally 4) non-legume flower species should result in a sward containing an average of 5 or more sown flower species throughout the agreement (including years 4-5 when many clover species will start to decline in vigour extent), allowing for some losses during establishment.

## Seed Rate

The following is recommended:

- For light/medium soils with a low weed burden a seed rate of 8-10 kg/ha will be appropriate.
- For heavier soils with higher weed and pest pressure, a higher seed rate of up to 15 kg/ha can be considered.

To ensure a good balance of vigorous (less persistent) agricultural legume species that can suppress the slower growing but more persistent wildflower species, such as black knapweed and musk mallow, the following maximum inclusion rates (% of total seed weight) are recommended:

- Alsike clover – 10%
- Crimson clover – 15%
- Red clover – 10%
- Sweet clover – 5%
- White clover – 5%
- Black medick – 5%
- Lucerne – 10%

Example mix:

Species	% inclusion rate	Seed rate (kg/ha)
Sainfoin	40%	6.00
Bird's-foot trefoil	20%	3.00
Red clover early flowering (50% early 50% late)	10%	1.50
Alsike clover	10%	1.50
Lucerne	10%	1.50
Black medick	5%	0.75
Black knapweed	1%	0.15
Musk mallow	1%	0.15
Oxeye daisy	1%	0.15
Wild carrot	1%	0.15
Yarrow	1%	0.15
<b>Total</b>	<b>100%</b>	<b>15.00 kg</b>

### Where to Sow

This option is best located on less fertile sites with a sunny south-facing aspect.

It is recommended that the following are avoided:

- cold, damp and/or shady locations;
- highly fertile sites (peaty soils, N rich) which will favour aggressive grasses and broad-leaved weeds to the detriment of sown flower species;
- sites with a history of hard-to-control weeds such as creeping thistle, spear thistle, broad-leaved dock, curled dock, common ragwort and nettle.

### Prior to Sowing

It is recommended that perennial weeds such as creeping thistle, couch grass and docks are controlled prior to sowing.

Aim to produce a well consolidated firm, fine and level seed bed to ensure even germination and establishment.

Be careful not to create "fluffy" overworked seed-beds on lighter soils which can lead to seed being sown too deep and/or poor emergence due to 'capping' where rain falls soon after sowing.

Cloddy uneven seed-beds on heavier land will also result in uneven establishment as some seed is sown deeper than others. Where seed-beds are still very uneven after secondary cultivations, consider using a ring roll prior to sowing, to help further consolidate and level the seedbed.

## **When to Sow**

Typically the best results generally come from April-May or July-August sowings. Many of the flower species included in Pollen & Nectar (PN) mixtures are slow to develop so require plenty of growing time (minimum of 12 weeks) between sowing and the onset of any serious frosts. A minimum soil temperature of 7°C at sowing time is also vital.

For the purposes of this pilot, however, all Pollen & Nectar (PN) plots should ideally be sown by 31 August 2016.

## **How to Sow**

Like all small seeds, a Pollen & Nectar (PN) mixture will germinate best when broadcast or very shallow drilled onto the surface of a seedbed that is level, warm and containing some available moisture. One of the most common causes of failure during the establishment period is sowing small seeds too deep using a conventional drill.

To ensure an even distribution of the various seed mix constituents across each plot consider sowing 50% of the seed in one direction across the plot and then sowing the remainder of the seed at a 90 degree angle to the first pass.

It can also prove difficult to sow using very low levels of seed in conventional equipment. Therefore adding an inert carrier and mixing well can help with seed flow and achieve a more even seed distribution. Example carriers include barley meal and poultry chick crumb.

Periodically mixing the seed in the hopper is important to help prevent it from settling out into its constituent parts which can lead to uneven establishment. If you are travelling a fair distance between plots, make sure you mix the seed well immediately prior to sowing the plot.

If the soil is dry enough it is recommended that you ring roll immediately after broadcasting to improve seed to soil contact, help retain moisture, and reduce the risk of slug damage.

It is also recommended that you monitor newly sown Pollen & Nectar (PN) plots after sowing for any signs of slug damage and treat as necessary (see Pest Control section below).

## **MANAGEMENT DURING THE FIRST 12 MONTHS AFTER SOWING**

### **Background**

Cutting is the ideal management tool for controlling annual weeds (including crop volunteers such as oilseed rape, wheat and barley), suppressing more vigorous seed mix components (such as common vetch, red clover or yellow trefoil) and encouraging sown species to develop.

### **When is cutting to be completed**

You should only need to cut for the following reasons:

- To control weeds and crop volunteers threatening the establishment of the sown flower species;
- To suppress vigorous seed mix components such as common vetch, red clover or yellow trefoil\*.

\*This is not commonly an issue so most cutting completed in the first spring/summer after sowing will be to control weeds/crop volunteers.

### How often to cut

Seed mixtures containing only perennial legumes (such as bird's-foot trefoil, sainfoin, red clover and alsike clover) and wildflowers (such as yarrow, black knapweed, wild carrot, oxeye daisy and musk mallow) can be cut 2-3 times without harming the sown flower species.

Mixes also containing annuals (such as crimson clover, phacelia and common vetch), however, should not be cut too close to flowering as the annual flower species may not flower after cutting.

### When to start cutting

As a general guide, the first cut should be completed when weeds are growing vigorously above the seedlings, cutting out sunlight and starting to smother them (see Figure 1 below).



Figure 1: when to cut a newly established flower mix. Marek Nowakowski, Feb 2017.

Please note:

- Where cutting is absolutely essential, and annual flower species have been included in a mixture, it is recommended that cutting is carried out either 'early season' when the annual flower species (such as phacelia, crimson vetch and common vetch) are still small (<30 cm height) and have not yet reached the flower bud growth stage, or 'late season' after the annuals have completed flowering. **If in doubt it is recommended that these flower species are not cut until they have completed flowering and the plot assessment has been completed.**
- To ensure the first cut is correctly timed it is recommended that newly sown Pollen & Nectar (PN) plots are regularly monitored in the first spring/summer after sowing.

- To allow sown flower species sufficient time to re-grow and flower after topping, it is recommended that the last cutting operation is completed a minimum of 4 (preferably 6-8) weeks before the planned plot assessment.

## **CUTTING FROM YEAR 2 ONWARDS**

### **Background**

Once Pollen & Nectar (PN) plots have become fully established, they can be managed with cutting to help control weeds, clear away dead material from the previous season's growth and encourage vigorous re-growth of the flowering species.

As a general guide it is recommended that plots are left uncut between 15 May and 31 July to ensure maximum flowering of the sown species during the plot assessment period.

Recommended cutting regime:

- **Main cut** – cut 100% of the plot to 10 cm between 1 August and 30 October 2018; once the majority of flowering plants have completed flowering.
- **Optional spring 2018 cut** – to help clear away dead material from the previous season's (autumn) growth cut up to 100% of the plot to 10 cm between 1 April and 30 April.

### **What to do with cut material**

Where the volume of cut material is likely to be high (during either the optional 'spring' or 'main' cuts) the removal of dense cuttings is recommended to encourage strong re-growth of the flower species as well as to minimise nutrient enrichment and weed ingress.

Where the volume of cut material is likely to be low, however, leaving it to rot down in situ is acceptable.

### **Cutting and wildlife**

Under the Wildlife and Countryside Act 1981 all birds, their nests and eggs are protected by law and it is an offence, with certain exceptions, to: intentionally kill, injure or take any wild bird, intentionally take, damage or destroy the nest of any wild bird whilst it is in use or being built.

Checking plots for bird nests prior to cutting is therefore recommended.

Where nests are present delay cutting until birds have fledged.

To minimise damage to other wildlife (such as young leverets, amphibians and hedgehogs) a minimum cutting height of 20 cm is recommended.

## WEED CONTROL

### Annual weeds and crop volunteers

Annual weeds and crop volunteers can be easily controlled by cutting regularly in the first 12-18 months after sowing.

### Harder to kill biennial and perennial weeds

However, whilst cutting will achieve some control of perennial weeds (such as creeping thistle and docks) by killing seedlings and suppressing established plants, the following control methods may also need to be utilised over time:

- localised repeated cutting
- spot application of a herbicide
- hand removal

### Grass weeds

In some plots, grasses can become too competitive often leading to the suppression of the nectar component leading to both a delayed and reduced provision of pollen and nectar. In this situation, the use of a selective graminicide can be considered instead of early cutting.

The graminicide will typically control a number of grass species (**not all**) without damaging the nectar component. However, effective control of grasses can result in significant areas of bare ground forming post spraying which can in turn become ideal germination sites for other weeds such as thistles.

## PEST CONTROL

Slugs can be a significant problem during early establishment of Pollen & Nectar (PN) plots particularly on heavy land where brassica crops such as oilseed rape are sown more frequently in the rotation.

The most effective slug control measure is to ensure a firm seedbed that is consolidated soon after sowing using a ring roll. In addition, to help bury trash consider ploughing prior to sowing the seed mix rather than using min till.

It is recommended that slug pellets should **only** be used as a last resort after test baiting using mash to confirm population thresholds.

Where possible consider using ferric phosphate-based pellets which exhibit low toxicity to non-target wildlife species such as farmland birds. Brands include 'Sluggo' (from Omex), 'SluXX' (from Certis), 'Ironmax Pro' (from De Sangosse) and 'Ferramol Max' (from Omex).

If you are considering using metaldehyde-based pellets always refer to the Metaldehyde best practice advice given by the Metaldehyde Stewardship Group:

## **CROP NUTRITION**

Where possible try and maintain a neutral pH that will suit the majority of sown flower species. Lime can be added to the seed-bed as necessary where soil tests indicate a deficiency.

## **RE-SEEDING FAILED OR GAPPY PLOTS**

It is important to monitor autumn sown Pollen & Nectar (PN) plots in the spring (March – end April) to determine how well the seed mixtures have established. It is recommended that spring sown Pollen & Nectar (PN) plots are inspected 6-12 weeks after sowing to check if there is good establishment.

Where establishment is poor it may be necessary to re-sow part of or the entire plot. Each situation will be different depending on the remaining plant population and when any re-sowing has to take place.

Broadcasting seed or very shallow drilling seed into the existing sward (perhaps after a light cultivation to create some bare ground) may be appropriate or in the worst case scenario you may need to start again. Rolling after sowing will ensure good seed:soil contact, retain moisture and reduce slug damage.

If you are unsure as to the best course of action please discuss with your seed supplier or adviser.

**Remember, growing establishing a successful Pollen & Nectar (PN) plot takes as much care and attention as any other commercial crop on the farm.**

## Annex 4 Assessment methodology

### Winter Bird Food (WBF) Assessment Methodology

- Assessments of the winter bird food plots (WBF) plots need to be carried out between 1<sup>st</sup> September and 15<sup>th</sup> October in 2017 & between 1 September and 30<sup>th</sup> September in 2018.
- Take 10 representative assessments for each plot. The assessments must be taken at regular intervals across the plot ensuring the whole plot area is assessed. It is recommended that you do not take any assessments within 1 metre of the plot boundary. The recordings from all 10 assessments must give an accurate representation of the WBF plot. Do not assess just the best areas. Mark on a map the approximate area where the assessment was carried out.
- At each assessment point count the number of seed heads/seed producing plants using a 1 metre square quadrat. Only count the crops specified in the table. Do not count naturally occurring plants (e.g. thistles, fat hen, and redshank) or any structural crops like dwarf sorghum or reed millet in assessments.
- Any seed head in the quadrat should be counted.
- To count as 'present' within the quadrat, the seed producing plants need to be clearly visible and either equal or exceed the thresholds given for each crop in the table below. Where the crop equals or exceeds the relevant threshold, mark the appropriate box on the scoring sheet. Triticale, wheat, oats or barley count as one crop. Do not record as separate crops.

Crop	Threshold per Quadrat
Triticale, wheat, oats or barley	25 seed heads
Red millet	4 seed heads
White millet	4 seed heads
Quinoa	2 seed producing plants
Fodder radish	1 seed producing plant
Dwarf sunflowers	1 seed producing plant
Linseed	5 seed producing plants
Mustard	2 seed producing plant
Gold of pleasure	5 seed producing plants
Spring oilseed rape	1 seed producing plant
Buckwheat	4 seed producing plants

- There is no need to take a photo of each quadrat.
- On the record sheet, where a crop is recorded in at least 5 of the 10 assessments, record it as being present in the plot as a whole by filling in the final column on the table.
- Add up the number of times a crop is recorded in the final column to work out where the plot fits on the results matrix. This will inform the Grant payment rate for the plot.

## PBR PROJECT - Winter Bird Food Assessment Form

<b>Agreement Holder:</b>	<b>Agreement Reference:</b>
<b>RLR Parcel Number:</b>	<b>Plot Size:</b>
<b>Assessor:</b>	<b>Date Assessment Completed:</b>

### Instructions

- Assessments of the winter bird food plots (WBF) plots need to be carried out between 1<sup>st</sup> September and 15<sup>th</sup> October in 2017 & between 1 September and 30<sup>th</sup> September in 2018.
- Take 10 representative assessments for each plot. The assessments should be taken at regular intervals across the plot ensuring the whole plot area is assessed. Do not take any assessments within 1 metre of the plot boundary. The recordings from all 10 assessments should give an accurate representation of the WBF plot. Do not assess just the best areas. Mark on a map the approximate area where the assessment was carried out. A photograph must be taken of each quadrat area and be provided on request.
- At each assessment point, count the number of seed heads/seed producing plants using a 1 metre square quadrat. Only count the crops specified in the table. Do not count naturally occurring plants (e.g. thistles, fat hen, and redshank) or any structural crops like dwarf sorghum or reed millet in the assessment.
- To count as 'present' within the quadrat, the seed producing plants need to be clearly visible and either equal or exceed the thresholds stated in the PBR Manual and in the table below. Where the crop equals or exceeds the relevant threshold, mark the appropriate box on the scoring sheet. Triticale, wheat, oats or barley count as one crop. Do not record as separate crops. On the record sheet, the final column can be filled in or 'ticked' if the crop has been recorded in at least 5 out of the 10 assessments.
- Use the average crop cover and number of species to work out where the plot fits on the results matrix. This will inform the payment rate for the plot.

**PBR PROJECT - Winter Bird Food Assessment Table**

	No. of Plants/Seed Heads Required per Quadrat	Quadrat 1	Quadrat 2	Quadrat 3	Quadrat 4	Quadrat 5	Quadrat 6	Quadrat 7	Quadrat 8	Quadrat 9	Quadrat 10		Tick if Present in 5 or more Quadrats
<b>Crop</b>													
Cereals	25 Seed Heads												
Red Millet	4 Seed Heads												
White Millet	4 Seed Heads												
Quinoa	2 Plants*												
Fodder Radish	1 Plant*												
Dwarf Sunflowers	1 Plant*												
Linseed	5 Plants*												
Mustard	2 Plants*												
Gold of Pleasure	5 Plants*												
Spring OSR	1 Plant*												
Buckwheat	4 Plants*												
<b>Number of Crops Present in 5 or more Quadrats</b>													

\* Must be a seed producing plant

# Pollen & Nectar (PN) - Plot Assessment Methodology

## Plot Assessment - Year 1

### Timing of survey

Assessments of the Pollen & Nectar (P&N) plots need be carried out between 15th June and 15<sup>th</sup> October in 2017. This will allow you to cut the plots regularly during the first spring/summer after sowing period to help control weeds and aid the establishment of the sown flower species.

To ensure the majority of sown flower species are flowering at the time of the first plot assessment - to aid with plant identification – it is recommended that all cutting on autumn (2016) sown plots is completed a minimum of 4 weeks prior to completion of the plot assessment. A longer gap of 6-8 weeks is recommended for plots established in 2017.

### What to remember

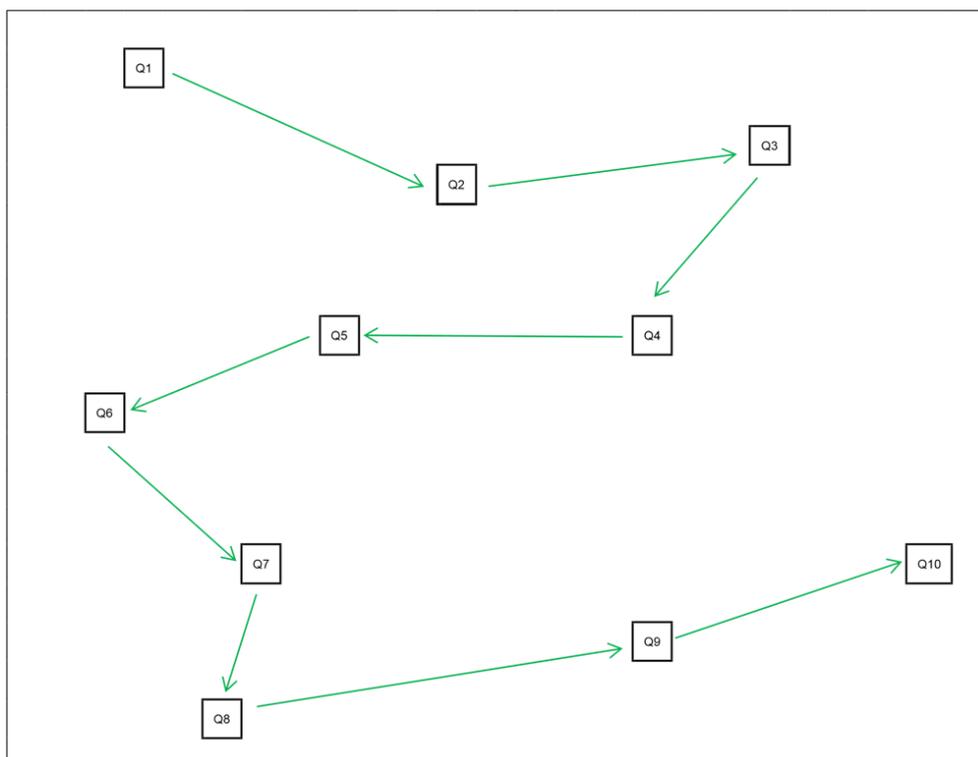
The following will be required to complete the plot assessment:

- copy of the Agreement Map
- plot assessment record sheet
- plant ID sheet
- 1 metre square quadrat or materials required to create one
- camera (or smartphone)
- copy of seed mixture label

### How to complete the survey

You must complete 10 visual assessments using a 1-metre square quadrat randomly placed across each plot. The plot assessment should be completed by walking across the plot and stopping at regular intervals to ensure the whole plot is sampled.

Example field survey:



Each time you stop, place the 1-metre square quadrat immediately in front of you, and record all sown flower species present on the plot assessment record form.

On the record sheet, where a sown flower species is recorded in at least 5 of the 10 assessments (i.e. there are 5 ticks against a particular flower species), record it as being present in the plot as a whole by adding a tick to the final column in the table.

Add up the number of ticks in the final column to work out where the plot fits on the results matrix. This will inform the payment rate for the plot.

In the example below the plot achieved 6 sown flower species.

### What to remember

The following will help you complete the plot assessment:

- copy of the agreement map
- plot assessment record sheet
- plant ID sheet
- 1 metre square quadrat or materials required to create one
- camera (or smartphone)
- copy of seed mixture label

### Additional Information

You must only record those species that were sown in the original seed mixture.

To assess the sward in a fair and consistent manner it is important that the sward surveyed at each of the selected random survey points is representative of the sward across the plot as a whole.

It is recommended that you do not complete any stops within 4 metres of the plot boundary.

A photograph must be taken of each surveyed quadrat and be provided on request.

**Pollen & Nectar (PN)**  
Example Plot Assessment Form - Year 1

<b>Agreement holder</b>		A N Other				<b>Plot size (ha)</b>				0.50 ha		
<b>Agreement reference</b>		AR1				<b>Assessor</b>						
<b>RLR Number</b>	<b>Field</b>	<b>Parcel</b>	TMXXXXXXXX				<b>Date assessment completed</b>				1 <sup>st</sup> July 2018	
<b>Sown flower species present</b>	<b>QUADRAT</b>										<b>Enter a TICK ✓ in this column for all sown flower species present in 5 or more quadrats</b>	
	1	2	3	4	5	6	7	8	9	10		
	<b>Record all sown flower species present in each quadrat by entering X in the appropriate box</b>											
Alsike clover	X	X		X	X	X	X	X	X	X	✓	
Red clover	X	X	X	X	X	X	X	X	X	X	✓	
Crimson clover												
White clover												
Sainfoin												
Lucerne	X		X		X	X	X	X			✓	
Bird's-foot trefoil	X	X	X	X	X	X	X		X	X	✓	
Black medick / yellow trefoil		X	X	X		X	X	X	X		✓	
Common vetch	X		X	X			X		X	X	✓	
Black knapweed		X			X				X			
Yarrow		X	X			X		X				
Oxeye daisy												
Musk mallow	X				X		X			X		
Wild carrot			X		X		X					
Field scabious												
Sweet clover												
Fenugreek												
Red campion												
Phacelia												
Borage												
<b>Number of species recorded in 5 or more stops</b>										<b>6</b>		

**Pollen & Nectar (PN)**  
PBR Plot Assessment Form - Year 1

<b>Agreement holder</b>		<b>Plot size</b>									
<b>Agreement reference</b>		<b>Assessor</b>									
<b>RLR Field Parcel Number</b>		<b>Date assessment completed</b>									
<b>Sown flower species present</b>	<b>QUADRAT</b>										<b>Enter a TICK ✓ in this column for all sown flower species present in 5 or more quadrats</b>
	1	2	3	4	5	6	7	8	9	10	
	<b>Record all sown flower species present in each quadrat by entering X in the appropriate box</b>										
Alsike clover											
Red clover											
Crimson clover											
White clover											
Sainfoin											
Lucerne											
Bird's-foot trefoil											
Black medick / yellow trefoil											
Common vetch											
Black knapweed											
Yarrow											
Oxeye daisy											
Musk mallow											
Wild carrot											
Field scabious											
Sweet clover											
Fenugreek											
Red campion											
Phacelia											
Borage											
<b>Number of species recorded in 5 or more stops</b>											

## Pollen & Nectar (PN) Plot Assessment Methodology - Year 2

### Timing of survey

Assessments of Pollen & Nectar (PN) plots will be carried out between 1st June and 30th September in 2018.

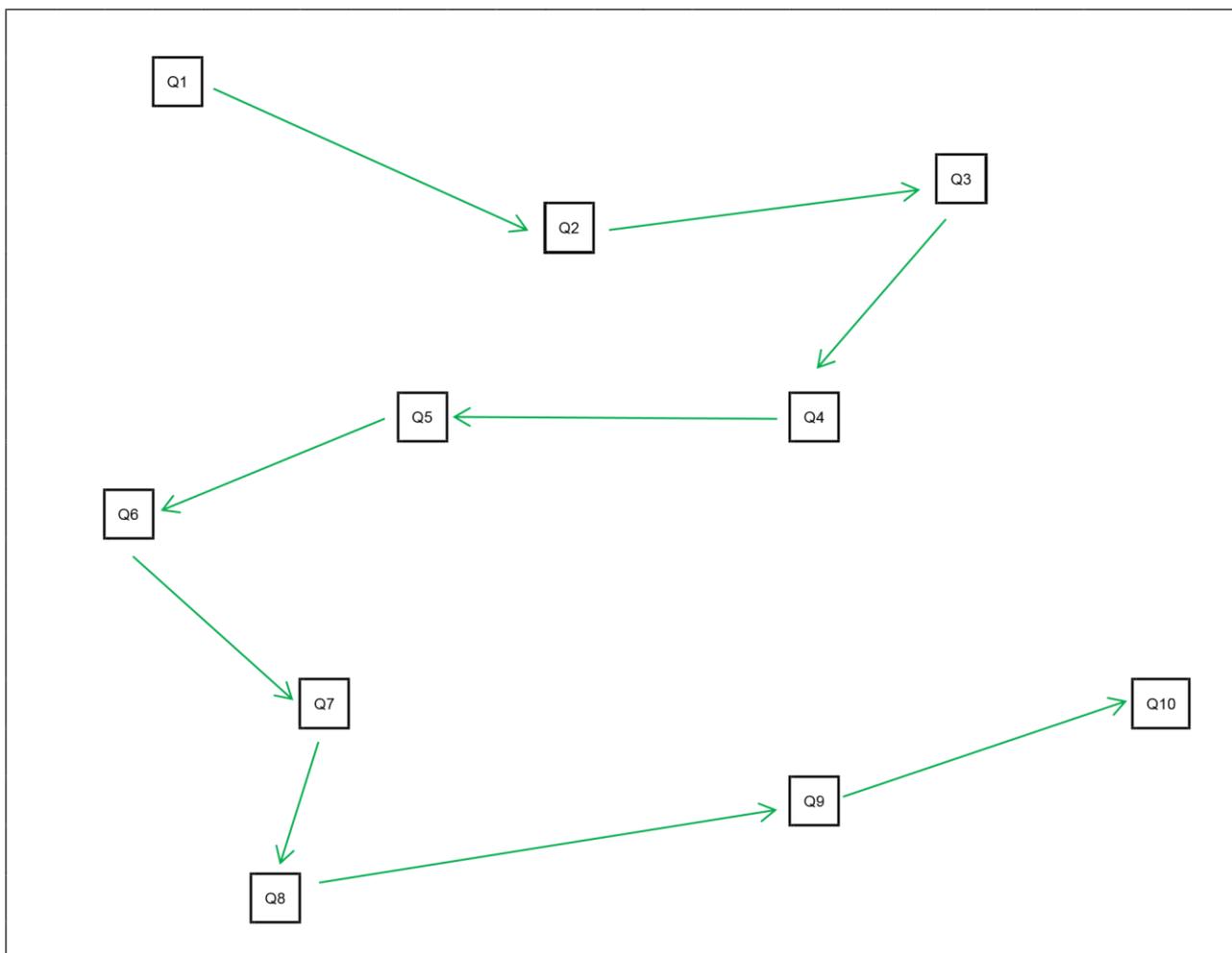
In practice you should aim to complete the plot assessment when the majority of flower species are either flowering or have recently flowered as this will help with their identification. In most years, the peak flowering period is typically from the last week of June to mid-July.

Please note that where half of a plot or plots have been cut early summer (i.e. between 21 May and 7 June) do not complete the plot assessment for a minimum of 6 weeks after cutting to ensure the sown flower species are given sufficient time to re-grow to flowering.

### How to complete the survey

You must complete 10 visual assessments using a 1-metre square quadrat randomly placed across each plot. The plot assessment should be completed by walking across the plot and stopping at regular intervals to ensure the whole plot is sampled.

Example field survey:



Each time you stop place the 1-metre square quadrat immediately in front of you and record on the plot assessment record form the following:

- sown flower species present
- % cover of sown flower species

On the record sheet, where a flower species is recorded in at least 5 of the 10 assessments (i.e. there are 5 ticks against a particular species), record it as being present in the plot as a whole by adding a tick to the final column in the table. Add up the number of ticks in the final column.

For the % cover metric you simply need to average the % cover for the 10 quadrats.

In the example below the P&N plot achieved 6 sown flower species and an average % cover of 93.7% which means that the Tier 10 performance tier has been achieved and a payment rate of £705/ha.

### What to remember

The following will help you complete the plot assessment:

- copy of the agreement map
- plot assessment record sheet
- plant ID sheet
- 1 metre square quadrat or materials required to create one
- camera (or smartphone)
- copy of seed mixture label

### Additional Information

You must only record those species that were sown in the original seed mixture.

To assess the sward in a fair and consistent manner it is important that the sward surveyed at each of the selected random survey points is representative of the sward across the plot as a whole.

It is recommended that you do not complete any stops within 4 metres of the plot boundary.

A photograph must be taken of each surveyed quadrat and be provided on request.

**Pollen & Nectar (PN)**  
**Example Plot Assessment Form - Year 2**

<b>Agreement holder</b>	A N Other		<b>Plot size (ha)</b>		0.50 ha						
<b>Agreement reference</b>	AR1		<b>Assessor</b>								
<b>RLR Field Parcel Number</b>	TMXXXXXXXX		<b>Date assessment completed</b>		1 <sup>st</sup> July 2018						
			<b>Start Time/End Time</b>		10 am – 11.15am						
<b>Sown flower species present</b>	<b>QUADRAT</b>										<b>Enter a TICK ✓ in this column for all sown flower species present in 5 or more quadrats</b>
	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10</b>	
	<b>Record all sown flower species present in each quadrat by entering X in the appropriate box</b>										
Alsike clover	X	X		X	X	X	X	X	X	X	✓
Red clover	X	X	X	X	X	X	X	X	X	X	✓
Crimson clover											
White clover											
Sainfoin											
Lucerne	X		X		X	X	X	X			✓
Bird's-foot trefoil	X	X	X	X	X	X	X		X	X	✓
Black medick / yellow trefoil		X	X	X		X	X	X	X		✓
Common vetch	X		X	X			X		X	X	✓
Black knapweed		X			X				X		
Yarrow		X	X			X		X			
Oxeye daisy											
Musk mallow	X				X		X			X	
Wild carrot			X		X		X				
Field scabious											
Sweet clover											
Fenugreek											
Red campion											
Phacelia											
Borage											
<b>Number of species recorded in 5 or more stops</b>										<b>6</b>	
<b>% cover sown flower species</b>	87	95	95	95	90	100	98	100	85	92	
<b>Average % cover</b>	93.7%										

**Pollen & Nectar (PN)**  
PBR Plot Assessment Form - Year 2

<b>Agreement holder</b>		<b>Plot size</b>									
<b>Agreement reference</b>		<b>Assessor</b>									
<b>RLR parcel number</b>		<b>Date assessment completed</b> <b>Start Time/End Time</b>									
<b>Sown flower species present</b>	<b>QUADRAT</b>										Enter a TICK ✓ in this column for all sown flower species present in 5 or more quadrats
	1	2	3	4	5	6	7	8	9	10	
	Record all sown flower species present in each quadrat by entering X in the appropriate box										
Alsike clover											
Red clover											
White clover											
Sainfoin											
Lucerne											
Bird's-foot trefoil											
Black medick / Yellow trefoil											
Common vetch											
Black knapweed											
Yarrow											
Oxeye daisy											
Musk mallow											
Wild carrot											
Sweet clover											
Fenugreek											
Red campion											
White campion											
Phacelia											
Borage											
<b>Number of species recorded in 5 or more stops</b>											
<b>% cover sown flower species</b>											
<b>Average % cover</b>											

## Other guidance

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***Natural England RBAPS Arable Pilot – Winter Bird Food (WBF) Plant Identification Guide***



**Quinoa seed heads and triticale (Photo: David Ward)**

## Winter Bird Food (WBF) Plant ID Guide – Main Eligible Crops

### SPECIES

#### Mustard - *Brassica nigra*

**Growth habit:** a brassica which can be hard to differentiate in the early growth stages and superficially closely resembles spring oilseed rape and fodder radish.

**Leaf:** it has a much coarser and hairy leaf with white spine like hairs on the leaf and stem compared to spring oilseed rape. Looks like fodder radish in the early stages.

**Flower:** similar to spring oilseed rape but tend to be a duller yellow. Flowers often covered in pollen beetles.

**Seed head:** very hairy/bristly and much shorter/stouter than fodder radish and OSR.

### Seedling



Photo: David Whiting

### Leaf



Photo: David Whiting

### Flower



Photo: David Whiting

### Seed Head



Photo: David Whiting

## Winter Bird Food (WBF) Plant ID Guide – Main Eligible Crops

### SPECIES

Fodder Radish - *Raphanus sativus oleiformis*

**Growth habit:** as it develops it forms a broad multi-branched plant, and as it gets older, the seed pods will often partially collapse.

**Leaf:** cotyledons are typically kidney shaped as with most brassicas. As the true leaves mature they start off entire but the plant soon starts to form deeply segmented leaves. In the early growth stages, it can look very similar to many other brassicas such as mustard or spring oilseed rape.

**Flower:** variable colour ranging from white to lilac/purple.

**Seed head:** short, bulbous hairless seed heads. Unopened seed heads may still be present into January.

### Seedling



Photo: David Whiting

### Leaf



Photo: David Whiting

### Flower



Photo: David Whiting

### Seed Head



Photo: David Whiting

## Winter Bird Food (WBF) Plant ID Guide – Main Eligible Crops

### SPECIES

#### Spring oilseed rape - *Brassica napus*

**Growth habit:** tall, broad multi branched annual. Very similar to winter OSR but smaller with fewer branches and less seed heads particularly when grown in WBF plots without nitrogen.

**Leaf:** smooth leaf, just like winter OSR.

**Flower:** vibrant yellow

**Seed head:** smooth hairless seed pods containing a large number of back seeds when ripe.

### Seedling



Photo: David Whiting

### Leaf



Photo: David Whiting

### Flower



Photo: David Ward

### Seed Head



Photo: David Whiting

## Winter Bird Food (WBF) Plant ID Guide – Main Eligible Crops

### SPECIES

#### Gold of Pleasure - *Camelina sativa*

**Growth habit:** An oilseed crop with some similarities to linseed but will grow much taller than linseed.

**Leaf:** in the early stages, the leaves emerge singly and are relatively narrow. As the plant develops the leaves become pointed and half clasp the stem.

**Flower:** pale yellow flowers

**Seed head:** small oval shaped seed pods on multiple branches.

### Seedling



Photo: David Ward

### Leaf



Photo: David Whiting

### Flower



Photo: David Whiting

### Seed Head



Photo: David Whiting

## Winter Bird Food (WBF) Plant ID Guide – Main Eligible Crops

### SPECIES

#### Linseed - *Linum usitatissimum*

**Growth habit:** in the early growth stages it is relatively easy to identify by its small leaves arranged around a single stem. However, plants can be small and often infrequent due to flea beetle damage which often occurs as soon as the plant emerges.

Typically only grows 30cm or less, particularly in the absence of nitrogen and so will often be found in the bottom of the crop.

**Leaf:** very small oval shaped leaves.

**Flower:** pale blue/lilac occasionally white

**Seed head:** flowers develop into distinctive small brown seed heads or 'bolls'.

### Seedling



Photo: David Whiting

### Leaf



Photo: David Whiting

### Flower



Photo: David Whiting

### Seed Head



Photo: David Whiting

## Winter Bird Food (WBF) Plant ID Guide – Main Eligible Crops

### SPECIES

#### Quinoa - *Chenopodium quinoa*

**Growth habit:** an upright annual crop very similar to fat-hen and other goosefoot species. It can grow to 1-1.5 metres tall in the right conditions.

**Leaf:** in the early stages the plant and leaves look exactly like fat hen. As it grows the leaves of quinoa are more mealy and tend to be much broader than fat hen. Another ID tip is to look at the underside of the cotyledons. With quinoa they are green whereas the underside of the cotyledons of fat hen are purple.

**Seed head:** the colourful seed heads are its most distinguishing feature. In the autumn they can be a mixture of reds, yellows and orange.

### Seedling



Photo: David Whiting

### Leaf



Photo: David Whiting

### Growth Habit



Photo: David Ward

### Seed Head



Photo: David Whiting

## Winter Bird Food (WBF) Plant ID Guide – Main Eligible Crops

### SPECIES

#### Buckwheat - *Fagopyrum esculentum*

**Growth habit:** very fast growing annual with stems which are often red in colour. Tends to be low growing and may be below the crop canopy. Typically used as a late sown crop where the original WBF seed mix has failed to establish.

**Leaf:** relatively easy to identify with its pale green heart shaped pointed leaves.

**Flower:** it has pinky white flowers.

**Seed head:** it has an unusual bulbous seed head.

### Seedling



Photo: David Whiting

### Leaf



Photo: David Whiting

### Flower



Photo: David Whiting

### Seed Head

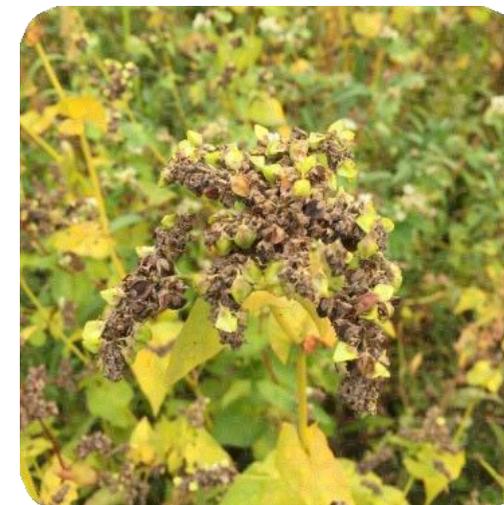


Photo: David Ward

## Winter Bird Food (WBF) Plant ID Guide – Main Eligible Crops

### SPECIES

#### Sunflower - *Helianthus annuus*

**Growth habit:** tall, fast growing upright annual which can reach 2 metres in height although sunflowers in winter bird food mixtures are usually the dwarf variety which is much shorter.

**Leaf:** the leaves occur in pairs and quite large and often pale green compared to most other species found in winter bird food mixes. The height and leaf pattern tends to make them stand out and easy to identify even when small.

**Flower:** unmistakable yellow flower

**Seed head:** dark brown circular seed head embedded with seeds.

### Seedling



Photo: David Whiting

### Growth Habit



Photo: David Whiting

### Flower



Photo: David Whiting

### Seed Head



Photo: David Whiting

## Winter Bird Food (WBF) Plant ID Guide – Main Eligible Crops

### SPECIES

#### White Millet - *Panicum miliaceum*

**Growth habit:** an annual cereal that can look a bit like maize at the seedling growth stage. It can be very variable in crop height ranging from 30 cm to over a metre depending on growing conditions. Tends to set seed later compared to red millet. It also tends to stand much more upright compared to red millet.

**Leaf:** the leaves emerge singly with distinctive green stripes visible on the stem below the point that the leaf blade attaches to the stem.

**Seed head:** white millet also has a much more compact white seed head with large numbers of individual seeds compared to red millet.

### Seedling



Photo: David Whiting

### Stem



Photo: David Whiting

### Seed Head



Photo: David Whiting

#### Red Millet - *Panicum miliaceum*

**Growth habit:** like white millet, it can be very variable in crop height. It tends to be earlier maturing than white millet and is weaker stemmed. It is differentiated from white millet by its red stem and red/brown seed heads.

**Leaf:** the leaves emerge singly with distinctive dark red/purple stripes visible on the stem below the point that the leaf blade attaches to the stem. As red millet plants mature leaf tips and margins become dark red/purple whereas the leaves of white millet remain green.

**Seed head:** red millet has a loose dark red-coloured drooping seed head.



Photo: David Whiting



Photo: David Whiting



Photo: David Whiting

## Winter Bird Food (WBF) Plant ID Guide – Main Eligible Cereal Crops

### SPECIES

#### Oats - *Avena sativa*

**Growth habit:** similar in growth habitat to the other cereals. The distinguishing features are the seed head and absence of auricles – see below. Typically not included in WBF mixes.

**Leaf:** auricles absent, leaf-sheath and blade hairless (scattered hair on some varieties). Ligule medium length. Leaf-blades twist anticlockwise.

**Seed head:** easy to identify when the seed head is present, with its spreading panicle and drooping seeds.

### Seed Head



Photo: David Whiting

#### Spring barley - *Hordeum vulgare*

**Growth habit:** very distinctive although spring barley plants in WBF plots tend to tiller less and brackle over in early autumn and so are less obvious.

**Leaf:** much smaller flag leaf compared to the other cereals. Auricles long, slender and hairless, leaf-sheath and blade usually hairless, scattered hairs on some varieties. Ligule of medium length. Leaf blades twist clockwise.

**Seed head:** easily identified with the long awns although the heads are often much smaller compared to a commercial crop.



Photo: David Ward

### SPECIES

#### Triticale - *Triticosecale*

**Growth habit:** it is a cross of wheat and rye. Typically stands much better than wheat or barley and will tend to retain the grain in the ear. It is much more tolerant of rabbit/hare damage.

**Leaf:** the leaves are larger than barley but not as big as wheat. Auricles blunt and hairy, leaf-sheath and blade hairy. Ligule of medium length. Leaf-blades twist clockwise.

**Seed head:** the main identifying feature is the relatively long ear with awns.

### Seed Head



Photo: David Whiting

#### Wheat - *Triticum aestivum*

**Growth habit:** tends to be much shorter with fewer tillers in WBF plots.

**Leaf:** the dark green broad flag leaf and leaves 1 & 2 are very notable in a commercial crop but less obvious in a WBF plot. Auricles are blunt and hairy, leaf-sheath and blade always hairy. Ligule of medium length. Leaf blades twist clockwise.

**Seed head:** easy to identify but compared to a commercial crop the ears are often much smaller with fewer grain sites.



Photo: David Whiting

## Winter Bird Food (WBF) Plant ID Guide – Common Structural Crops\*

### SPECIES

#### Reed Millet - *Echinochloa esculenta*

**Growth habit:** a tall, erect plant typically included in seed mixes to provide late season cover and helps provide structural support to other crops such as red and white millet.

**Leaf:** similar to white and red millet.

**Seed head:** although not usually included for its seed production, it can produce a dark coloured seed head with dense clusters of seed.

### Seed Head



Photo: David Ward

### SPECIES

#### Dwarf Sorghum

**Growth habit:** another plant which is often included in seed mixes to provide structure and cover over winter. Often forms a large plant and so stands out compared to anything else.

**Leaf:** very broad which is similar to maize.

**Seed head:** will produce a flower head in some years, however, the volume of seed produced is highly variable and of questionable feed value for farmland wildlife.

### Seed Head



Photo: David Ward

\* Structural crops can be sown but they do not count as an eligible paying crop in the WBF plot assessment.

## SPECIES

### Barnyard Grass - *Echinochloa crus-galli*

An increasingly common contaminant of some wild bird seed mixtures.

Very prolific seed production which can be a serious problem, outcompeting everything else. Where plants have been allowed to set seed, plots can be nothing but barnyard grass +/- yellow foxtail in the worst cases. Easily recognised when it has set seed and exhibits multiple branches of small brown/purple seed on a tall main stem.

## Seed Head



Photo: David Whiting

## SPECIES

### Yellow Foxtail - *Setaria pumila*

Tends to occur in combination with barnyard grass although in not such high populations.

Easy to identify by its cylindrical ear.

The picture shows one seed head complete with seed whilst the other shows the seed head once the seed has shed.

## Seed Head



Photo: David Ward

- Rogue millet species such as barnyard grass and yellow foxtail seed can be a contaminant of winter bird food seed mixes, albeit at very low levels. However in most situations, the seed is present in the soil from previous years when the plants were allowed to set seed. These millet species do not count as an eligible paying crop.

Lead author:

- David Ward (NE)

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**YORKSHIRE DALES**  
National Park Authority



***Natural England RBAPS Arable Pilot – Pollen and Nectar (PN) Plant Identification Guide***

All photos © David Whiting



Photo: crimson clover in Pollen & Nectar plot (David Whiting, May 2017).

## SPECIES

**Bird's-foot trefoil** - *Lotus corniculatus*

**Growth habit:** vigorous and erect.

**Leaf:** oval hairy leaflets on flower stalks appear trifoliate but have a lower pair arising from base of stalk.

**Flower:** yellow and reddish orange hence the local name 'eggs and bacon'.

**Flowering period:** May - September.

### Additional information:

- seed pods are black and spread out to resemble a bird's foot hence its common vernacular name;
- is slower to establish but more persistent than other faster growing legumes such as red clover;
- a different shaped legume flower to clovers that appeals to different insects;
- agricultural cultivars have hollow stems in contrast to native bird's-foot trefoil which has solid stems. In addition, the wild cultivar exhibits a low, creeping growth habit and tends to have smaller more orange/reddish flowers.

**Seedling**



**Leaf**



**Growth habit**



**Flower**



## SPECIES

**Black medick** - *Medicago lupulina*

**Growth habit:** low growing hardy annual (occasionally biennial) that can behave like a perennial due to the production of high levels of viable seeds in good growing conditions.

**Leaf:** downy, trifoliate leaflet (5-20 mm) with a toothed margin and distinctive tip at the end of each leaflet. The petiole (leaf stalk) of the central leaflet is noticeably longer than for the other two leaflets.

**Flower:** yellow.

**Flowering period:** April - August.

### Additional information:

- distinctive black kidney-shaped coiled seed pods;
- can outcompete less vigorous, slower-growing flower species such as bird's-foot trefoil in the first year after sowing so keep the seed rate low ie max 0.50 kg/ha;
- can tolerate cutting in first year but will not flower if cut too close to flowering.

Seedling



Leaf



Growth habit



Flower



## SPECIES

Lucerne - *Medicago sativa*

**Growth habit:** perennial.

**Leaf:** during the seedling stage lucerne can resemble a number of other clover species when the trifoliate leaves have roundish leaflets. As the seedlings mature the leaflets elongate and the leaf margins become partially toothed unlike sweet clover which is completely toothed. As per *Medicago lupulina* the petiole (leaf stalk) of the central leaflet is noticeably longer than the other two leaflets.

**Flower:** purple.

**Flowering period:** June - September.

### Additional information:

- seed pod is spiral shaped typically with 2-3 turns;
- slow to establish but increases in vigour from years 2 and 3;
- very deep rooting, drought resistant legume best suited to alkaline free-draining soils with a pH in the range 6.8 - 7.5;
- poaching, overgrazing and mechanical damage can reduce its persistence within a sward - to protect their crowns do not cut or hard graze established lucerne plants below 10 cm in height;
- can cause bloat in cattle so be mindful of this if using cut material for forage;

Seedling



Leaf



Growth habit



Flower



## SPECIES

**Sweet clover** - *Melilotus officinalis*

**Growth habit:** hairless biennial.

**Leaf:** trifoliate leaf consisting of three toothed (along entire leaf margin) leaflets 15-20 mm. As per *Medicago lupulina* and *Medicago sativa* the petiole (leaf stalk) of the central leaflet is noticeably longer than the other two leaflets.

**Flower:** yellow (occasionally very pale to white).

**Flowering period:** June - September.

### Additional information:

- does not respond well to hard topping so do not cut below 10 cm;
- not normally winter hardy, killed off by sustained frost;
- as a biennial sweet clover will flower in its second year and die BUT can persist and dominate over time if it can freely re-seed into an open, less competitive sward.

**Seedling**



**Leaf**



**Growth habit**



**Flower**



## SPECIES

**Sainfoin** - *Onobrychis viciifolia*

**Growth habit:** erect (sometimes prostrate) perennial.

**Leaf:** single (unifoliate) first true leaf on long petiole (leaf stalk). Later leaves are pinnate with 6-12 pairs of leaflets similar to common vetch. Please note that a sainfoin leaf ends with a terminal leaflet whereas a common vetch leaf ends with a tendril.

**Flower:** bright pink with red veins.

**Flowering period:** June - September.

### Additional information:

- distinctive large warty seed pod that needs to be sown deeper (to 2 cm) than most other flower species;
- thrives on free draining alkaline soils (pH 6.2 and above);
- extremely drought resistant and capable of growing on very poor soils;
- to protect the crowns of established plants DO NOT cut below 10 cm.

**Seedling**



**Leaf**



**Growth habit**



**Flower**



## SPECIES

**Alsike clover** - *Trifolium hybridum*

**Growth habit:** short term perennial lasting 3-5 years.

**Leaf:** trifoliate leaf. Leaf margin is toothed with no hairs. Leaflets do not carry the inverted "V" mark. There are no leaves on the flower stems. Leaf stems originate at the same point off the main stem as the separate flower stalks. Point of stipule much longer than red clover.

**Flower:** white flushed with pink below.

**Flowering period:** June - September.

### Additional information:

- slower to grow in the spring than red clover;
- grows well on heavy and acidic soils.

**Seedling**



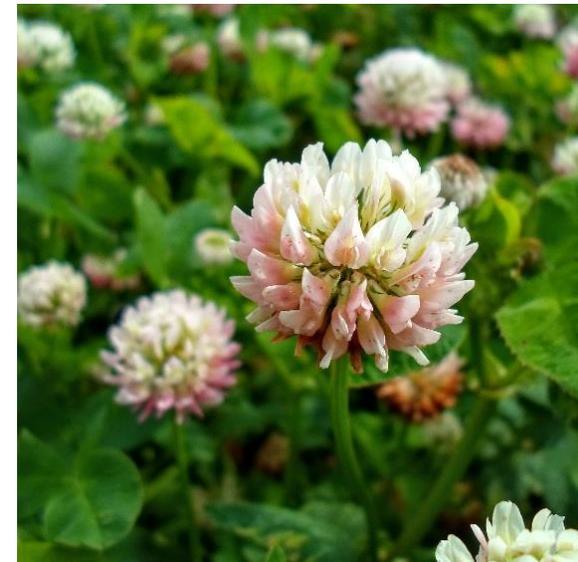
**Leaf**



**Growth habit**



**Flower**



## SPECIES

**Crimson clover** - *Trifolium incarnatum*

**Growth habit:** fast growing hardy annual that will provide a wonderful array of crimson flowers in first summer after sowing

**Leaf:** green elliptical trifoliate leaf sometimes with crimson colouration along leaf margin.

**Flower:** vivid dark red. NB species name '*incarnatum*' means blood red.

**Flowering period:** May - July.

### Additional information:

- not always winter hardy so is more consistent when included in spring sowings;
- can persist within swards beyond the first year if flowers are left to set seed before cutting although seed production is variable;
- can tolerate cutting but will not flower if cut too close to flowering.

**Seedling**



**Leaf**



**Growth habit**



**Flower**



## SPECIES

Red clover - *Trifolium pratense*

**Growth habit:** hairy perennial lasting 3-5 years

**Leaf:** trifoliolate leaf comprising of elliptical/ovate leaflets marked with an inverted 'V'. Leaf margin generally hairy and untoothed in contrast to white clover. Stipules triangular and purple veined and much shorter than alsike clover.

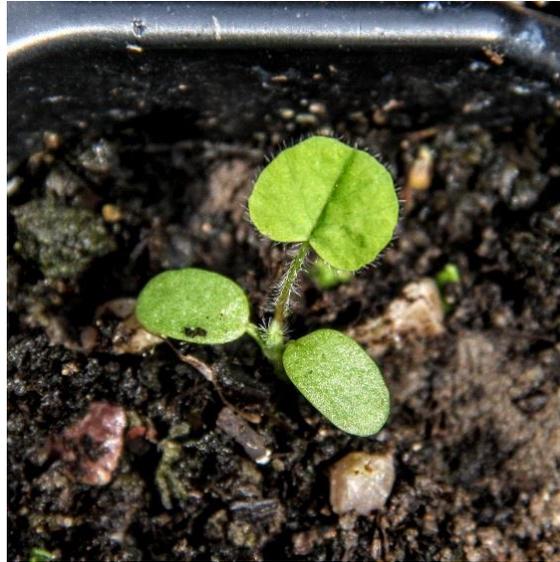
**Flower:** deep pinkish/purple color.

**Flowering period:** June - September.

### Additional information:

- suited to a range of soil types except those with a pH below 5.0.
- wild red clover plants are typically smaller and less erect than agricultural cultivars. They also have toothed leaf margins, solid stems and darker flowers.

Seedling



Leaf



Growth habit



Flower



## SPECIES

**White clover** - *Trifolium repens*

**Growth habit:** creeping rooting perennial herb

**Leaf:** trifoliate leaf typically comprising of 3-4 oval leaflets that may have an inverted 'V' mark on a long stalk. Leaf margin generally toothed with no hairs.

**Flower:** mainly white, occasionally tinged with pink or purple. Flower stems originate at ground level from the stolon, are taller than leaf stems and contain no leaves.

**Flowering period:** June - September.

### Additional information:

- more drought hardy than red clover;
- pigeons love to graze this;
- can be invasive in arable rotations so if in doubt leave out.

**Seedling**



**Leaf**



**Growth habit**



**Flower**



## SPECIES

**Fenugreek** - *Trigonella foenum-graecum*

**Growth habit:** a prostrate annual that prefers free-draining slightly heavy soils. It will tolerate lighter soils if they are fairly moist.

**Leaf:** long-stalked light green hairless leaves.

**Flower:** white or cream depending on variety.

**Flowering period:** anywhere between 2 and 4 months after sowing.

### Additional information:

- there are two distinct forms. The more common large seeded variety has slightly larger leaves and white flowers. This variety can only be cut once so allow to flower before topping. The smaller seeded variety has slightly smaller leaves, yellow flowers and will regrow after cutting.

**Seedling**



**Leaf**



**Growth habit**



**Flower**



## SPECIES

**Common vetch** - *Vicia sativa*

**Growth habit:** annual which has a very variable growth habit ranging from erect to trailing to scrambling.

**Leaf:** leaflets 20-30 mm arranged in pairs (typically 4-8) with a terminal bristle on each leaflet. Please note that a common vetch leaf ends with a tendril whereas a sainfoin leaf ends with a terminal leaflet.

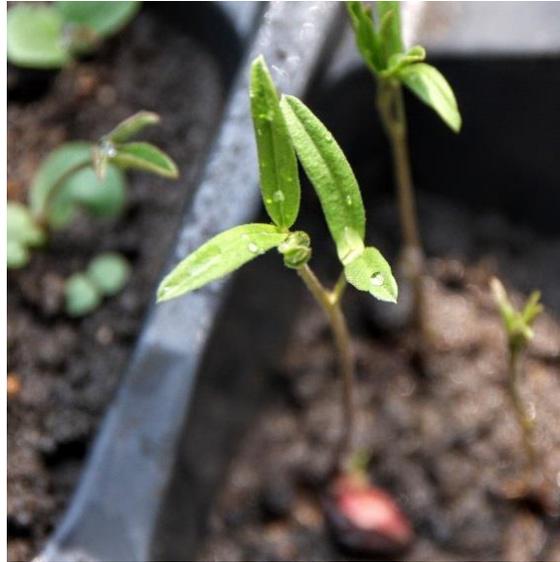
**Flower:** purple pink.

**Flowering period:** May - September.

### Additional information:

- seed pods are typically hairy and yellowish to brown in colour;
- winter varieties more frost tolerant than spring;
- can tolerate cutting and still flower if cut when small (up to 30 cm height) – **may die if cut too close to flowering.**

**Seedling**



**Leaf**



**Growth habit**



**Flower**



## SPECIES

**Yarrow** - *Achillea millefolium*

**Growth habit:** erect, tufted downy perennial herb.

**Leaf:** lanceolate, 5-15 cm long, 2-3 times pinnate. Lower leaves stalked upper stalkless and shorter.

**Flower:** consists of many flowerheads (consisting of dirty white/creamy disc florets and white/pink ray florets) arranged in a terminal umbel-like corymb.

**Flowering period:** June to September.

### Additional information:

- prefers free-draining soils;
- cheap and easy to grow;
- small, shallow flowers ideal for a wide range of small or short tongued insects.

**Seedling**



**Leaf**



**Growth habit**



**Flower**



## SPECIES

**Borage** - *Borago officinalis*

**Growth habit:** bristly erect annual.

**Leaf:** lower leaves oval and stalked. Upper leaves narrower, wavy edged and stalkless.

**Flower:** wonderful bright blue loosely branched flowers very attractive to pollinators.

**Flowering period:** June to October.

**Additional information:** very attractive to pollinators especially bees. Can be invasive and difficult to control as volunteers in future crops.

**Seedling**



**Leaf**



**Growth habit**



**Flower**



## SPECIES

**Common knapweed** - *Centaurea nigra*

**Growth habit:** erect, rough hairy perennial herb.

**Leaf:** the leaves are up to 25 centimetres long, usually deeply lobed, and hairy (although there can be considerable variation between individual plants – see photo). The lower leaves are stalked, whilst the upper ones are stalkless. Distinctive pale/white central vein (midrib).

**Flower:** bright purple 20-40 mm across.

**Flowering period:** June to Sept.

### Additional information:

- often referred to as black or lesser knapweed;
- long flowering period so ideal for autumn pollen;
- persistent even in taller grass dominant mixes;
- freely re-seeds itself into sward so can persist in sward for many years.

**Seedling**



**Leaf**



**Growth habit**



**Flower**



## SPECIES

**Oxeye daisy** - *Chrysanthemum leucanthemum*

**Growth habit:** erect, slightly hairy perennial.

**Leaf:** dark green basal rosette of long-stalked spoon shaped toothed leaves which are arranged alternately up the stem;

**Flower:** white classic daisy flower 25-50 mm across.

**Flowering period:** June to August.

### Additional information:

- normally establishes well in year 1 as a pioneer species similar to yarrow;
- cheap and easy to grow;
- small, shallow flowers ideal for a wide range of small or short tongued insects.

**Seedling**



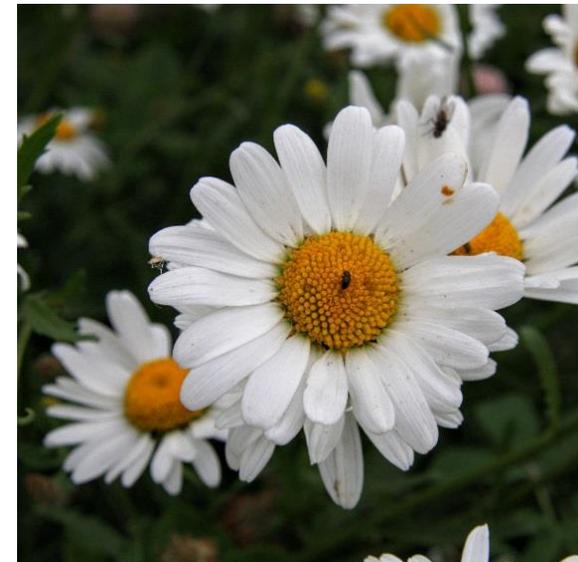
**Leaf**



**Growth habit**



**Flower**



## SPECIES

**Wild carrot** - *Daucus carota*

**Growth habit:** biennial

**Leaf:** 3 times pinnate, with oval-lanceolate, pinnatifid leaflets 5-8 mm long.

**Flower:** many white flowers 2-3mm arranged in an umbel.

**Flowering period:** June - August

### Additional information:

- prefer free draining calcareous soils;
- normally establishes well in year 1 as a pioneer species;
- the white flowers are a favourite with hover flies;
- the dried seed heads provide the perfect habitat for hibernating ladybirds.

**Seedling**



**Leaf**



**Growth habit**



**Flower**



## SPECIES

**Field scabious** - *Knautica arvensis*

**Growth habit:** erect roughly hairy perennial that grows between 25cm and 100cm in height. Very attractive to butterflies.

**Leaf:** basal leaves are usually unlobed, larger and hairier than stem leaves which are typically arranged in pairs and deeply pinnatifid (see photo for difference between stem and basal leaves).

**Flower:** 3-4 cm across blue violet .

**Flowering period:** July - September

### Additional information:

- expensive seed;
- can be slow to establish (up to 2 years);
- best suited to higher pH soils with lower nutrient levels.

**Seedling**



**Leaf**



**Growth habit**



**Flower**



## SPECIES

**Musk mallow** - *Malva moschata*

**Growth habit:** erect perennial herb.

**Leaf:** arranged alternately up the stem, 2-8 cm long and wide.

**Flower:** 3-6 cm diameter, with five bright rose pink petals with a truncated to notched apex, and a distinctive musky odour.

**Flowering period:** July - August

### Additional information:

- expensive seed;
- open flower with easy insect access;
- valuable late season flowering species for many insects.

**Seedling**



**Leaf**



**Growth habit**



**Flower**



## SPECIES

**Phacelia** - *Phacelia tanacetifolia*

**Growth habit:** annual.

**Leaf:** twice pinnate.

**Flower:** light purple.

**Flowering period:** May - August.

### Additional information:

- attractive to honey bees, hoverflies and other pollinators;
- can be competitive so keep seed rates below 5% of total seed rate (kg/ha);
- can tolerate cutting and still flower if cut when small (up to 30 cm height) – **will die if cut too close to flowering.**

**Seedling**



**Leaf**



**Growth habit**



**Flower**



## SPECIES

**Ribwort plantain** - *Plantago lanceolata*

**Growth habit:** rosette forming perennial.

**Leaf:** lanceolate with 3-5 strong parallel veins.

**Flower:** Leafless, silky, hairy flower stems 10-40 cm.  
Flowers 4 mm with long white stamens.

**Flowering period:** April - October.

### Useful information:

- can be invasive on droughty soils / over grazed swards where it is challenging to maintain good sward cover;
- slugs and snails do not like this species as the leaves are unpalatable;
- in dry sowing periods can become very dominant;
- has some value for bird seed;
- limited insect value – consider including hoary plantain instead.

**Seedling**



**Leaf**



**Growth habit**



**Flower**



## SPECIES

**Red campion** - *Silene dioica*

**Growth habit:** sticky hairy perennial (sometime biennial) herb with creeping rhizome. The plant grows to 30-90 cm, with branching stems.

**Leaf:** the deep green leaves are oval in shape, 3-8 cm long with an untoothed margin and pointed tips. Both the leaves and stems of the plant are hairy and slightly sticky. Upper leaves are stalkless and hairy arranged in opposite pairs. Leaves near to the base have short stalks.

**Flower:** bright rose-pink with 5 petals which are notched at the end and narrowed at the base.

**Flowering period:** March to October.

### Additional information:

- very long potential flowering period;
- is *Dioecious* ie male and female flowers are on different plants;
- produces a high volume of nectar;
- attractive to smaller solitary bees as they can access the pollen and nectar;
- unable to cope with prolonged periods of waterlogging so does not persist on heavy clay soils.

**Seedling**



**Leaf**



**Growth habit**



**Flower**



## SPECIES

**White campion** - *Silene latifolia*

**Growth habit:** annual, biennial or occasionally short-lived perennial growing to between 40-80 centimetres tall.

**Leaf:** young plants form a basal rosette of oval to lanceolate leaves 4-10 cm long, whilst older plants develop forked stems with leaves in opposite pairs.

**Flower:** white with 5 petals which are notched at the end and narrowed at the base.

**Flowering period:** May to September.

### Additional information:

- sun-loving plant most commonly found on light calcareous or sandy soils of pH 6.1 to 8.2;
- grows less well in the shade and on waterlogged soils but is resistant to drought.

**Seedling**



**Leaf**



**Growth habit**



**Flower**



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**YORKSHIRE DALES**  
National Park Authority





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