How to use agricultural support data from the Swedish Board of Agriculture

Usage at SLU and guidelines with focus on spatial data

Hur jordbrukarstöddata från Jordbruksverket kan användas – användning vid SLU och handledning med fokus på areella data

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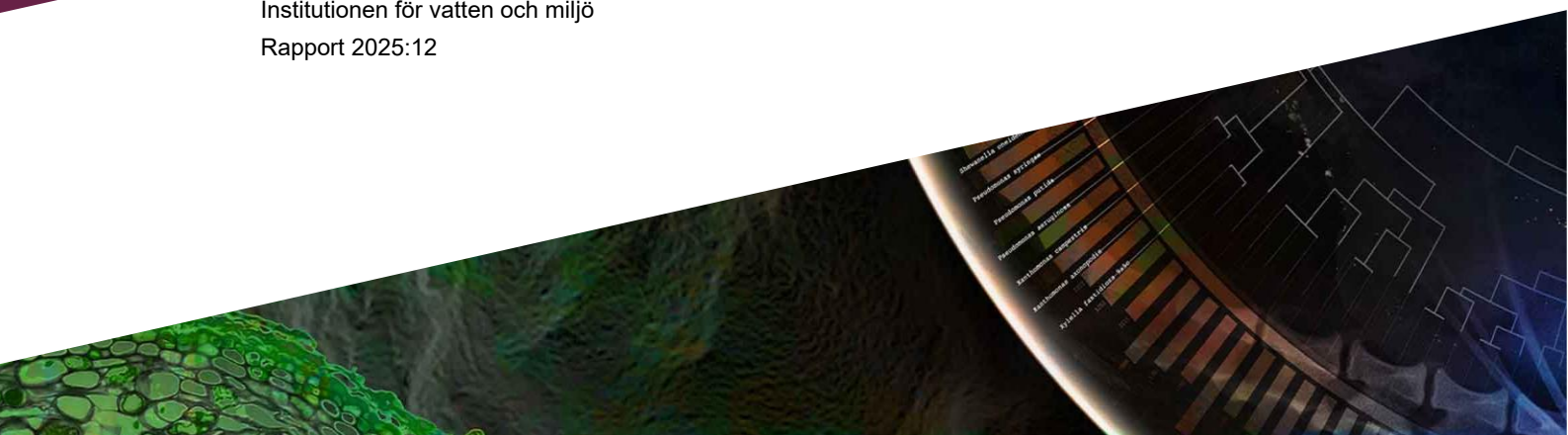
Rapport 2025:12



How to use agricultural support data from the Swedish Board of Agriculture. Usage at SLU and guidelines with focus on spatial data

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Utgivare:	Sveriges lantbruksuniversitet, Institutionen för vatten och miljö
Utgivningsår:	2025
Utgivningsort:	Uppsala
Serietitel:	Rapport / Sveriges lantbruksuniversitet, Institutionen för vatten och miljö
Nyckelord:	farmer’s block, agricultural parcel, farmers’ income support, environmental support, agricultural area, arable land, pasture, IACS

Sammanfattning

Jordbruksverket har omfattande data om jordbrukarstöd. Jordbruksblocken och skiftena ger detaljerad information om var olika fält finns och vilken gröda de odlas med ett visst år. Många anställda vid SLU använder dessa data, men alla känner inte till dem eller tycker att de är svåra att hitta.

I avsnittet "Quick user's guide to block and crop data for agricultural parcels" på sidan 11-12 finns en översiktlig genomgång vad man bör tänka på när man ska använda jordbruksblock och jordbruksskiften. Varje år efterfrågar SLU jordbruksblocken och jordbruksskiftena från Jordbruksverket och lagrar dessa på gis.slu.se.

Nyckelord: jordbruksblock, jordbruksskiften, gårdsstöd, miljöersättning, jordbruksmark, åkermark, betesmark, IAKS

Abstract

The Swedish Board of Agriculture has a lot of data about agricultural support. The farmer's block and parcel data gives detailed information about the location of the fields and what crop they have each year. Many employees at SLU use this data, but some are not aware of the data or find them hard to locate.

The "Quick user's guide to block and crop data for agricultural parcels" on pages 11-12 gives an overview on what to consider when working with this data. The farmer's block and parcel data is requested by SLU from the Swedish Board of Agriculture each year and is stored at gis.slu.se.

Keywords: farmer's block, agricultural parcel, farmers' income support, environmental support, agricultural area, arable land, pasture, IACS

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Word list (English – Swedish)

The following translations are used in this report. Translations of various farmer support categories are also given in Table 2 on page 16.

English	Swedish
Agricultural area	Jordbruksmark
Agricultural parcel	Skifte, jordbruksskifte
Arable land	Åker (åkermark)
Buffer strip (or Buffer zone)	Skyddszon
Cultivated grassland (may also be called Ley farming)	Vallodling
EU's common agricultural policy (CAP)	EU:s gemensamma jordbruks-politik (GJP)
Environmental (improvement) support (may also be called Agri-environmental payment/support)	Miljöersättning
Farmer's block (may also be called Reference parcel)	Block, jordbruksblock
Farmers' income support (may also be called Single farm payment)	Gårdsstöd
Field islet	Åkerholme
Greening (may also be called Green direct payment)	Förgröningsstöd
IACS	IAKS
Ineligible	Ej stödberättigande
Ley	Vall
Mown meadows	Slåtterängar
Pasture	Bete
Pastures	Betesmark
Payment entitlement	Stödrätt
Rural Development Programme	Landsbygdsprogrammet (LBP)
Seasonal mountain holding	Fäbod
Swedish Board of Agriculture	Jordbruksverket
Temporary grasses and grazings	Slåtter- och betesvall
Type of land	Ägoslag

Uncultivated	Obrukad
Uncultivated field edges	Obrukad fältkant
Undersown with grassland	Insådd av vall

Acknowledgement

This project has been funded by SLU's environmental and monitoring assessment program Agricultural Landscapes through the Faculty of Natural Resources and Agricultural Sciences.

A lot of the information given here is based on experiences from previous studies such as Widén-Nilsson *et al.* (2016). We would like to thank all colleagues that have been involved in these previous data analyses and the discussions.

We would also like to thank the SLU employees who answered the survey that was send out during this project and participated in the workshop where the results were presented. Additionally, we would like to thank Andreas Egbäck from the Swedish Board of Agriculture for his presentation during the workshop, and Dennis Collentine for language checking.

Quick user's guide to block and crop data for agricultural parcels

The following are a series of tips for working with the farmer's block data and the crop information from either agricultural parcel polygon data or agricultural parcel table data:

1. Which year(s) are you interested in?
    a. Agricultural parcel polygon data has good data quality from year 2013.
        i. The agricultural parcel polygon data only have crop codes so the yearly file with translation of crop codes into crop names is also needed.
    b. For year 2012 and earlier, coupling of agricultural parcel table data and block is needed to get the outline on a map. JMP is a useful program.
    c. Up until 2008 the agricultural parcel table data should be matched with the block data for the same year (*e.g.* year 2005 with year 2005).
    d. From year 2009 the agricultural parcel table data should be matched with the block data for the next year (*e.g.* agricultural parcel data for year 2011 with block year 2012). The remaining agricultural parcel table data that do not match block data for the next year should be matched with block data for the same year. The data is representative for the agricultural parcel year.
    e. During 2009 all blocks were checked, and many erroneous blocks removed.
2. Do you need the complete agricultural area from the blocks, or is it enough with the agricultural parcel data? There are about 150 000 ha missing if only the crop areas are considered. This holds both if you use agricultural parcels as polygons and as tables.

3. Do you need polygons with crop information or is it enough with point data? The blockID in the agricultural parcel table can be translated to a RT90 point coordinate. This is especially useful for 2012 and earlier when the agricultural parcel polygons only have a partial coverage.
4. If you need data from several years, remember to consider potential differences in the data format and changes in accuracy, definitions and crop codes.
5. Remember that the data is a snapshot from a dynamic database.
6. Data on actual payments and control data is more accurate than the application data, but has much less spatial coverage. From year 2024 updated agricultural parcel polygons may be used to get more accurate data.
7. Ditches and stone walls may be included at the border of the block and ponds may be included within the block. The outline of the blocks and agricultural parcel polygons may also be about 5 m wrong, *i.e.* including some forest or roads.
8. Be careful when handling data where a specific farmer can be identified and avoid spreading *e.g.* attributes related to reasons for block changes.

More information can be found in this report and its references.

1. Introduction

The Swedish Board of Agriculture ("Jordbruksverket") has detailed national data about applications of agricultural support (subsidies). Some of this data are requested yearly by SLU and made available at the server gis.slu.se. Other data, such as the environmental support for buffer zones and reduced nitrogen leaching are requested when needed. Some employees at SLU work with these data regularly. Others however hesitate to use these data, as they often require GIS competence and because data often differs between different years. Some people are also not aware of the existence of this data.

This project aims to increase the knowledge within SLU about the agricultural support data available and to make it easier to use this data in environmental assessment and research.

This report is mainly a guideline about how to work with farmer's block and crop information in the agricultural parcel data, as well as some environmental support data. It also contains general information about the data, to increase the understanding of how the data can be used and when it cannot.

A survey about the knowledge and usage of the support data from the Swedish Board of Agriculture has been distributed among SLU employees as a part of this project and this report includes the outcome of this survey.

Co-workers within this project have been Elin Widén Nilsson, Kristina Mårtensson and Anders Larsolle. Elin Widén Nilsson has had the main responsibility for writing this report.

1.1 Limitations

This report focuses on farmer's blocks and agricultural parcels. It also contains information about some other agricultural support data, such as data for buffer zones. However, it does not cover all support payments that farmers and others living on the countryside can get.

It is assumed that the reader of this report has some familiarity with the GIS program ArcGIS and the statistical program JMP.

This report describes some of the changes in data and definitions between the years, but it should not be seen as a comprehensive study of the subject. Thus, the reader is encouraged to investigate what changes there are in data and definitions that might influence the result of a specific study, especially if comparisons between years are to be made.

The major part of this report was written from 2022-2023, therefore years after this are not covered.

2. Agricultural support and rural development

A considerable amount of data about the yearly management of Swedish agriculture is generated each year from the farmer economic support system.

Farmers and some others on the countryside in Sweden apply for support within the Rural Development Programme (LBP, "landsbygdsprogrammet"). The programme is financed both by the EU and the Swedish state and is administrated by the Swedish Board of Agriculture ("Jordbruksverket"), the county administration boards, the Swedish Forest Agency, the Swedish Agency for Economic and Regional Growth, and the Sami parliament of Sweden (Jordbruksverket 2022a). In addition, some agricultural support, such as the important farmers' income support ("gårdsstöd" in Swedish) is paid directly by the EU outside of the rural development programme and is thus called direct support.

The EU support is formalised through the common agricultural policy (CAP) support system which is regularly revised (European Commission n.d.-a). Although we have entered the 2023-2027 period most references in this report focus on the 2014-2020 period where the years 2021-2022 were covered by transitional regulations. Earlier program periods were 2000-2006 and 2007-2014. Sweden entered the EU in 1995, during the 1993-1999 period (Jacobson 2011).

The management of agricultural support is called Integrated Administration and Control System (IACS, in Swedish sometimes IAKS for "integrerat administrations- och kontrollsystem"; European commission n.d.-b).

Central for IACS is the land parcel identification system (LPIS). LPIS is a geographical information system for all agricultural areas (reference parcels) in a member state (European Court of Auditors 2016). Different EU countries have different reference parcels; agricultural parcels, cadastral parcels, farmer's blocks or physical/topographical blocks (Table 1).

In Sweden the boundaries of farmer's blocks are the main unit (European Court of Auditors 2016) and they can thus also be called reference parcels, but in this report the term "farmer's block" is used as the Swedish term is "block" or "jordbruksblock". The farmer's blocks may not contain any natural borders such as ditches or roads. A farmer's block can be further divided into agricultural parcels ("jordbruksskifte" or "skifte" in Swedish). An agricultural parcel may only contain one crop, but a farmer's block may contain several crops. If a farmer has more than

one crop within an agricultural parcel he or she is expected to write that in the "other information" section of the application (Länsstyrelsen i Jönköpings län 2018).

Table 1. The four different reference parcel types used in EU member states. Source: Table 1 in European Court of Auditors (2016).

	Agricultural parcel	Cadastral parcel	Farmer's block	Physical / Topographical
Main features	- Single crop group - Single farmer	- One or more farmers - Based on ownership - One or more crop groups	- Single farmer - One or more crop groups - No natural boundaries	- One or more farmers - Area bordered by certain features (ditches, hedges, walls, etc.) - One or more crop groups
Main data source	Farmer's application	Cadastre, land register	Farmer's application	Administrative classification

Every year the farmer needs to apply for support payments for crops and their environmental commitments. The application is called a "SAM-ansökan" ("samordnad ansökan om jordbrukarstöd", i.e. coordinated application of farmer support). It was earlier made mainly on paper but currently all applications have to be made online using the system "SAM Internet", although there are exceptions for a few of the support programs (Table 2). The main change from paper to internet applications was made in 2012 (Jordbruksverket 2011). Applications for support in the SAM application system includes both information on the crop planned for the coming season (or any other agricultural land usage such as buffer zones) and the geographic outline of the grant-eligible agricultural field area. This information is stored in geodatabases as polygons, with attributes describing the identity of the field area and other administrative information for each polygon. The crop information is given in the agricultural parcel database and the other information is given in the farmer's block database.

This report focuses on data about the farmers' income support ("gårdsstöd" in Swedish). It also provides some information about two of the environmental improvement supports ("miljöersättningar"); the one for reducing nitrogen leaching ("minskat kväveläckage") and the one for buffer zones ("skyddszoner"). Farmer support for *e.g.* keeping animals is not covered although it was included in the survey performed as a part of this report (Section 6 below).

The Swedish Board of Agriculture as well as the county administration boards check the applications and perform controls through field visits and inspection of aerial photos. If not all conditions for a support are fulfilled then an amount of support money received by the farmer may be reduced.

The Swedish Board of Agriculture may make changes to a farmer's block anytime during the year. The changes may be 1) the outline of the block, 2) the type of land ("ägoslag") stating whether it is a field for *e.g.* cultivation or grazing, 3) or the category which shows what kind of support the land of the block may be eligible for.

Table 2. The various support that a farmer can apply for in the system SAM Internet (Jordbruksverket 2022d).

Support name in Swedish	Translation
Gårdsstöd	Farmers' income support
Förgröningsstöd	Greening
Nötkreatursstöd	Cattle support
Stöd till unga jordbrukare	Support for young farmers
Miljöersättningar: betesmarker och slåtterängar	Environmental support: Pastures and mown meadows
Miljöersättningar: restaurering av betesmarker och slåtterängar	Environmental support: Restoration of pastures and mown meadows
Miljöersättningar: Fäbodar	Environmental support: Seasonal mountain holding
Miljöersättningar: minskat kväveläckage	Environmental support: Reduced nitrogen leaching
Miljöersättningar: Skyddszoner	Environmental support: Buffer zones
Miljöersättningar: skötsel av våtmarker och dammar	Environmental support: Maintenance of wetlands and dams
Miljöersättningar: Vallodling	Environmental support: Ley farming
Miljöersättningar: hotade husdjursraser	Environmental support: endangered domestic species
Ersättningar för ekologisk produktion och omställning till ekologisk produktion	Support to organic production and organic conversion
Kompensationsstöd	Compensation support
Nationellt stöd för gethållning, smågrisproduktion och potatis-, bär- eller grönsaksodling	National support for goats, production of piglets as well as cultivation of potatoes, berries or vegetables
Djurvälfärdsersättning: extra djuromsorg för får	Animal welfare support: Special care of sheep
Djurvälfärdsersättning: extra djuromsorg för suggor	Animal welfare support: Special care of sows
Djurvälfärdsersättning: utökad klövhälsovård för mjölkkor.	Animal welfare support: Special care of cows

3. Data available at gis.slu.se

Farmers apply for agricultural support in the SAM system in the beginning of the calendar year, and the SAM system is open for corrections and adjustments until June 15. After this date, the SAM application period is closed, and the authorities starts processing the applications. Farmers apply for agricultural support once each year. After this date, the SAM application dataset is requested by the GIS support at SLU, and the datasets are made available in the GIS server at SLU (\\gis.slu.se). This is an arrangement between SLU and the Swedish Board of Agriculture. The data on crops on agricultural fields from the SAM application system is requested once each year from SLU (after June 15), and then made available to SLU employees and students. Requests of data directly from the Swedish Board of Agriculture by individual users at SLU will therefore be referred back to SLU GIS-support.

The dataset normally consists of a farmers' block dataset ("blockdata"), a agricultural parcel dataset ("skiftesdata") in the form of polygons or tables and crop codes ("grödkoder"). Currently, geodata on fields and crops from Swedish farmers' support applications are available from 1998. Please note that the support rules and the application system have been changed several times during this period. There is no standard between years in how the geodata is entered and stored. It is also important to understand that these datasets are not "publishable" products. The datasets are merely snapshots from the current database at the Swedish Board of Agriculture each year. The geodata are not changed, processed or checked by the GIS support at SLU. The datasets will always include errors, mismatches and other problems. In addition, there are no guaranties that the farmer actually will grow the crop specified in the application. The use of the datasets can therefor by tricky, and any analysis should always include error checking. Interpretation of results and conclusions should of course also take this into consideration.

The data is stored on the server \\gis.slu.se\ in the folder GisData and subfolder sjv (for "Statens jordbruksverk"). There are nine folders (Table 3).

The attributes in the stored files may vary between the years, both because of changes in the databases of the Swedish Board of Agriculture and because of variations in files and formats that SLU receives. The attribute names may also be truncated by some programs and that is also the case for some of the attribute names listed here.

A general advice is to be careful with information that provides information about the conditions at a specific farm. Sometimes the attributes may also contain direct citations of text that the farmer has typed in the application. Thus, these datasets should be handled with care and when presenting the data it is advisable to do it in a way that individual farms cannot be identified.

Table 3. The nine different subfolders with data at gis.slu.se\sjv, a very short description of their content and heading number for the data that is further described in this chapter.

Folder	Short description	Described in section below
old_do_not_use	Old deliveries which might contain errors. Some data here has not been re-requested.	-
BlockData	Farmer's blocks (block data, polygons)	3.1
ControlData	Corrected crop areas in the agricultural parcels (table files) and information about the changes of the blocks from one year to the next (table files). Not updated.	3.5.2
CropCodeList	Yearly files with crop codes (small Excel files)	3.4
CropData_decided	Actually paid support data (table files, crop data). Not updated.	3.5.1
CropData_request	Agricultural parcels as table files (crop data)	3.3
Deliveries	Some recent deliveries from the Swedish Board of Agriculture, sorted after date of delivery. Some data have been copied to the corresponding folder (like SJV_Skiften), but not all.	-
Info	Some instructions. This report will be added to the folder.	-
SJV_Skiften	Agricultural parcels as polygons (crop data)	3.2

3.1 Block data

Agricultural land in Sweden is divided into more than 1 million farmer's blocks in total covering more than 3 million ha (Figure 1). In the 2020 file the block size varies between 0.01 ha and 836.46 ha with a median size of 1.05 ha and a mean size of 2.52 ha. The block polygons are available in \sjv\BlockData.

The farmer's block may also be called "reference parcels", but in this report the terms "farmer's block" or "block" are used to distinguish the blocks from the agricultural parcels.

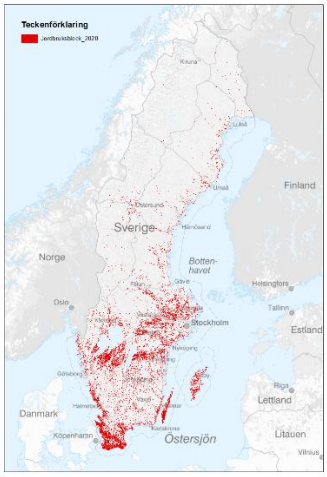

Figure 1. Farmer's block year 2020 in red on top of Lantmäteriet's topographical web map.

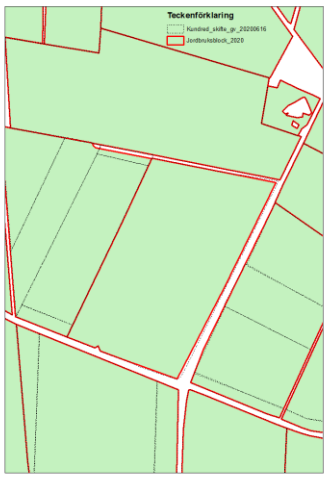

Figure 2. Examples of farmer's blocks for 2020 in green with red outline and agricultural parcel polygons with dashed outline. Some farmer's blocks consist of only one agricultural parcel while others may be divided into several parcels. The outline of the agricultural parcel polygons does not always exactly match the outline of the blocks.

The farmer's blocks are often outlined by e.g. roads, stone walls, houses, ditches and lakes (Jordbruksverket 2022b). Farmer's blocks are also divided by e.g. borders between parishes or support regions (Jordbruksverket 2022b). Thus, farmer's blocks are polygons with various shapes (Figure 2). There may also be holes in the polygons excluding land which are not eligible for agricultural support such as field islets or constructions.

The farmer's blocks were first introduced nationally in 1998, and the first version was based on the economic map (the current "property map") as well as farmers' maps from earlier applications (SOU 1998:147). The reliability of the areal information in the earliest maps is low (SOU 1998:147).

The Swedish Board of Agriculture maintains a database of all blocks which is continuously updated. Updates are made to *e.g.* correct for errors or for changes in the actively used agricultural area. If for example a house has been built, it should be removed from the farmer's block. The farmers are asked to mark such changes when they apply for support in SAM-ansökan. The changes are then made by the Swedish Board of Agriculture. Changes are also made directly by the Swedish Board of Agriculture based on aerial photos, satellite images and field visits. The Swedish Board of agriculture is required to check each block every third year in accord with an EU regulation (Jordbruksverket 2022c). The aim with the control is to ensure that only actively cultivated or grazed areas receive agricultural support. Blocks may not only be changed based on actual changes of the agricultural area or corrections, but also for administrative reasons, such as the division or merging of blocks (Jordbruksverket 2020b). The county board may also update the farmer's blocks (Jordbruksverket 2009a).

Only one farmer is today allowed to apply for support for a specific farmer's block (Jordbruksverket 2020a), but when the system was built several farmers could have agricultural parcels within the same block (SOU 1998:147). It is however noted that double applications still do occur. In 2019 around 1500 of the blocks have two or three farmers applying for support according to the agricultural parcel polygon data, or around 2100 blocks according to the agricultural parcel table data.

Each farmer's block has a unique ID, often called blockID, consisting of 11 numbers. These blockID:s can be transferred to a coordinate in RT90 by a formula (section 3.3.2). It is usually the central coordinate. When a block is changed the blockID is often also changed. The Swedish Board of Agriculture does however currently try to keep the blockID constant if the changes are small. More information about the blockID and the other attributes of the farmer's blocks are given below (section 3.1.3).

The fact that the block database is a dymanic database with continuous updates means that although the file for a specific year should give the best snapshot, other files for that year may have other information. For example, the full farmer's block file with all attributes for 2017 available at gis.slu.se has a total number of 1 262 375 blocks, while the corresponding file for year 2017 available at https://jordbruksverket.se/e-tjanster-databaser-och-appar/e-tjanster-och-databaser-stod/kartor-och-gis only has 1 261 276 blocks. The former file is from 15 March 2017 while the latter is from 23 January 2017. Generally, the block file used for the farmers support applications is set in January each year.

3.1.1 Ditches, stone walls and ponds may be included in the block area

The block border may be placed in the middle of *e.g.* a ditch such that half of the ditch is included in the block. This applies for ditches, stone walls and uncultivated

borders of fields when their width is 2 m or less (Jordbruksverket 2022b). For 2016 and earlier years the maximum allowed width was 4 m (Jordbruksverket 2019). Wider ditches are sometimes erroneously included in the block area (Glimskär *et al.* 2014). Uncertainties in block borders of *e.g.* 6 m may also cause forest, roads and buildings to be included (Glimskär *et al.* 2014).

In some areas even larger uncultivated areas may be included in the block area to protect the environment. This is in those areas with cross-compliance features (tvärvillkorselement; Figure 3). In these areas ponds less than 1000 m^2 may be included, as well as large stand-alone deciduous trees, ditches, stone walls and adjacent uncultivated areas with a maximum width of 10 m (Jordbruksverket 2022e). After 2023 the "tvärvillkorselement" (cross-compliance features) are instead called "grundvillkorselement" ("conditionality") (Jordbruksverket 2022f).

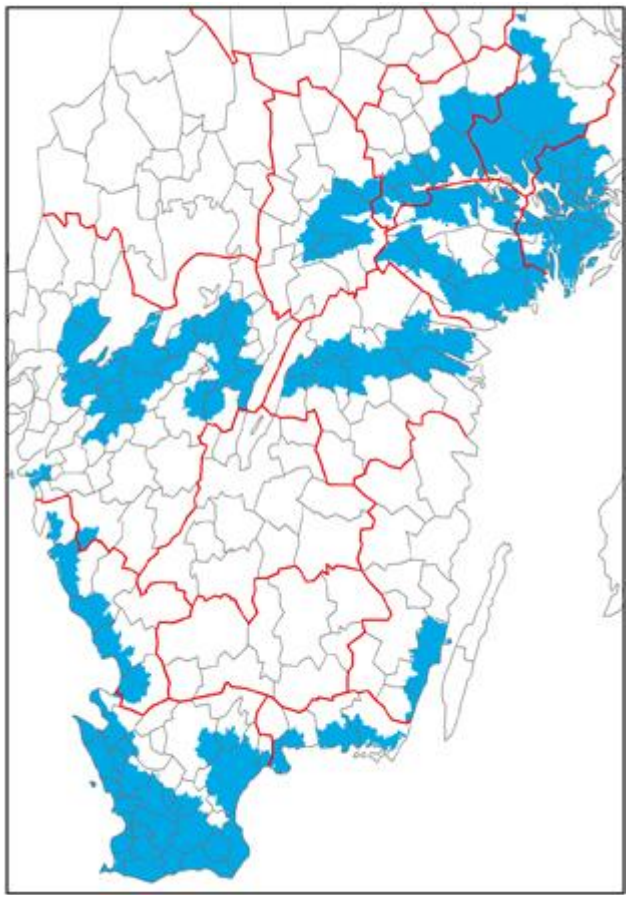

Figure 3. The areas with cross-compliance features (tvärvillkorselement) marked in blue. Source: Jordbruksverket 2022e.

3.1.2 Some major changes

Improvement of the block database in year 2009

During 2009 all blocks were checked, and a lot of erroneous blocks were removed, and some blocks were added. In total there were 30 000 ha of arable land removed and 15 000 ha added, and 21 000 ha of pasture areas removed and 5000 ha added (Svensson 2010). In total 143 000 blocks were removed. Most blocks were checked digitally on the screen but several were also visited in the field. The need for a total inventory of all blocks was caused by higher quality standards as well as revision requests from the EU commission (Jordbruksverket 2009b). One criteria for the removal of blocks was that no-one had applied for support for that block during 2005-2008 (Liljeberg *et al.* 2013).

From 2010 the block file represents the previous year

After the large update in 2009 a new routine was established for the updating of the block file and the year it represents. The block file is continuously updated during the year to take changes into account. The updated file is then used as the starting point for the support applications the next year. Thus the crop information in the agricultural parcel data should be matched with the block file of the next year from 2009 and after (*e.g.* agricultural parcel table data for year 2011 with block year 2012). But for earlier years the agricultural parcel table files should be matched with the block file of the same year (*e.g.* agricultural parcel table data for year 2005 with block year 2005). More information is given in section 3.6.

Changed coordinate system

The block files from 2015 use the coordinate system SWEREF 99 TM but previous years have the coordinate system RT90. The blockID is still a RT90 code. The change from RT90 to SWEREF 99 TM caused a reduced size of the total block area as well as the area of individual blocks.

Changed definition of pasture areas

The estimate of the total pasture area in Sweden changes between the years due to varying definitions. This does also affect the number and form of pasture blocks. More information is given in section 3.7.1.

Table 4. Example of the attribute Type of land (Ägoslag) for year 2020, 2015 and 2013 together with the total number of blocks for each alternative each year, and a column with translation. The name of the alternatives and the total number of alternatives have varied.

2020, AGOSLAG	2020, N blocks	2015, AGOSLAG_TE	2015, N blocks	2013, Agoslag	2013, N blocks	Translation, Type of land
BETE	284 801	Bete	270 407	Bete	278 325	Pasture
OKÄNT	23 574	Okänt	28 839	Okänt	35 158	Unknown
VÅTMARK	4 499	Våtmark	3 604	Våtmark	3 157	Wetland
AKER	828 117	Åker	583 544	Åker	926 994	Arable land
AKER_PERMGRAS	140 113	Åkermark – långliggande vall	351 729			Arable land (permanent ley/grass-land)
AKER_PERMGROD	5 641	Åkermark – permanenta grödor	3 982			Arable land (permanent crops)
ÖVRM	1 230			Övrig mark	152	Other land
Total	1 287 975		1 242 522		1 243 786	

Table 5. Attributes related to checks and corrections of the blocks in year 2015 and 2016 for one example block.

Attribute 2015	Attribute 2016	Example block 2015	Example block 2016	Explanation
-	**GRANSK_AV**		PSOG	Person who has checked the block
-	**GRANSK_DAT**		2015-02-27	Date of checking
-	**GRMETOD**		Skärm	Method of checking (here ”screen”)
GRANSKOR_1	**GRORSAK**	Riskanalys	Riskanalys	Reason for checking
INVENTER_1	-	2012-12-11		Date of checking
INVENTERAT	-	XJBRA		Person who has checked the block
INVMETOD_T	-	Skärm		Method of checking (here ”screen”)
-	**KOM_SAMI**		20141210 Ändrat ägoslag till åkermark med permanent gräs-mark.	Comment about changes made (here changing type of land) and when they were made (here 10 Dec. 2014).
KONTROLLAR	**KONTROLLAR**	2008	2008	Year of checking (not the same as the date of checking above)
-	**NOTERING**		Blocket granskat, ingen åtgärd.	Comments about checks and changes also comments from farmers.
ORTOFOTOAR	**ORTOFOTOAR**	2012	2012	Year of aerial photo.
REDIGERAT1	**RED_AV**	RROSE	RROSE	Person who has edited the block.
REDIGERA_1	**RED_DATUM**	2012-04-25	2012-04-25	Date edited.
REDIGERAT_	**RED_KONTR**	J	J	Yes (J), No (N) or empty
BLOCKSTA_1	**STATUS**	Klart	Klart	Status (here ”finished”)

3.1.3 Block data attributes

Farmer's blocks made available at the website of the Swedish Board of Agriculture (https://jordbruksverket.se/e-tjanster-databaser-och-appar/e-tjanster-och-databaser-stod/kartor-och-gis) may have fewer attributes than farmer's blocks requested directly by the SLU GIS support from the Swedish Board of Agriculture.

BLOCKID

The **blockID**, 11 digits, is the unique identifier for the block. In earlier block files it is often called **HEL_ID** instead. In addition, for farmer's blocks for some years there might also be an attribute **BLOCKIDTXT** or **GEOGRAFISK** which seems to contain the blockID.

The blockID may be changed between the years if the outline of the block is changed.

AGOSLAG

Ägoslag (in GIS spelled **Agoslag**) is a farmer's block attribute stating the type of land, mainly if it is arable land or pasture. The alternatives for this attribute have varied over the years (Table 4). In the earlier files this attribute is missing. The attribute name may also be **AGOSLAG_TE** (probably truncated from AGOSLAG_TEXT).

Permanent ley/grassland on arable land (AKER_PERMGRAS) are blocks that have had ley or fallow for at least five years (Jordbruksverket 2021a). A block is still permanent grassland if it is ploughed and resown with ley, but if the farmer gets environmental support for the ley the block cannot be included in greening support (Jordbruksverket 2021a).

Permanent crops on arable land (AKER_PERMGROD) includes six crop codes; 65 (salix), 67 ("poppel" – poplar), 68 (hybridasp – hybrid aspen), 71 ("övrig bärodling" – cultivation of other berries), 72 ("fruktodling" – orchard) and 78 ("plantskolor med odling av permanenta grödor" – plant nurseries with cultivation of permanent crops) (Jordbruksverket 2021a).

KATEGORI

Kategori (category) is a farmer's block attribute with information about the support category for the block. The main alternative is Farm/Environment (Gård/Miljö), with more than 1 million blocks (Table 6). The second most common alternative is Ineligible (Ej stödberättigande). For some years, such as 2020, the category is delivered as numbers instead of text, without translation.

The attribute name is usually **KATEGORI** but it may also be **KATEGORI_T** (probably trunkated from KATEGORI_TEXT). In the farmer's block files delivered to SLU, the KATEGORI attribute has been included since 2010.

The category Gård/Miljö means that the blocks are eligible for both farmers' income support and environmental support, while the category Miljö means that the blocks are only eligible for environmental support.

The category Ej stödberättigande is set for farmers' blocks where no one has applied for support during the last three years. It is also set for blocks which in the yearly update are not considered eligible in their current state. The ineligible blocks are not included in the yearly revision of the blocks. If a farmer applies for support for an ineligible block it will be reviewed to determine if it can be changed into an eligible block.

Table 6. Example of the attribute Category for year 2020, 2017 and 2010. The alternatives were given as numbers in year 2020 and 2010. The combination (translation) of numbers and describing text in this table have been assumed based on the number of blocks for each alternative.

2020, KATEGORI	2020, N blocks	2017, KATEGORI	2017, N blocks	2010, KATEGORI	2010, N blocks	Translation, Category
0	13 560	Miljö	12 783	0	25 937	Environment
				1	634	
2	1 077 555	Gård/Miljö	1 096 050	2	1 088 275	Farm/Environment
3	99	Okänt	33	3	35 702	Unknown
4	196 310	Ej stödberättigande	152 843			Ineligible
5	451	Miljöinvesteringar	666			Non-productive environmental investments
				<no data>	36 876	
Total	1 287 975		1 262 375		1 187 424	

REGION

REGION is a number with 7 digits (e.g. 0880130), where the first two digits are a code for the county (län), the second two for the municipality (kommun) and following two for the parish (församling) and the last for part of the parish (0 if no division). The codes for the municipalities and parishes are not nationally unique but have to be combined with the county code as well as the municipality code (for the parishes). The codes refer to 1999 the parish division, as well as the municipalities from 1999.

The attribute name may also be **REGION_KOD**. There may also be separate attributes **FORSAMLING** (parish code), **KOMMUN** or **KOMMUNKOD** (municipality code) and **LAN** or **LANSKOD** (county code).

AREAL and OMKRETS

AREAL is a farmer's block attribute giving the farmer's block area in hectares, often with 2 decimals. This area may differ slightly from the **Shape_Area** calculated in ArcGIS.

The farmer's block file in 2015 also have the attribute **Arealswe** with the area in SWEREF 99 TM, while the AREAL was still in RT90. From 2016 the AREAL attribute seems to be in SWEREF 99 TM.

Other area related attributes:

- There may also be an attribute **EJ_SBAREAL**, which is 0 for most blocks but with a few exceptions is the block area for the ineligible blocks.
- Some years also have the attribute **MAXAVV** which is 0 for most blocks, but then varies between 0.01 and 400.00 for other blocks. The highest values are almost equal to the block area in hectares and are mainly set for some of the ineligible blocks. MAXAVV may be an abbreviation of "max avvikelse", i.e. maximum deviation but no explanation is given.

OMKRETS is a farmer's block attribute giving the perimeter in meters, sometimes with no decimals and sometimes with several. The perimeter may differ slightly from the **Shape_Length** calculated in ArcGIS.

Attributes about checks and corrections of the blocks

In the farmer's block database there are several attributes which provide information about recent checks and corrections of the blocks, but SLU does not always receive this information. These attribute names can for example be **GRANSK_DAT**, **KONTROLLAR** and **RED_DATUM**.

The attributes related to checks and corrections for 2015 and 2016 are given for an example block in Table 5. Blocks from earlier years have the attributes **DATUM** (date) and **GJORDAV** (made by).

Sometimes these attributes contain direct citations of text that the farmer has typed in the application or reasons for block changes that represent specific conditions at the farm. Thus, these attributes should be handled with extra care. If you do not need them, you can remove them from the data you are working with.

3.1.4 Practical tips: How to work with the farmer's blocks

The farmer's blocks have been delivered as shape files. For quicker handling it is practical to save them in a geodatabase.

Current farmer's blocks are delivered in the coordinate system SWEREF 99 TM but until 2014 the coordinate system RT90 was used. The change from RT90 to SWEREF 99 TM caused a reduced size of the total block area as well as the area of individual blocks. The area change for individual blocks were usually 0,01 ha (Jordbruksverket 2015). If you work with older blocks you would probably want to

convert them to SWEREF 99 TM. The block file for 1998 is missing coordinate information and is thus not drawn correctly. The Swedish Board of Agriculture only provides farmer's block files from 2003 and onwards on their website[1], which might be an indication that the years 1999–2002 might be uncertain.

Bordering farmer's blocks may overlap somewhat. These topology errors are usually small, only one or a few mm width and with an area of less than 1 m^2. There might however occur larger errors as well (Table 7). To avoid problems in the future GIS work, one might want to correct for these errors. Widén-Nilsson *et al.* (2016) correct the topology errors for 2013 by assigning the overlapping area to either of the two blocks in an automated routine. Larger overlaps are manually corrected. Widén-Nilsson *et al.* (2019) use a higher tolerance, 0.5 m, instead of the standard tolerance 0.001 m. It gives fewer errors, but the form of the blocks area also changed, and thus it might be better to use the finer tolerance.

Table 7. Size distribution of the overlaps between the farmer's blocks of year 2014 with the standard tolerance level 0.001 m.

Area of overlap	Number of blocks
> 100 m^2	2
10 m^2 to 100 m^2	95
1 m^2 to 10 m^2	1315
< 1 m^2	28 158
Total	29 570

Since there are more than 1.2 million farmer's blocks, the dbf file with the attributes cannot be correctly handled in Excel but should be opened in e.g. JMP instead.

Most years the blocks are delivered in one file, but some years they may be delivered as separate files for each county.

Although most farmer's blocks are very detailed, there are a few very large blocks in the county of Dalarna which are drawn as circles or rectangles, covering various land covers. These are blocks of pasture or unknown type. They are either connected to seasonal mountain holdings ("fäbodbete") or are blocks where no one has applied for support. The corresponding agricultural parcels may also be very large.

Ten of the farmer's blocks are situated in Finland and not in Sweden. They are all located on the island Niittysaari in the Torne river. Niittysaari and a few other islands in the border rivers between Sweden and Finland are so called "suveränitetsholmar" (sovereign islets) meaning that they have a special status. These islands belong to one country, but are used by inhabitants of the other country.

[1] https://jordbruksverket.se/e-tjanster-databaser-och-appar/e-tjanster-och-databaser-stod/kartor-och-gis

3.2 Agricultural parcels as polygons

Each block is divided into one or several agricultural parcels and there are GIS files for the agricultural parcels just like the block files. They are made available in the folder \sjv\SJV_Skiften These polygons are taken from the online application forms where the farmer specifies which crop they will grow on each parcel. From 2013 almost all farmers have used the online application and the agricultural parcel polygon files have good national coverage. The crop application data is also available as table files, which are described in section 3.3, and these are recommended to be used for 2012 and earlier instead of the agricultural parcel polygons.

3.2.1 Uncultivated field edges may be included in the parcel area

As a part of the greening support, a farmer may have uncultivated field edges ("obrukad fältkant"). These are 1 – 20 meters wide and are only specified with their length in the SAM-ansökan and not their width (Jordbruksverket 2021a). In the calculation of the ecological focus area the length of the uncultivated field edge is multiplied by a factor 9, independent of the actual width. In the agricultural parcels where there is an uncultivated field edge, the farmer applies for support for the main crop for the whole parcel. Therefore, the stated area of crops may be somewhat larger than the actual area. Information about the length of the uncultivated field edges is not included in the agricultural parcel data files, the polygons, or the tables, that SLU receives from the Swedish Board of Agriculture.

Greening support became a part of CAP between 2015 and 2022. The Swedish Board of Agriculture estimates the area of uncultivated field edges for each year and this has varied between 700 ha and more than 8200 ha between 2015 and 2021 (Jordbruksverket 2022g and 2022h). In 2021 the area is estimated to be 6700 ha, with *e.g.* 3900 ha from a selection of cereal crops, 620 ha oilseed and 518 ha temporary grasses and grazings (Jordbruksverket 2022g and 2022h).

3.2.2 Agricultural parcel polygon data attributes

BlockID

The blockID is usually called **SAMIBLOCK_** in the parcel polygon data attribute tables. In the file for 2022 it is called **sami_blockid**. This is the same blockID that is used in the block data files and the agricultural parcel table files, but time lags in the updates of the different files cause some differences (see more information in section 3.6 and 3.7). The blockID in the agricultural parcel file with application data represents the blockID at the time of application, *i.e.* February to mid April.

The agricultural parcel polygon files have acceptable national coverage after 2012. To work with the older files with less coverage, it should be noted that in the 2001 file, the blockID with the attribute name **GEOGRAFISK**, in some parcels may have 12 or 13 digits instead of the normal 11 digits.

There can be several parcels within one farmer's block, *i.e.* the blockID is not unique for the parcels.

SKIFTESBET and skiftesbeteckning

SKIFTESBET and **skiftesbeteckning** is the local identification of the agricultural parcel. It consists of the parcel number ("skiftesnummer") and the parcel letter ("skiftesbokstav"). The number can be up to 3 digits long, and the letter may be a combination of up to 3 letters. Within a farm the identification must be unique, *i.e.* the identification only occurs once for each farmer. Of all the agricultural parcels the most common value is 1A, followed by 2A.

Farmer code

Each farmer is identified with the county letter ("länsbokstav") and a number, which together form the **kundnummer (**customer number). Kundnummer is the attribute name in the 2022 file. In other files the **KUND_LAN** and the number **KUND_LOPNR** are separate attributes. The county letter is based on the 1996 county division with 24 counties, *i.e.* letters L, P and R are still used. The farmer code is not included in all parcel files, and when it is included, the information must be handled with extra care to avoid identification of individual farms when your study is presented.

Crop codes

In the application, the farmer specifies which crop he or she will grow on the different parcels. The crop is one of around 100 different crops, having a unique crop code. The crop code attribute is named **MYGRODKOD** in earlier files, then later **GRDKOD_MAR** and in the 2022 file **grodkod_markanvandning**. The translation between crop codes and crops may vary somewhat between the years. More information about the crop codes is given in section 3.4.

The crop code may be missing from some agricultural parcel polygons. In 2013 this is the case for 5028 parcels, while in 2019 all parcels have a code.

For some crops, such as green fodder, there is also a sub-crop code given which further specifies which crop is grown. The sub-crop code is called **GRDKOD_UND** and in the file for 2022 **grodkod_under**.

Area and perimeter

In the application, the farmer specifies which crop he or she will grow on the different agricultural parcels. The area of the crops is given in hectares with 2

decimals. In the agricultural parcel polygon file, this area is named **AREAL_SKIF** and in the file for 2022 **ansokt_areal**.

The actual area of the parcel polygon, in hectares, is given in the attribute **AREAL**. Recalculated to m^2 it is almost equal to the **SHAPE_AREA**.

The attribute **OMKRETS** gives the perimeter of the parcel in meter. It is equal to the **SHAPE_LEN(TH)**.

Ecological Focus Areas (EFA)

Some agricultural parcel polygons have information on Ecological Focus Areas in the attribute **EFATYPE** or **efatyp**. The Ecological Focus areas are part of the greening support. In the parcel polygon file for 2020 there are four different EFATYPE values (Table 8). The EFATYPE values fallow and salix, for the example year 2020 only occur together with crop code 60 and 65 respectively, but not for all parcels with these crop codes.

Table 8. The attribute EFATYPE (type of Ecological Focus Areas) for the parcel data file 2020.

EFATYPE	Number of parcels	Translation
Kvävefixerade grödor	2 244	Nitrogen fixating crops
Salix	644	Salix
Skiften med insådd av vall	9 473	Parcels undersown with grassland
Träda	40 776	Fallow
-	1 158 395	-
Total	1 211 532	

SPECMAINT

The attribute **SPECMAINT** seems to be a newer attribute. In the agricultural parcel polygon file for 2020 it is 0 for most parcels, but 1 for some of the parcels having crop code 52, 53, 54, 56, 89 and 90, *i.e.* most of the pasture crop types. The further meaning of this attribute has not been checked.

Other ID:s

Apart from the ID:s mentioned above (SAMIBLOCK_/GEOGRAFISK, SKIFTESBET/skiftesbeteckning) there are several other ID:s in the parcel files. These attributes do however seem to change between the years. These attributes are **SAMISKIFTE**, **OBJECTID**, **ID** and in the 2022 file **samiskifteid, sami_kundred_block_id, sami_kundred_ansokan_id, sami_blockid, organisationid** and **addid**.

Other attributes

The 2022 file has three additional attributes: **lager** (layer) , **nysokt_atagande** (new commitment) and **version**. The layer attribute is 2022 for all blocks.

3.2.3 Practical tips: How to work with the agricultural parcel polygons

At \sjv\SJV_Skiften are polygon files available from 2001 and after, but data for the first few years have very limited coverage. From 2013 the national coverage with a few exceptions is acceptable since almost all farmers completed their applications online and not with paper forms. Before 2012 the agricultural parcel table data should be used instead of the polygons to get information about the crops. The Swedish Board of Agriculture only provides agricultural parcel polygon files from 2015 and after on their website[2], suggesting that also the years 2013–2014 should be handled with care.

The agricultural parcel polygons are delivered as zipped shape files up until year 2021, and as a geopackage from year 2022. The geopackage files are too large to be correctly handled in ArcMap and should be opened in ArcGIS Pro instead.[3]

While the blocks have a coordinate system change between 2014 and 2015, the agricultural parcel polygon files are always given in SWEREF99.

Other tips given above about the farmers' block data are also valid for the agricultural parcel polygons: shape files are quicker handled when saved in a geodatabase; the dbf files from the polygons cannot be correctly handled in Excel but should be opened in *e.g.* JMP; there are overlaps (topology errors) in the files. Although a block consists of one or more agricultural parcels the parcel and the block files of a specific year do not match each other fully. More information about this is given in section 3.6

It should also be noted that the agricultural parcel polygon files and the agricultural parcel table data for the same year do not match each other fully. One explanation is that they are excerpts from the database at different dates. A comparison between the parcel polygon file and the parcel table file for year 2019 shows that the total area is about the same in both files, but there are 52 000 ha in the table file (16 699 parcels) that do not match the same blockID and crop in the polygon file and 54 000 ha (18 757 parcels) in the polygon file that do not match the blockID and crop in the table file. In addition, there are 8 355 parcels where the blockID and crop matches, but the crop area differs.

3.3 Agricultural parcels as tables

Each block is divided into one or several agricultural parcels. In the earlier years of the support system, no spatial information was available on the actual position of

[2] https://jordbruksverket.se/e-tjanster-databaser-och-appar/e-tjanster-och-databaser-stod/kartor-och-gis

[3] It is also not possible to export the parcel data from ArcGIS Pro to a shape file or geodatabase that can be opened in ArcMap due to the format big integer of the attribute Objectid. At least this is the case for the 2023 parcels.

the agricultural parcels, but the crop application data is given in a txt or csv table file. In some sections of this report the agricultural parcel table data are called "crop table data" instead. For many years SLU has received agricultural parcel data both as tables and as polygons.

Data for 2005-2019 are available in \sjv\CropData_request. Many of the files are called brukare_skifte_20xx.txt, but there are also csv files and files with other names. Older data for 2001-2004 are available in \sjv_old_do_not_use\CropData, but a new data request is recommended if these data are needed since some of the data in this folder might be wrong.

Some data for year 1995-2000 is found in the folder \sjv\deliveries\2020-07-03\stoddata but its attributes and its reliability has not been investigated.

3.3.1 Agricultural parcel table data attributes

The agricultural parcel table files from 2005 to 2018 available through the GIS-server have 6 to 9 columns. The 2019 data have 11 columns and it is divided into two files.

Especially in older files there can be some parcels with clearly erroneous attributes, such as a missing blockID.

BLOCKID

The blockID is called **Blockid**, **BLOCKID**, **Block Id** or **SAMIBLOCK_**. This is the same blockID that is used in the block data files and the agricultural parcel polygon data files. Just like the latter, the blockID is valid for the time of application, *i.e.* February to mid-April. Similarly, there can be several rows for each blockID.

In the file for 2005 there are 39 parcels where the blockID is only 1 or 10 digits long, instead of the correct 11 digits.

Ordningsnummer and Skiftesbokstav besk or SKIFTESBET

The agricultural parcel table files from 2010 and onwards contain information on the local parcel identification, which is the same as in the polygon file. In some files it is written in one single column (**SKIFTESBET**) but in most files the number and letter is divided in two different columns, **Ordningsnummer** and **Skiftesbokstav besk**. The 2019 file has only Ordningsnummer without the letter.

The 2005 file also contain some parcel information, but with a letter only (with a few exceptions). This column is missing a header and thus this and the following columns erroneously get the header of the column to the right. One simple way to solve this is to add a header between "Kundnr nr" and "Grödkod" in the text file before importing it to e.g. JMP.

Although the Skiftesbokstav is one to three letters, this column may also contain the text "Skifte saknas" or "Skiftesbokstav felaktig", meaning that there is no parcel

or that the parcel letter is erroneous. When this is the case, there is also no crop or crop area specified.

Farmer code

The agricultural parcel table data often contain a code for the farmer, just like the polygon file. It consists of the county letter code ("länsbokstav", not the same as the numeric county code in the block attribute) and a number.

In the many files the attribute name is **Kundnr** (customer number) and the whole code with letter and number is written. In other files the county letter and the number are divided between two columns, called **IDNRALFA** and **IDNRNUMERISK**, **Kundnr län** and **Kundnr nr**, or **KUND_LAN** and **KUND_LOPNR**.

Although there is a code for the farmer and not a personal name or a company name it is recommended to handle this information with care to avoid identification of individual farms when your study is presented.

Crop code and name

The farmer can apply for support for about 100 different crops, each having a unique code. The crop code attribute is in the agricultural parcel table files called **Grödkod** (2005), **GRODKOD** (2006-2009), **Markanvändning kod** (2010-2016, 2019) and **GRDKOD_MAR** (2017-2018). In several files is also the translation to the crop name given in the column **GRODBESKRIVNING**. It may also be called **Beskrivning markanvändning**, **Grodbes** or **Markanvändning**. When the translation is missing, a separate file with the crop codes is needed. The translation between crop codes and crops vary somewhat between the years. More information about the crop codes is given in section 3.4.

The crop code may be "-1" with the translation "Värde saknas" (Value missing) and no specified area. In 2010 this occur for more than 35 000 parcels. There may also be a translation missing for a few crop codes. In year 2005 this is the case for 14 parcels having the crop code 51, 73 or 75. The crop code may also be 99 with the translation "Gröda saknas" (Crop missing). The corresponding area to this crop code is often 0, but it may also contain an actual area.

The 2018 file also have subcrop information with the attribute **GRDKOD_UND**.

Area

The area of the crop in the application is given in hectares with two decimals in the column **AREAL**, **Anmäld Skiftesareal, Skiftesareal** or **AREAL_SKIF**. It is similar to the parcel polygon files where the name usually is AREAL_SKIF.

The area may be 0, which is the case for more than 21 000 parcels in the 2005 file, or empty when the crop code is -1. In the 2011 file there is a parcel with a

negative area. A few parcels may have a larger applied area than 500 ha. These are all pastures, mainly “Alvarbete (Öland, Gotland)” and “Fäbodbete som ej berättigar till gårdsstöd”, *i.e.* pastures on the alvar of Öland and Gotland and seasonal mountain holdings.

Like the parcel polygon files, there may be an uncultivated field edge within the parcel with unknown area.

Other ID:s

The 2017 file also contains the attribute **SAMISKIFTE** which is found in some of the polygon data files as well.

Other attributes

Just like the blocks, some agricultural parcel tables may have the attribute **Ägoslag** or **Beskrivning Ägoslag** stating the type of land.

Several files have a column with the year. It is usually called **Ärende År** but 2005 it is called **Stödår**.

The attribute **Ärendetyp** or **Ärendetyp kod** is given in some files. Year 2010 the value is “SAM-ansökan” for all parcels, and year 2014 it is “GÅRD” for all parcels.

The 2017 file have information on Ecological Focus Areas (EFATYPE). The four categories are the same as for the agricultural parcel polygon file 2020 used as an example for the EFATYPE above.

The 2019 have three additional attributes. **Handläggande län** (handling county) and **Nivå 1** (level 1) is the letter code of the county and the name of the county where the County Administrative Board is handling the support application. The majority of the farms have their application handled at the County Administrative Board corresponding to the county code of the farm, but there are exceptions in every county. **Brukningscentrum JA/NEJ** means center of the farming and says ”Ja” or ”Nej”, *i.e.* Yes or No. For the majority of the farmer code it is Yes for one of the parcels and No for the rest. 5410 farms have two parcels with Yes and some other farms have up to ten Yes parcels.

3.3.2 Translation of blockID to a point

The blockID:s are constructed from a RT90 2,5 gon V coordinate within the block. It is often the centre point, but especially in newer files it can also be a point somewhere else within the block. The blockID can be transferred back to the RT90 coordinate.

The 11-digit long blockID ABCDEFGHIJK can be transferred back to a RT90 2,5 gon V coordinate according to this system:

ABCD*EFG***HI***JK*

North = **ABCDHI**0, *i.e.* position 1-4 + position 8-9 + 0

East = 1*EFGJK*0, *i.e.* 1 + position 5-7 + position 10-11 + 0

Or with formulas:

x = floor (blockID / 10000000)

y = floor ((blockID - x*10000000)/10000) + 1000

z = floor (blockID / 100) – floor(blockID / 10000) * 100

a = blockID – floor (blockID / 100) * 100

North = x*1000 + z*10

East = y*1000 + a*10

Example blockID 64403722635:

North = 6440260

East = 1372350

3.3.3 Practical tips: How to work with the agricultural parcel table data

The files are in txt or csv format. Even if some are in csv format, they should not be opened in Excel, but in *e.g.* JMP instead. There are more rows in the files than Excel can handle.

The file format varies. Some are *e.g.* delimited with semi colon while others are delimited with comma or tabs. In the 2005 file there is an additional parcel letter after the farmer code. It is however not included in the header and thus the rows with data one column are longer than the header. It also varies if the area of the parcel area is written with a decimal comma or with a decimal point. If the area is less than 1 ha it also varies if the 0 is written or not, i.e. 0.28 or .28 (or 0,28 compared to ,28). The 2019 file is divided into two parts.

Especially in older files there may be some blocks or agricultural parcels with clearly erroneous attributes, such as a wrong blockID.

As noted in section 3.2.3 there is no exact match between the agricultural parcel table file and the parcel polygons for a specific year. Neither is there a perfect match between the blockID:s of the parcel table file and the block data. Routines for coupling the parcel table data to the blocks are described in section 3.6.

3.4 Crop codes

The farmer can apply for support for about 100 different crops, and some can also be specified with sub-crops. As an example, the crop codes, including the sub-codes, in 2022 are listed in Appendix A.

The translation of the crop code into the name of the crop is available in all agricultural parcel table files except 2017 and 2018. It is however missing in the agricultural parcel polygon files. The Swedish Board of Agriculture produces a crop code list (grödkodlista) every year and it can be used to translate the crop code to the crop. Currently the crop code lists for the years 2018, 2019, 2020 and 2023 are available at the server in the folder \sjv\CropCodeList. These are small Excel files. The folder should be updated to give information for each year with agricultural parcel polygon data.

3.4.1 Practical tips: How to work with the crop codes

Instead of handling 100 different crops the crops are often grouped based on the focus of the study. Different examples of how the crop codes may be grouped are given in section 7.

Some crop codes change between the years. Before reusing a key translating crop codes to different groups, or applying a key on agricultural parcel data for several years, it is thus important to check if there have been any changes in the crop codes. There can be major changes, where the translation from code to crop changes totally for a code (section 3.7), but there are also minor changes in the crop names between the years.

There may be minor differences between the crop code list and the name of the crop given in the agricultural parcel table file for a specific year. One example is that a minor crop with a few hectares in the application are missing in the crop code list. Another example is that the exact name of a crop may differ slightly since abbreviations are used in one of the files or that an older name is used in one of the files.

3.5 Actually paid support, control data and block changes

3.5.1 Actually paid support data

In section 3.3 above, the table data with crop applications for each agricultural parcel is described. There are also table files with information about what actually is paid out as support available in the folder \sjv\CropData_decided. It is however, important to know that these files have less coverage than the application data. For

year 2013 the actually paid out support data covers 270 000 ha less than the application data (Widén-Nilsson *et al.* 2016). The reason for this difference is that farmers use a larger area for cultivation and grazing than they have support rights ("stödrättigheter") for. They are obligated to apply for support for the full area, but will only get support for the area which has support rights. Thus, it is usually better to use the crop areas from the application, *i.e.* the agricultural parcel polygons or the agricultural parcel tables. In the statistics about usage of the agricultural areas in Sweden the applications are the main data source (Jordbruksverket 2022i).

After 2022 the support rights have not longer been used. It is not known if this will make the actually paid support data a better data source than the application data. However, due to the new routines from 2024 with yearly satellite-based controls of the crop codes on all agricultural land it is assumed that the agricultural parcel data will be improved compared to the application agricultural parcel data. Thus, the need for the actually paid support data should be minor.

In the folder \sjv\CropData_decided tables for years 2001 to 2014 are available. The format is rather similar to the parcel table data. The blockID represents the blockID at the time of decision, meaning that changes after the application should be included.

3.5.2 Control data and yearly block changes

The folder \sjv\ControlData contains two types of files for year 2006-2013. The folder is named after the control data which contain information of corrected crop areas in the agricultural parcels. In addition, there are files named overlay_20xx which contain information on the changes of the blocks from one year to the next.

Controlled agricultural parcel data

The compressed files that have the word "kontroll" in their file name, contain information if an agricultural parcel (table data) has been given a changed crop area after control. The corrections are made during the summer and autumn based on information from the farmer or various types of controls. The controls may be performed with field visits, but may also be due to the fact that the application is made for a larger area than the actual block area.

The important attributes are

- "Referensareal": "Reference area" meaning the official block area. If there are several parcels in a block, they all get the same reference area.
- "Anmäld Skiftesareal": "Application parcel area", i.e. the area of a specific crop in the agricultural parcel (if there are several parcels with the same crop in a block they are aggregated to one row)
- "Fastställd areal i kontroll": "Determined area after control" is the new, area after the control. It may be the same as before the control.

In addition, the files contain the blockID, the crop code and crop name (“Markanvändning kod“ and “Markanvändning“) as well as the type of land (“Ägoslag“). Most files also contain a year column (“Ärende År“), case type (“Ärendetyp kod“), and application type (“Ansökantyp kod“). The case type is always the farmers’ income support (“gårdsstöd”) since these controls are rarely made for the environmental improvement support (“miljöersättning”) blocks. In addition, only blocks that have been controlled are included in these files. Thus, they must be used together with the application crop data for agricultural parcels to get the full information. And as noted above the new routines with yearly satellite-based controls of the crop codes on all agricultural land will give a more correct information of the actual sizes and crops from year 2024.

Block changes

The compressed files named ”Overlay_YYYY…” give information about the block changes that have been made each year. The folder contains files for year 2006, 2007, 2009, 2011 and 2012. (There is also a 2013 file, but it is corrupt.)

The latter files have seven columns (YEAR, BLOCKID, NY_BLOCKID, REGANSV, REGDAT, UPPANSV, UPPDAT) but the last two are always empty. Depending on what change has been made the other columns have information:

- If there only is an area change in the block, the file has information in all five columns, and the blockID is the same in both columns BLOCKID and NY_BLOCKID.
- If a block has been divided it has also information in all five columns, and there is one row for each of the new blockID:s which are given in the column NY_BLOCKID. The old blockID is given in the column BLOCKID.
- If a block is new, the new blockID is written in both the BLOCKID and the NY_BLOCKID column, while the following columns are empty.
- If a block is removed the text “BORTTAGET” (removed) is written in the column NY_BLOCKID.

The earlier files have more columns, but no column header. Each row seems to contain one or several blockID:s.

3.6 Practical work in coupling of block and agricultural parcel data

The agricultural parcel table data is in this section mainly called “crop table data”.

3.6.1 Which years to couple

If you want to utilise the polygon information about the outline of the field together with the crop information in the agricultural parcel table data, you need to couple these to each other. Depending on which year(s) you want to work with, the methods may differ.

From year 2009 the agricultural parcel table data should be matched with the farmers' block data for the next year (*e.g.* crop data for year 2011 with block year 2012). The remaining agricultural parcel table data that do not match block data for the next year should be matched with block data for the same year. The data is representative for the agricultural parcel year.

For the years around this break the following matching should be used:

- crop table data for year 2008 with block data for year 2008
- crop table data for year 2009 with block data for year 2010 and in a second step the blocks from 2009 for blockID:s in the crop table data that do not match the 2010 blocks
- crop table data for year 2010 with block data for year 2011 and in a second step the from 2010 for blockID:s in the crop table data that do not match the 2011 blocks.

If you work with data from 2013 or later, you can use the agricultural parcel polygons directly and add the block file if you want to also cover the blocks without support applications. This area varies between years, but it is approximately 150 000 ha.

3.6.2 Example of coupling of crops and blocks when blocks are divided by other borders, such as sub-catchments

On common task is to calculate the crop distribution within hydrological sub-catchments. Here follows an example on how this can be made on the national scale with crop table data from 2013[4] and the farmer's blocks of 2014 and 2013 (as in Widén-Nilsson *et al.* 2016). In this example JMP and ArcGIS are used. You can modify this routine based on the data and the needs in your project. Text in *italics* is used for columns which are used in equations.

Start in JMP to prepare information needed to combine the 2014 and 2013 block files:

1) Decide which unit you want to use for the areas. In the following, you will use both Shape_Area from ArcGIS, which usually is [m^2] and crop application areas which are given in [ha]. Depending on scale, you might

[4] In this example the agricultural parcel table data for 2013 are used, although it probably would have been acceptable to use the agricultural parcel polygon data instead.

want to use [km^2]. When relating areas to each other, they need to have the same unit. The following steps does not indicate when you need recalculate an area column to get the data in your chosen unit.

2) Group the 2013 crop table file on blockID and calculate the sum of the crop area application in each block (*SumApplicationInTheBlock*).
3) Join the 2014 farmers' block file with the file from 1) using the blockID.
4) Add a column to the file from 3) telling if the farmers' block have a support application or not (this is needed for the later combination of the 2014 and 2013 farmers' blocks).
    a. You may also want to add information if there is a match between the blockID of the block and the crop file, but there is no actual area of the applied crop. For the 2013 file this occurs when all parcels with the same blockID in the crop table file have crop code -1 "Värde saknas" (value missing) and no area specified. Widén-Nilsson *et al.* (2016) considered these blocks as having a support application.
5) Extract the blockID:s from 4) where the blockID from the crops do not match the 2014 blocks.
6) Join the 2013 farmers' block file with the file from 5).
7) Extract the blockID:s from 6) where the remaining 2013 crops do match the 2013 blocks.

Continue in ArcGIS to do the actual combination of the 2014 and 2013 block files: (In this section you also add the sub-catchment borders.)

8) Join the 2014 farmers' block file with the information from file 4), i.e. if the block have a support application or not.
9) Join the 2013 farmers' block file with the file from 7) to only get the selection of 2013 polygons that should be added to the 2014 file in a later step.
10) Make a selection of the 2014 farmer's block that have their centroid within the polygons from 9). The centroid method is good, but not perfect. It misses for example crescent shaped blocks and blocks with holes in the centroid (Widén-Nilsson *et al.* 2016).
11) From the selection in 10), select the blocks that do not have any support application.
12) Remove the 2014 blocks that were selected in 11).
13) Make an "erase" of the 2013 blocks from 9) with the blocks from 12) such that the parts of the 2013 blocks that are overlapped by a 2014 block with support application are removed.
14) Merge the remaining 2014 blocks from 12) and the non-overlapping parts of the 2013 blocks from 13). You do now have a block file with a majority of 2014 blocks, but where some 2013 blocks are added. The 2014 blocks have been given higher priority since they have not been removed if they have a

support application and overlapping parts of the 2013 that should be added have been removed.

   a. Note that this file may have multi-polygons since the 2013 blocks may have been cut in parts.

15) Make an intersect between your sub-catchment file and the merged block file from 14). Export the corresponding table.

Continue in JMP to do the actual calculations on the crop area in each sub-catchment:

16) Open the table file from 15). Group the file on blockID and subcatchment ID and calculate the sum of its Shape_Area. This gives information about the partial block area in each sub-catchment (*BlockPartialArea*).
   a. The grouping is needed since the block may be divided into several parts in the sub-catchment and may then be distributed on several rows.
17) Join the file from 16) with information about the total block area from each block (*TotalBlockArea)* using the blockID. The total block area can either be taken from the corresponding table from 14) or by taking the sum of the block area for each block in 16). In either case, remember to use the updated Shape_Area, and not the rounded block area attribute.
18) In the 17) file, calculate the share of each block in the subcatchments, by *BlockPartialArea* / *TotalBlockArea* = *BlockShareOfTheWholeBlock* (remember that the areas need to have the same unit).
19) Open the 2013 crop table file again. The original information about the crop area in the application is called *CropApplication*.
   a. You might also want to join the information about the sum of the crop area application (*SumApplicationInTheBlock*) from 1) using the blockID.
20) If you want the crop codes to be grouped into fewer crops, which are easier to handle, you can add the translation key between the crop codes and your crop groups at this stage, i.e. you join the translation to the file from 19) using the crop code.
21) Join the block file from 18) with the crop file from 20) using the blockID. Thus the same block information is repeated on several rows if there are two or more crop applications within the same block.
22) Although some 2013 blocks have been added there will be some rows in 21) from the crop application file that do not match any block. Remove these rows.
   a. In this example it is 703 rows with crops and belonging to 520 unique blockID:s that are removed.

b. If you instead want to keep this application data, you can make circular polygons with the area of *SumApplicationInTheBlock* around the coordinate point that corresponds to the blockID (as in section 3.3.2) of these non-matching application blocks. This should preferably be made after step 14).

23) In the file from 22), remove the column with blockID originating from the crop application file, since this column will have empty spaces where the blocks do not match the crops, *i.e.* where the blocks does not have any support application. Instead, continue to use the blockID

24) In the file from 23), calculate *BlockShareOfTheWholeBlock* * *CropApplication* = *CorrectedCropArea*. Now you have downscaled the crop area to the share of the block that is in the subcatchment. In the following steps you will do corrections based on if the crop area in the application is larger or smaller than the block area.

25) Group the file from 24) on blockID and subcatchment ID and calculate the sum of the *CorrectedCropArea*, called *SumOfCorrectedCropArea.*

26) Join the information from 25), *SumOfCorrectedCropArea*, to the file from 24) using both the blockID and the subcatchment ID.

27) Calculate the weighted crop area *ShareOfCrops = BlockPartialArea / SumOfCorrectedCropArea* (remember that the areas need to have the same unit).

a. If *ShareOfCrops* from 27) is larger than 1, it means that the block area is larger than the total crop application in that block. According to the routines by Widén-Nilsson *et al.* (2016) this additional block area will be set to a crop named "undefined". This cannot be made here but is made at the last step. If *ShareOfCrops* is smaller than 1, the crop area will be downscaled.

28) Calculate in the file from 27)

$$FinalCropArea = \begin{cases} CorrectedCropArea, & ShareOfCrops > 1 \\ ShareOfCrops * CorrectedCropArea, & ShareOfCrops \leq 1 \end{cases}$$

29) Group the file from 28) on the subcatchment ID and the crop (original crop code or name if you have not added any translation key in 20), otherwise the crop group name) and sum *FinalCropArea.*

30) Transpose the file from 29) to get the subcatchments on the rows, and the crops in the columns. In JMP this is made by transposing the column *Sum(FinalCropArea)* with the crop as "label" and with "by" as the catchmentID.

31) Search and replace all empty values in 30) with 0. The empty values are crops that do not occur in a specific subcatchment.

32) Now is it possible to calculate the area of the "undefined crop" as the block area with no crop application. Begin by opening the file from 16) and group it on catchment ID and sum the *BlockPartialArea*.
33) Join the transposed file from 31) with the file 32) using the subcatchment ID to get the total block area in each subcatchment.
34) Calculate *AreaApplication* in the file 33) by summing all crop columns.
35) Calculate *UndefinedCropArea = Sum(BlockPartialArea) – AreaApplication*

3.6.3 Special mismatches between the block and the parcel data

As noted above, the total block area is around 150 000 ha larger than the total crop application area. In addition, there are also crop applications where the blockID does not match the current blockID but have to be matched to the year before instead. Still, there are some crop applications that do not match any block. In addition to the mismatches due to the blockID, there are some other differences that might be good to know about.

The largest mismatch in areal size between the blocks and the parcel crop applications occurs for seasonal mountain holdings. Here the routine in some counties is that the farmer applies for environmental support for a very large area while the corresponding block is only the small part that is eligible for farmers' income support. The large and diffuse area which is eligible for environmental support is not drawn in the block map but is administrated through the crop application code 55 which is "Fäbodbete ej stödberättigat".

In general, the block attribute Ägoslag, specifying the type of land fits well with the crop application made for the block. However, there are examples of arable land blocks with pasture applications and vice versa.

3.7 Comparison of data between different years

The data can be used for comparison between different years but one has to be careful as definitions may vary between the years.

A practical problem is that the blockID may change between the years if changes have been made to the block. The Swedish Board of Agriculture during recent years has tried to keep the same blockID if smaller changes are made to a farmer's block, but there are still many blocks that are changed during a year in a way that requires a new blockID. For example, comparing the block files for year 2019 and 2020, about 30 000 blocks in each file do not match the blocks in the other file. As there are around 1 300 000 blocks it means that around 2,5 % are removed or changed such that a new blockID was generated between the two years.

As shown above, the data format in the data SLU receives and the attributes may change between the years.

It is also important to remember that the block database is constantly updated by the Swedish Board of Agriculture. The data that SLU receives can be seen as snapshots from the database and although the intention is to cover most of the data for a specific year, there may be differences between the years depending on the timing when the data is requested.

Other things to consider is that definitions and regulations may vary between years. One simple example is that the crop codes may vary slightly. The crop code 62 was earlier "viltbete" (grazing of game animals) but is currently "klöverfrövall" (clover seed farming). "Viltbete" is not used as a crop anymore. Another example is the crop code 66 which was "rörflen" (reed canary grass) in year 2000 but since year 2011 is adapted buffer zones ("anpassade skyddszoner"). "Rörflen" is instead crop code 63 which nowadays area called "energigräs" (biofuel grass).

Larger changes in regulations may occur in the beginning of a new CAP (common agricultural policy) period.

When changes between years are studied, it is, as always, important to check if there are any changed routines that may falsely influence the interpretation of the results.

3.7.1 Changes in the pasture areas

The pasture areas have more uncertainties than the arable areas. There have been several changes in the pasture block areas during the years, which do not reflect the actual changes in the pasture areas. The pasture areas increased in Sweden 1995 due to the EU membership and again 2005 when the farmers' income support ("gårdsstöd") was introduced. (Jacobson 2011). The increase in 2005 was caused by the fact that the farmers were encouraged to include all their land in the applications (Jacobson 2011). On the other hand, farmers may also remove pasture areas from the support system because of the complicated rules (Hasund 2016). In 2008 a limit on the maximum number of trees per hectare in pasture areas was introduced to fulfil requirements from the EU commission (Jakobsson *et al.* 2021). This definition change reduced the pasture areas by 30 000 ha (Jordbruksverket 2010). A change in 2009 aimed to clarify what types of pasture areas were eligible for support and in addition, the eligible landscape elements in the pasture areas were specified (Jakobsson *et al.* 2021). In the agricultural statistics there is a change in pasture areas in 2010 due to a change in the definition of which agricultural holdings should be included in the registry of agricultural holdings (LBR, Lantbruksregistret) (Jordbruksverket 2022i).

Between 2014 and 2015 the definition of pasture areas was changed to simplify the work for farmers and authorities (Jakobsson *et al.* 2021). A comparison between the pasture blocks from 2014 and 2019 gives that the pasture blocks in 2019 have

fewer holes since small areas with low grazing quality such as impediments may be included with the new definitions (Jakobsson *et al.* 2021). At the same time, 30 percent of the mapped semi-natural grassland habitats under the EU habitat directive are not included in the block database (Jakobsson *et al.* 2021).

The pasture areas in 2000 seem to be connected with extra uncertainties (Hansson *et al.* 2020). Information about pasture areas is also likely affected more than arable areas because farms with a small arable area and few animals are not included in the support system. More information about agricultural areas outside of the block database is given in section 5.

Due to varying interpretations of which area should be reported for seasonal mountain holdings (fädbodbeten) comparisons between years of seasonal mountain holdings should be made with care (Jordbruksverket and SCB 2005).

4. Other data from the Swedish Board of Agriculture

An example of other data that could be of interest is data about area of catch crops, spring tillage and buffer zones. Catch crops, spring tillage and buffer zones were subsidised within the Rural Development programme for the period of 2014-2020 (and 2021-2022). Catch crop and spring tillage can be subsidised both together and separately. The database with the area of catch crops and spring tillage includes the support year, support, county, municipality, parish, production region, land use (crop), specification of mitigation measure ("odlingsgrupp"), agricultural parcel number ("skifte"), and area eligible for subsidies. It is possible to calculate the area of each mitigation measure per crop. Data about catch crop and spring tillage needs to be requested from the Swedish Board of Agriculture.

It is also possible to find the beneficiaries of financial support from the European Agricultural Guarantee Fund (EAGF) and the European Agricultural Fund for Rural Development (EAFRD), The European Maritime and Fisheries Fund (EMFF) 2014-2020, The Maritime, Fisheries and Aquaculture Programme (EMFAF) 2021-2027, European Regional Development Fund and European Social Fund within community led local development (ERDF and ESF) 2014-2020. The receipt of support is documented in the database and document management. What additional information is listed depends on the fund financing the support.

5. Agricultural areas not included in the block database

The agricultural parcel database covers the agricultural area where farmers have applied for support. While some agricultural parcels may not be inside a block, there are many blocks where a farmer has not applied for support. The latter group is approximately 150 000 ha, but varies between years. Blocks where no one has applied for support during the last three years is assigned the attribute ”ej stödberättigande” (ineligible), and may eventually be removed. The ineligible blocks are left out from the yearly update to save resources. In reality they may either be blocks which are still cultivated or grazed but for which no one applies for support or blocks where cultivation or grazing is no longer taking place.

There are also some agricultural areas outside of the block database. It may e.g. be small farms and horse owners that are not applying for support for their fields and pastures. It may also be abandoned agricultural areas that have not yet been covered with bushes and trees. In an investigation in the municipality of Härryda interpretations of ortophotos gave 24 % more potential agricultural land than the block map of year 2019 (Naturcentrum 2020). There is however only a small area that is actively farmed and where the farmer is not applying for support. In a study in Skåne by Raderschall *et al.* (2021) crop information was missing in IACS for 6.2 percent of the studied arable area and had to be identified in the field.

In the agricultural statistics around 11 000 ha are added as “unspecified arable land” and around 5000 ha as “unspecified pasture areas” where the farmers do not apply for support (Jordbruksverket 2021b). This “unspecified” arable land was 85 % temporary grasses and grazings (“slåtter- och betesvall“ in Swedish) and 10 % fallow according to a 2013 survey. The rest of this arable land was cultivated with among others cereals, rape and horticulture plants (Jordbruksverket 2021b). With the results from this survey the Swedish Board of Agriculture distributed around 50 % of the unspecified arable land among different crops for the years 2013–2015. But for earlier and later years all land where the farmers have not applied for support is counted as unspecified arable land. Thus, the area of unspecified arable land in the statistics is not comparable between all years (Jordbruksverket 2021b). “Unspecified arable land” was introduced in 2000 (Jordbruksverket 2022i). For year 2022 the area where farmers have not applied for support is taken from surveys

sent out to all farms and recorded in the registry of agricultural holdings (LBR, Lantbruksregistret) sent out 2020 (Jordbruksverket 2022i).

As noted in section 3.7.1, the definition of which farms should be included in the registry of agricultural holdings (LBR) has been changed. The current definitions include farms which on one specific day in June fulfil at last one of the following criteria (Jordbruksverket 2022i):

- cultivates more than 2,0 ha arable land;
- cultivates or has grazings in total on at least 5,0 ha agricultural land;
- performs commercial horticulture on at least 2500 m^2 open area;
- performs commercial horticulture in at least 200 m^2 greenhouse area;
- has animals including at least 10 cattle, or at least 10 sows, or at least 50 pigs, or at least 20 sheep and lamb, or at least 1000 poultry birds (including chickens).

Palmgren (2010) compares four different estimates of semi-natural pastures in Sweden. These four are; the block database for year 2007 together with information on pasture "crops", the TUVA database (with results from the national survey of semi-natural pastures and meadows), the Swedish National Forest Inventory and NILS (National Inventories of Landscapes in Sweden). The latter two are sample inventories and have higher estimates of semi-natural pastures and 30 % of the semi-natural pastures that are not registered in either TUVA or the block database (Palmgren 2010).

6. Survey about usage of support data from the Swedish Board of Agriculture

A survey was sent out to staff at SLU working with agricultural land, asking them about their experience of working with support data from the Swedish Board of Agriculture. The survey was available in both Swedish and English.

The agricultural parcel table data is in this section called “crop table data”. More information about the survey itself is given in Appendix B.

6.1 Results

The first question was “Have you used support data from the Swedish Board of Agriculture?”. It was answered by 44 respondents. Of these, the majority (25 respondents, 57 %) answered no, 17 respondents answered yes and 2 that they did not know (Figure 4). One additional person finished the survey without answering this question, making the total numbers of responses 45.

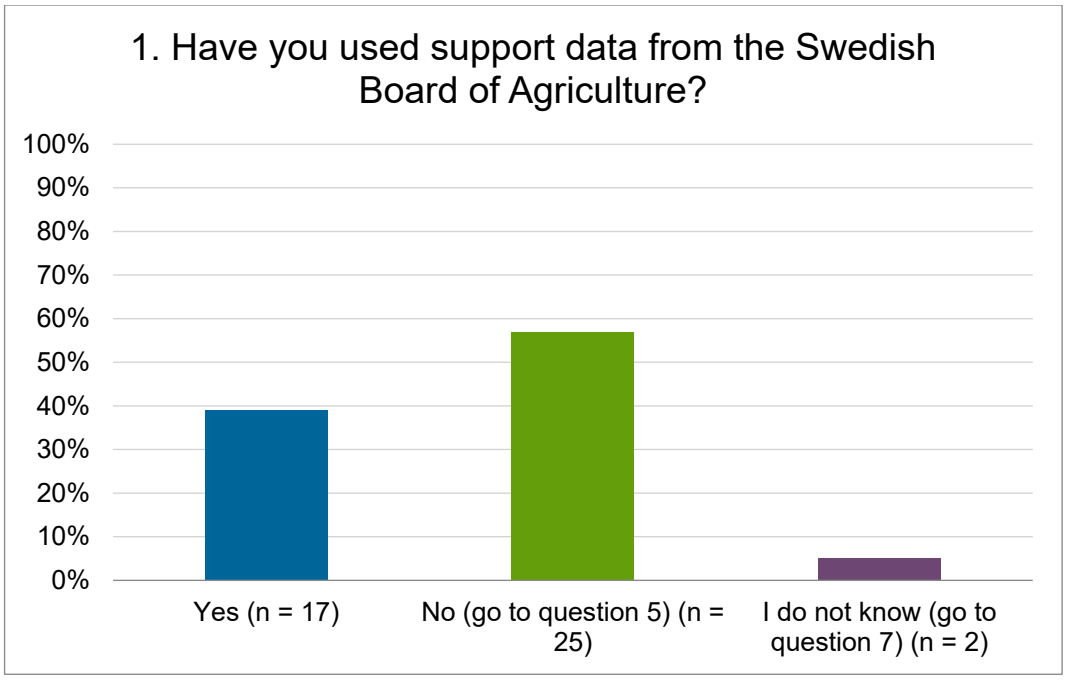

Figure 4. The 44 answers to the first question in the survey.

6.1.1 Answers from the persons having used the data.

The majority of the persons answering this question have used data about "Farmers' income support and greening (e.g. block maps, agricultural parcel and crop data, payment entitlements)" (Figure 5). Some have also worked with "Environmental support (cultivated grasslands, catch crops and spring tillage, buffer strips, seasonal mountain holdings), wetlands and drainage as well as pastures or mown meadows". It was possible to select several alternatives in response to this question. In total 19 respondentss answered this question, although only 17 answered "yes" on the first question if they have used the data.

Two of the four respondents answered that they have used other data, specified as the TUVA database (National Meadow and Pasture Inventory) and one specified the database about the production animal sites' geographical position. The fourth person specified data belong to the first category with block and parcel map data.

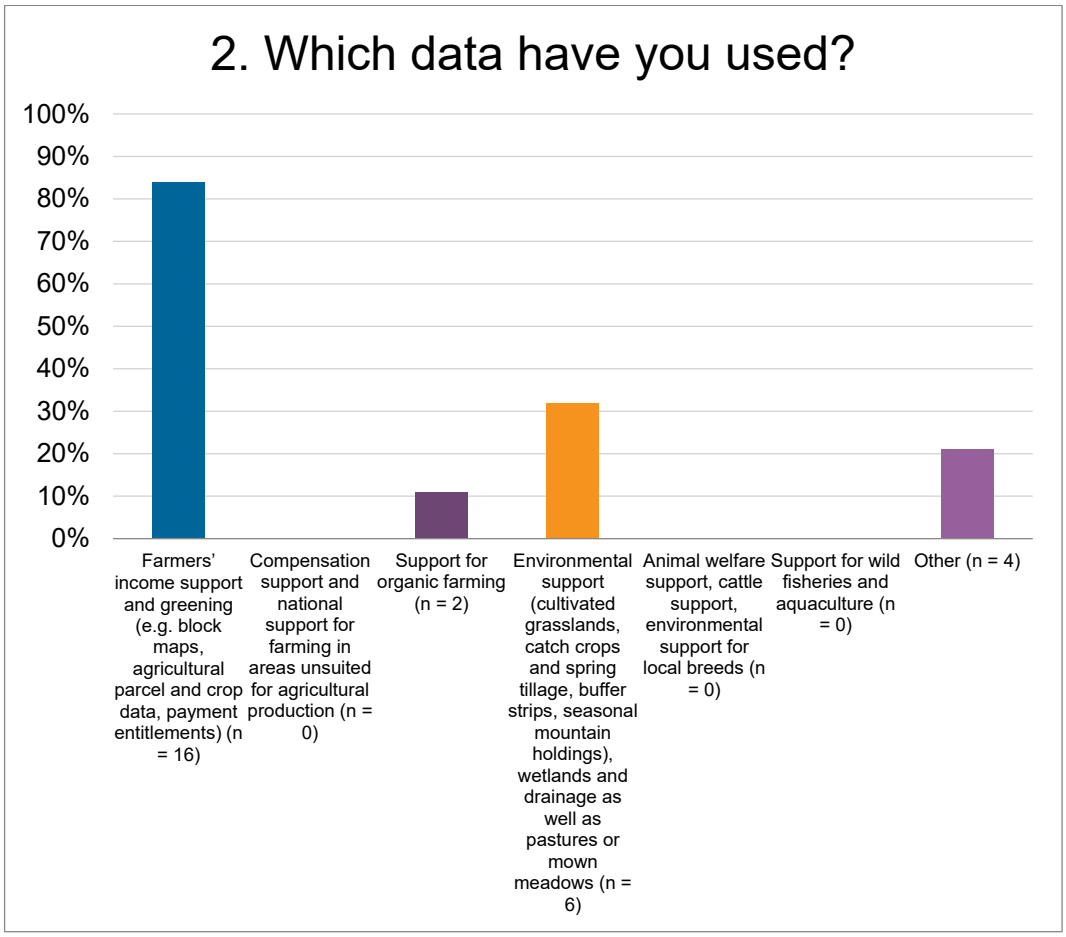

Figure 5. Answers from 19 persons about which data they have used. It was possible to select several alternatives.

The respondents answering that they have used data were also asked the follow-up question “What possibilities and obstacles have you experienced when you have used or tried to access these data?” and 11 answered.

The following possibilities were listed:

- Good spatial resolution (1 person) and to get a detailed land usage map (2 people)
- Very useful data
- A lot of information when coupling crop table files about the parcels with the block files.
- Very useful as a complement to studies in farmer’s field to also get information about pervious crop sequences and what has been cultivated in the surrounding field to get an idea about the landscape and crop diversity in space and time.
- Very useful for landscape ecological analysis coupling the type of support with biodiversity.
- Very useful data for modelling the risk of pesticide leaching where the usage can be coupled to a specific field or a specific crop.
- I have recommended this data to a group of master students who needed vegetation data in specific catchments

And the following obstacles were listed:

- Hard to find (4 people). One mentions especially older block data. One says that it is hard to find on the web page, but it is better now.
- Different format and content between the years (1 person) and no consequent naming of the files (1 person).
- A challenge that the parcels change a lot or somewhat each year, but since it is the reality, it is probably hard to improve
- Unclear if it is data from the application or final corrected data from after the growing season is finished (1 person) and not clear if application or decided data should be used (1 person)
- That the polygons have overlaps (2 people) which must be handled with the topology function in ArcMap. One mentions that this should be clarified because now there is a risk that the user starts working without a topology correction and gets erroneous areas.
- Sometimes the position of the parcel within the block is not known, but I think that has changed now (1 person). It would have been easier to get parcel data which is directly coupled to the shape file with parcel data in the attributes instead of separate table data in Excel files (1 person).
- Sometimes late access to the data
- Just like all data it is not always uncomplicated.

The survey also had a question about references to their work with this data. Examples of usage of this data at SLU is given in section 7.

6.1.2 Answers from the persons who have not used the data

The majority of the 25 respondents answering the question about why they have not used the support data from the Swedish Board of Agriculture said it was because they were not aware of the data (Figure 6). Several did also not know how to access the data. Five said that they had no use of the data. Four stated other reasons.

Interestingly, no one said that they did not use the data because it was too complicated.

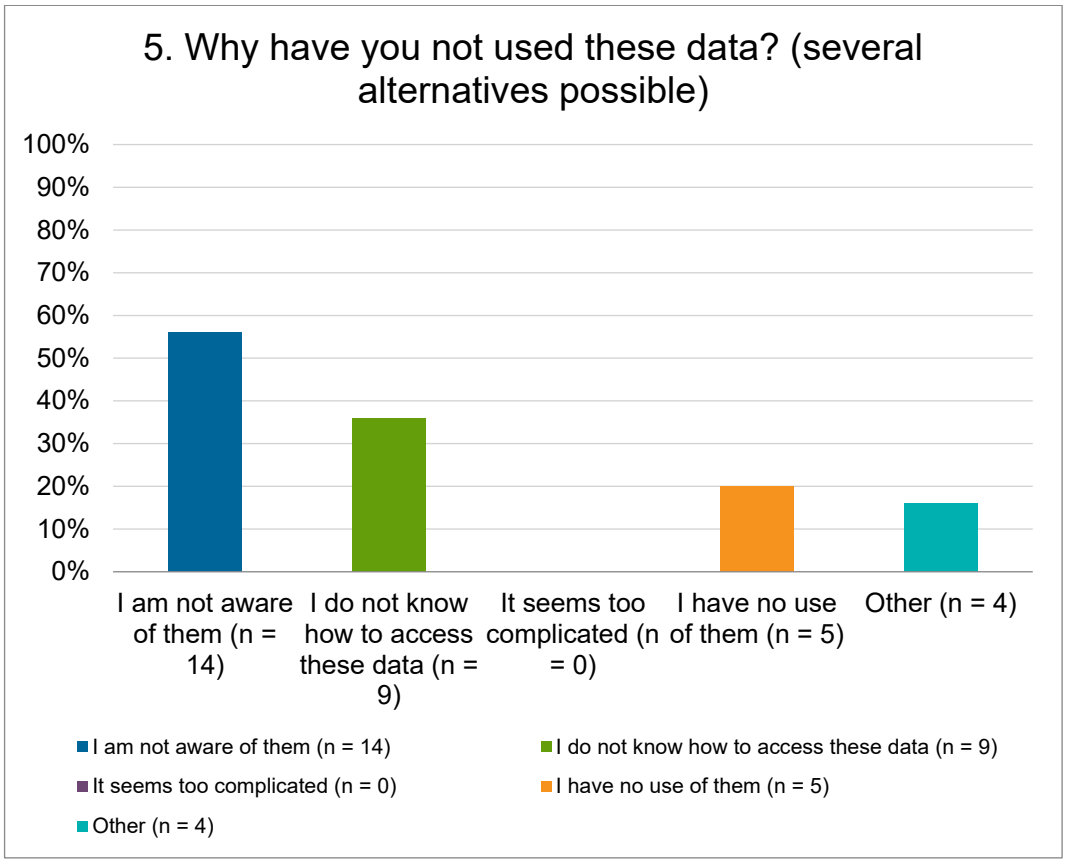

Figure 6. Answers from 25 about why they have not used the support data from the Swedish Board of Agriculture. It was possible to select several alternatives.

The respondents were asked to comment on why they have not used the data: "Please comment on your answer to 5. (Is there for example, something special that seems complicated and keeps you from using the data?)". The question was answered by 8 people. The following answers were given:

- I was not aware of these data
- I work with other things or landscapes (2 people)
- We do our own studies and work with physiological properties
- I'm aware of the data but it has not been relevant for my project
- I haven't needed the data for my research so far, but it will be interesting to learn more about it

- I'm used to find data at Lantmäteriet and different geodata sites. I've also visited the open data page of the Swedish Board of Agriculture but the file I downloaded could not be opened. I gave up since I did not know what was in the file.
- I do not trust data from the Swedish Board of Agriculture

6.1.3 Answers from the persons not knowing if they have used the support data or not

Two respondents answered that they do not know if they have used the data and one commented on the answer that he/she had used statistical compilations by the Swedish Board of Agriculture but did not know if it should be seen as support data or not.

6.2 Reflections on the answers

Of the people answering the survey, 17 to 19 had used agricultural support data from the Swedish Board of Agriculture. The majority of these had used the block and agricultural parcel data. Since these data were the focus of this report it might have influenced how we constructed the survey and thus the answers. On the other hand, the block and agricultural parcel data are useful in many applications, and they may be needed as a complement when working with other support data since a lot of data is connected to the blockID. Some have also used data about environmental support, wetlands, drainage, pastures or mown meadows. A few have used organic farming support data or the TUVA database, and one has used data about the position of production animal sites. Of the 11 people answering the open question about possibilities and obstacles in using the data, 7 of these answered that it is very useful data or that they recommend the data to others.

A major obstacle seems to be how to find the data. Of the people using the data four mention it and of the people not using the data nine answered that they do not know how to access the data. At least two respondents have specified that they have looked for data at the web page of the Swedish Board of Agriculture. Thus, not everyone is aware that the block, and agricultural parcel and table data about crops are made available at the GIS server of SLU.

The main reason for not using the data is however that the respondents were not aware of the data. Maybe this is because they do not need them, but others would probably gain on reflecting if the data would be useful.

When constructing the survey, we assumed that several people would avoid using the data because it seemed too complicated for them. However, there was no one who answered that this was a reason for not using the data. For the users of the data the second most important obstacle, after the first which was how to find the

data, was that the data changes between years, including format, content and naming of the files as well as actual changes in the outline of the block and agricultural parcels between the years. Other obstacles were uncertainties about application data and final corrected data, overlapping polygons, how to couple the crop information for the agricultural parcels with the blocks and late access to the data.

One person not using the data responded that he/she does not trust the data from the Swedish Board of Agriculture. We assume that this person works with projects that need other data than that which is the focus of this report.

7. Examples of data usage

As already noted, the support data from the Swedish Board of Agriculture is useful in many studies. Here we present examples of studies where employees at SLU have used these data. The examples are based on the references provided by the respondents of the survey, our own work with the support data and other studies that we were aware of.

We have grouped the studies into six categories based on the purpose of the studies. Some studies might however fit into several categories.

7.1 Nutrient load and nutrient leaching

7.1.1 Crop distribution within catchments

The crop distribution in each catchment in Sweden is calculated for the calculation of the sources of nitrogen and phosphorous to the Baltic Sea for the Pollution Load Compilation to Helcom and follow-up of the Swedish environmental goal "no eutrophication". The crop distribution for sub-catchments for years 2005, 2009, 2011, 2013 and 2016 is calculated by coupling block data and agricultural parcel table data and grouping the crop codes into about 15 different crop types (Brandt et al. 2009; Ejhed *et al.* 2011 and 2014; Widén-Nilsson *et al.* 2016 and 2019). Special routines are used to handle the crop and block data that do not match each other. In the most recent calculation (Widén-Nilsson *et al.* 2023), the agricultural parcel polygon data for year 2019 is used instead of the table data, but the addition of blocks without agricultural parcel data is still made. As a preparation for the 2013 calculation Liljeberg *et al.* (2013) compares the block and agricultural parcel data areas for 2005, 2009 and 2011 with a special focus on the blocks without corresponding agricultural parcel table data. Liljeberg *et al.* (2013) and Widén-Nilsson *et al.* (2016) also contain comparisons between the block and agricultural parcel data and the compilations by Statistics Sweden. The calculations for year 2005, 2009 and 2011 also contain comparisons with the years 1995 and 2000 (Ejhed *et al.* 2014). The crops for the earlier years are based on Lantbruksregistret (LBR) instead of the IACS data which was first introduced in the year 2000. The LBR data has to be recalculated to be comparable with the IACS data (Ejhed *et al*. 2007), but there are still differences that must be considered (Hansson *et al.* 2020).

7.1.2 Input data for nutrient leaching calculations (environmental support; block and parcel sizes)

When calculating the leaching of nitrogen and phosphorus from agricultural land for the Pollution Load Compilations and other applications, statistics about Swedish agriculture made by Statistics Sweden, but often based on support data from the Swedish Board of Agriculture, are input data (Johnsson *et al.* 2022). Data on catch crops and spring tillage from the environmental subsidies for reduced nitrogen leaching and as well as environmental subsidy data on buffer zones are requested directly from the Swedish Board of Agriculture. The block polygons are also used to get information about the median field size (Johnsson *et al.* 2022). In the most recent calculation, the size of the buffer zones' agricultural parcel polygons are also used (Johnsson *et al.* 2023; Widén-Nilsson *et al.* 2023).

7.1.3 Trends analysis and evaluation of measures

Fölster *et al.* (2012) report trends in nitrogen and phosphorus concentration and loads in 65 agricultural streams and couple this to time series in crop data and agricultural support data in the catchments. Block and agricultural parcel table data from 2001-2010 are used as well as agricultural support data for the blocks about ecological farming, environmental protection, reduced nitrogen leaching, buffer zones and wetlands.

Djodjic *et al.* (2020) evaluate the cost effectiveness of nutrient retention in constructed wetlands. The wetland block polygons are used as one source to find the constructed wetlands in the study area. Since the wetland block polygons usually cover a larger area than the water surface of the wetland, which is needed for the study, the polygons are updated based on the wetland database of SMHI or Google Earth. Geranmayeh *et al.* (2023) study the effectiveness of constructed wetlands financed by the Rural Development Programme and compare wetlands constructed in 2007-2013 and 2014-2020 for biodiversity purposes with those constructed for nutrient retention purposes. The data on the constructed wetlands is obtained from the Swedish Board of Agriculture.

7.2 Effect on biodiversity from crop distribution, agri-environmental payments (support) and other factors

To study the effect of the surrounding crop diversity on pollinators in 14 faba bean fields in southern Sweden in year 2017, Raderschall *et al.* (2021) use the IACS block and agricultural parcel table data for information on the percentage of each crop within 1.5 km distance from these fields. Crop areas for blocks that are only

partly within the 1.5 km buffer are calculated by multiplying the crop area from the table data with the proportion of the block that is inside the buffer. Notably, 6.2 % of the arable land in the study was missing crop information in IACS and was identified in the field (Raderschall *et al.* 2021).

Hiron *et al.* (2012, 2013a, 2013b, 2015) study the diversity of birds in farmland and use information on *e.g.* crop distribution, length and size of the fields, the proportion of land not covered by agricultural land around the study sites to relate the species richness to surrounding factors. They also use data on different agri-environmental payments (Hiron *et al.* 2013b). Josefsson *et al.* (2017) study bird communities and their sensitivity to crop diversification in Swedish farmland and use data on mean field size, crops, proportion of arable land around the studied farms and if the farms are conventional or organic. The crops are grouped into 8 structural classes. Two crop diversity indexes are calculated.

To study if there is a positive effect on vascular plants and pollinators from agri-environmental schemes Berg *et al.* (2019) use the TUVA database (National Meadow and Pasture Inventory) and data about different environmental support for pastures during an 11-year period.

7.3 Crop diversity

In studies on functional crop diversity on Swedish farms Nilsson *et al.* (2022) and Shaak *et al.* (2023) use block and agricultural parcel table data from 2001 to 2018 for nearly all farms in Sweden. Nine functional crop groups are used. The agricultural parcel table data is aggregated for each farm, although Nilsson *et al.* (2022) only use a subset of larger farms to fit with additional data. Changes in parcel boundaries are taken into account thus allowing for varying clay content with time. Information from the Swedish Board of Agriculture about organic production on the farms is also used. The final dataset in Shaak *et al.* (2023) contains 835 878 observations from 83 770 farms.

Crop diversity in Southern Sweden is studied by López Hösel (2019), with a focus on the farmers' motivation for having high crop diversity. López Hösel (2019) use agricultural parcel polygons for 2014 together with block polygons from 2015 from gis.slu.se combined with agricultural parcel table data for 2014 requested directly by the Swedish Board of Agriculture. The crops are grouped into 25 classes, and some crops are excluded from the analysis.

7.4 Ecosystem services

Karlsson *et al.* (2022) relate nine ecosystem service indicators to farm type, farm size and livestock density. They use agricultural parcel polygons (2013–2019), the

Swedish Farm Register (2016) and the TUVA database from the Swedish Board of Agriculture together with other data to calculate the ecosystem service indicators. The majority of Swedish agricultural land and farms are included. Farms and IACS data which did not match are excluded. A buffer zone of 50 m around each parcel is applied to connect the parcels of a farm to e.g. land cover, roads and nature conservation areas. The number of holes in the parcels (e.g. field islets) on a farm, divided by the cropland area of the is used as a proxy for small-scale habitats. The crop diversity is calculated by overlaying the parcels of year 2016 with the parcels of the previous and following years. The crops were grouped in eleven categories.

Small arable fields can be beneficial with regard to ecosystem services and thus Nilsson and Rosenqvist (2019) study the economic profitability of crop cultivation on marginal arable land. They use block and parcel data for four municipalities in 2016. Their focus is on extensively farmed areas with ley, fallow or buffer zones. The majority of the blocks in each municipality consists of only one parcel, but the percentage is somewhat lower in the two municipalities with plains where the blocks generally are larger and thus can contain more parcels. For the parcels in the four municipalities a form factor is calculated, as well as an arable land density index and a transport distance from the farm centre.

7.5 Identify areas for environmental monitoring of pastures

The block and TUVA databases are used in a first step to identify areas for environmental monitoring of pastures (Glimskär *et al.* 2014; Lundin *et al.* 2016). Since the spatial accuracy needs to be very high for these purposes, they compare the block data with aerial photographs and produce corrected block maps. The correction is made if the difference is larger than 10 m (Glimskär *et al.* 2016). A new map of gross arable land based on aerial photographs from the middle of the 20th century is suggested by Glimskär *et al.* (2016)

7.6 Wildlife crop damage

Månsson *et al.* (2021) connect GPS data from tagged red deer to the type of land where the red deer spend their time. In the agricultural land block and agricultural parcel table data are used. The database is called SAM14. The crops are grouped into six different summer and winter crops. Blocks with several crops are treated as an unknown crop. The same database is used by Nilsson *et al.* (2016) to study cranes in fields of different sizes and with different crops. Additional information about crop stage (*e.g.* stubble, growing) is gathered in the field.

Montràs-Janer *et al.* (2020) study crop damage by large grazing birds over a period of 16 years. They use national data on crop damage from the County Administrative Boards (Montràs-Janer *et al.* 2019) together with time series on dominating crop in 25 m pixels. The crop time series data covers 2001-2014 and is compiled by Ana Villa and colleagues by creating a shapefile with a union of all blocks during the period, coupling the blocks to the crop with the largest area within the block and rasterized to 25 m.

To study the spatial associations among hunting, agriculture, and forestry Neumann et al. (2022) use data on the extent of croplands and pastures, as well as their productivity (yields and livestock units) from the Swedish Board of Agriculture and Statistics Sweden. The analysis is made on the municipality level.

7.7 Other

Other types of studies that are mentioned in the survey are:

- Usage of production animal sites for infection prevention analyses
- Modelling the risk of pesticide leaching for a specific field or a specific crop

8. Conclusions

Many employees at SLU use the support data from the Swedish Board of Agriculture and several examples are given in this report. A goal of this study was however to make it easier for SLU employees to use these very useful datasets. A survey showed that a major reason not to use the data is that one is not aware of the data or finds problems to access them. Apart from what was expected, no one answered that they avoided using the data because they found it too complicated.

We hope that this report will give more information especially about the block and agricultural parcel data that SLU requests yearly from the Swedish Board of Agriculture. Since the data are snapshots from dynamic databases the content and format may vary between years. This report tries to list the important attributes in the datasets and things that might be good to know about the data, depending on what years are studied and on the research question.

After 2013 the agricultural parcel polygons have good coverage and this reduces the time-consuming needs to couple block polygon and agricultural parcel table data.

To further facilitate the usage of the agricultural support data, it might be useful with a SLU user forum where methods and experiences can be shared.

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Appendix A. Crop codes 2022

The crop codes and the corresponding crop names of year 2022 are given in table Table 9 and the subcodes to crop 16, 57, 60, 74, 80, 85 and 88 are given in table Table 10 to Table 16.

Table 9. The crop codes and the corresponding crop names (in Swedish) for the support application of year 2022.

Grödkod	Gröda
1	Korn (höst)
2	Korn (vår)
3	Havre
4	Vete (höst)
5	Vete (vår)
6	Blandningar av baljväxter eller klöver till grovfoder/ensilage
7	Rågvete (höst)
8	Råg
9	Majs
10	Bovete
11	Spannmålsförsök
12	Blandsäd (stråsädesblandningar)
13	Blandsäd (spannmåls-/baljväxt-blandning), mer än 50 % spannmål
14	Kanariefrö
15	Hirs
16	Stråsäd till grönfoder/ensilage
20	Raps (höst)
21	Raps (vår)
22	Rybs (höst)
23	Rybs (vår)
24	Solros
25	Oljeväxtförsök
26	Högerukaraps
27	Vitsenap
28	Oljerättika
29	Rågvete (vår)
30	Ärter (ej konservärter)

Grödkod	Gröda
31	Konservärter
32	Åkerbönor
33	Sötlupiner
34	Proteingrödsblandningar (baljväxter/spannmål)*
35	Bruna bönor
36	Vicker
37	Kikärter
38	Sojabönor (oljeväxt)
39	Sojabönor (foderväxt)
40	Oljelin
41	Spånadslin
42	Hampa
43	Bönor övriga
45	Matpotatis
46	Stärkelsepotatis
47	Sockerbetor
48	Foderbetor
49	Slåtter och betesvall på åkermark med en vallgröda som inte är godkänd för varken miljöersättning eller ersättningar för ekologisk produktion
50	Slåtter och betesvall på åkermark
52	Betesmark (ej åker)
53	Slåtteräng (ej åker)
54	Skogsbete
55	Fäbodbete som inte ger rätt till gårdsstöd och kompensationsstöd
56	Alvarbete (Öland, Gotland)
57	Slåttervall på åker (kontrakt med vallfodertork)
58	Gräsfrövall (ettårig)
59	Gräsfrövall (flerårig)
60	Träda
61	Fäbodbete som ger rätt till gårdsstöd och kompensationsstöd
62	Klöverfrövall
63	Energigräs
65	Salix
66	Anpassade skyddszoner
67	Poppel
68	Hybridasp
70	Jordgubbsodling
71	Övrig bärodling
72	Fruktodling
74	Grönsaksodling (köksväxter)

Grödkod	Gröda
77	Skyddszon mot vattendrag
78	Plantskolor med odling av permanenta grödor
79	Kryddväxter och utsäde grönsaker
80	Grönfoder
81	Gröngödsling
82	Våtmark
83	Julgransodling
85	Trädgårdsodling (ej köksväxter, frukt eller bär)
86	Ej stödberättigande gröda (bara för ersättningarna inom ekologisk produktion)
87	Annan stödberättigande gröda (bara för ersättningarna inom ekologisk produktion)
88	Övrig odling på åkermark***
89	Mosaikbetesmark
90	Gräsfattiga marker
95	Betesmark och slåtteräng under restaurering

Sub codes

Seven of the crop codes have subcodes (Table 10 to Table 16). They can be one of the ordinary codes or a code higher than 100 specifying e.g. the type of vegetable grown.

Table 10. The subcodes and subcrops (in Swedish) to crop code 16 (cereals for green fodder/silage).

Grödkod	Gröda (16 Stråsäd till grönfoder/ensilage)
1	Korn (höst)
2	Korn (vår)
4	Vete (höst)
5	Vete (vår)
7	Rågvete (höst)
29	Rågvete (vår)
8	Råg
3	Havre
12	Blandsäd (stråsädesblandningar)
13	Blandsäd (spannmåls-/baljväxtblandning), mer än 50 % spannmål
100	Övrigt

Table 11. The subcodes and subcrops (in Swedish) to crop code 60 (fallow).

Grödkod	Gröda 60 Träda (räknas som en gröda i förgröningsstödet)
101	Bevuxen
102	Svart
152	Insådd för vilt
153	Insådd för pollinatörer

Table 12. The subcodes and subcrops (in Swedish) to crop code 80 (green fodder).

Grödkod	Gröda (80 Grönfoder)
13	Blandsäd (spannmåls-/baljväxtblandning), mer än 50 % spannmål
12	Blandsäd (stråsädesblandningar)
136	Fodermärgkål
3	Havre
2	Korn (höst)
1	Korn (vår)
9	Majs
34	Proteingrödsblandningar (baljväxter/spannmål)
20	Raps (höst)
8	Råg
7	Rågvete (höst)
29	Rågvete (vår)
138	Westerwoldiskt rajgräs
4	Vete (höst)
5	Vete (vår)
21	Raps (vår)
161	Blandade grödor
100	Övrigt

Table 13. The subcodes and subcrops (in Swedish) to crop code 74 (vegetables / kitchen garden crops).

Grödkod	Gröda 74 (Grönsaksodling (köksväxter))
103	Annan sallat
104	Blandade grönsaker
105	Blomkål
106	Broccoli
107	Dill
108	Fänkål
109	Gräslök
110	Grönkål
111	Gullök

Grödkod	Gröda 74 (Grönsaksodling (köksväxter))
112	Gurka
113	Isbergssallat
114	Jordärtskocka
115	Kronärtskocka
116	Kryddväxter
117	Kål
118	Kålrot
9	Majs
119	Matlök
120	Morot
121	Palsternacka
122	Pepparrot
123	Pumpa
124	Purjolök
125	Rabarber
126	Rotselleri
160	Rädisa
127	Rödbeta
163	Rödlök
128	Selleri
129	Senap
159	Sockerärt
130	Sparris
131	Spenat
156	Svartkål
132	Tomat
133	Vitkål
134	Vitlök
135	Zucchini
100	Övrigt

Table 14. The subcodes and subcrops (in Swedish) to crop code 88 (other farming on arable land).

Grödkod	Gröda 88 Övrig odling på åkermark
161	Blandade grödor
164	Cikoria
139	Gräsmatteodling
140	Humle
162	Nässla
158	Quinoa
165	Speltvete
170	Sötväppling
157	Tobak
169	Viltåker
100	Övrigt

Table 15. The subcodes and subcrops (in Swedish) to crop code 85 (horticulture).

Grödkod	Gröda 85 Trädgårdsodling
141	Aster
142	Blandade blommor
143	Blåklint
144	Dahlia
100	Fritextfält
145	Havtorn
146	Prydnadsväxter
147	Påsklilja
148	Ros
168	Sedum (fetknoppsväxter)
149	Snittblommor
150	Svartkämpe
151	Tulpanlök
166	Vallmo

Table 16. The sucodes and subcrops (in Swedish) to crop code 57 (temporary grasses/mown meadows on arable land – contract with fodder dryer).

Grödkod	57 Slåttervall på åker (kontrakt med vallfodertork)
154	Lusern
155	Annat

Appendix B. Survey about usage of support data from the Swedish Board of Agriculture

Distribution

The survey was sent out by email to employees at 14 departments at SLU. Distribution to the four departments of Aquatic Sciences and Assessment, Soil and Environment and Energy and Technology and Ecology were sent out to all employees. Distribution to the other ten departments were made by email to the head of the department or other contact persons, asking them to distribute the survey to colleagues working with agricultural land or the whole department (Animal Environment and Health; Animal Nutrition and Management; Biosystems and Technology; Crop Production Ecology; Economics; Forest Resource Management; Landscape Architecture, Planning and Management; Plant Protection Biology; Urban and Rural Development; Wildlife, Fish, and Environmental Studies).

The first e-mail was sent out March 30 and March 31 2023 with the subject "Enkät om SLU:ares användning av Jordbruksverkets stöddata / Survey about the usage at SLU of support data from the Swedish Board of Agriculture" and the text below. Sometimes an introduction was written by the e-mailer. A reminder with a shorter text was sent out May 5 2023. The last day to answer the survey was May 9 2023.

"**Har du jobbat med stöddata från Jordbruksverket? Eller har du inte gjort det och i så fall varför?**

Hjälp dina kollegor genom att svara på denna korta enkät: https://www.netigate.se/a/s.aspx?s=1138957X377461846X88250

Du kan läsa mer information om enkäten nedan eller efter att du klickat på länken och valt språk.

===

Have you used agricultural support data from the Swedish Board of Agriculture? Or if not, why have you not used it?

Help your colleagues by answering this short survey: https://www.netigate.se/a/s.aspx?s=1138957X377461846X88250

You can read more information about the survey below, or after you have clicked on the link and selected language.

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Mer information
Jordbruksverket har mycket data kopplat till stöd till jordbrukare såsom årliga block-, skifteskartor och stödsökta grödor, miljöersättningar för exempelvis skyddszoner och minskat kväveläckage, ersättningar för ekologisk produktion och djurvälfärdsersättningar. Dessa data ger en bild av hur jordbruket bedrivs i Sverige. Vi tror att dessa data skulle kunna användas ännu mer i forskning och miljöanalys än vad de gör idag. Därför vill vi samla in information om hur SLU:are använt dessa data, eller anledningar till att de inte använts.

Denna enkät är del av ett utvecklingsprojekt som finansierats av foma-programmet Jordbrukslandskap. Resultaten kommer sammanställas i en rapport som också kommer innehålla en handledning i hur man jobbar med data kring de arealbaserade stöden. Om du har några frågor om projektet eller enkäten, vänligen kontakta Elin Widén Nilsson vid institutionen för vatten och miljö (elin.widen@slu.se).

Svaren på enkäten är anonyma. Om du vill har du dock möjlighet att ange referenser till publikationer som beskriver hur du jobbat med data.

More information
The Swedish Board of Agriculture has data generated in connection with management of agricultural support programs. These include annual farm block data, parcel maps, crop lists, environmental support for e.g. buffer zones and reduced nitrogen leaching, support for ecological production and support for animal health. These data give a picture of how agriculture is managed in Sweden. We believe that these data could be used even more often in research and environmental assessment than how they are used today. To understand more about their use, we want to collect information about how employees at SLU have used these data, or reasons why they have not been used.

This survey is part of a development project financed by the Agricultural Landscapes Environmental Monitoring and Assessment programme. The results will be compiled in a report, which will also contain a guide on how to work with the

areal based support data. If you have any questions about the project or the survey, please contact Elin Widén Nilsson at the Department of Aquatic Sciences and Assessment (elin.widen@slu.se).

The answers are anonymous. However, if you want to, you have the possibility to include references to publications that describe how you have worked with these data.

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The survey

The survey started with selection of language (Swedish or English).

It was followed by seven questions. Pdf copies of the Swedish survey web pages are shown below. The translation into English can for most questions be found in section 6.

Enkät om SLU:ares användning av Jordbruksverkets stöddata

Jordbruksverket har mycket data kopplat till stöd till jordbrukare såsom årliga block-, skifteskartor och stödsökta grödor, miljöersättningar för exempelvis skyddszoner och minskat kväveläckage, ersättningar för ekologisk produktion och djurvälfärdsersättningar. Dessa data ger en bild av hur jordbruket bedrivs i Sverige. Vi tror att dessa data skulle kunna användas ännu mer i forskning och miljöanalys än vad de gör idag. Därför vill vi samla in information om hur SLU:are använt dessa data, eller anledningar till att de inte använts.

Denna **korta** enkät är del av ett utvecklingsprojekt som finansierats av foma-programmet Jordbrukslandskap. Resultaten kommer sammanställas i en rapport som också kommer innehålla en handledning i hur man jobbar med data kring de arealbaserade stöden. Om du har några frågor om projektet eller enkäten, vänligen kontakta Elin Widén Nilsson vid institutionen för vatten och miljö (elin.widen@slu.se).

Svaren på enkäten är anonyma. Om du vill har du dock möjlighet att ange referenser till publikationer som beskriver hur du jobbat med data.

1. Har du använt stöddata från Jordbruksverket?

- ◯ Ja
- ◯ Nej (gå till fråga 5)
- ◯ Vet ej (gå till fråga 7)

Om ja, d.v.s. du har använt stöddata från Jordbruksverket:

2. Vilka data har du använt?

- ☐ Gårdsstöd och förgröningsstöd (t.ex. blockkartor, skiftes- och gröddata, stödrätter)
- ☐ Kompensationsstöd och nationellt stöd till områden med sämre förutsättningar
- ☐ Stöd till ekologisk produktion
- ☐ Miljöersättningar (vallodling, fånggröda och vårbearbetning, skyddszoner, fäbodar), våtmarker och dränering samt betesmarker och slätteräng
- ☐ Djurvälfärdsersättningar, nötkreatursstöd, miljöersättn[illegible] för hotade husdjursraser

SKICKA IN / SEND >

- [ ] Stöd till fiske och vattenbruk
- [ ] Annat

3. Vilka möjligheter och hinder har du upplevt i användandet av dessa data?

Skriv ditt svar här...

4. Har du referenser till artiklar eller rapporter som visar hur du använt dessa data?

Skriv ditt svar här...

Om nej, d.v.s. om du inte har använt stöddata från Jordbruksverket:

5. Varför har du inte använt dessa data?

- [ ] Jag känner inte till dem
- [ ] Jag vet inte till hur jag får tillgång till data
- [ ] Det verkar för krångligt
- [ ] Jag tror inte jag har nytta av dem
- [ ] Annat

6. Kommentera gärna ditt svar på fråga 5. (Är det exempelvis något särskilt som verkar svårt som hindrar dig att använda data?):

SKICKA IN / SEND >

Skriv ditt svar här...

Om vet ej, d.v.s. om du inte vet om du har använt stöddata från Jordbruksverket:

7. Eventuella kommentarer:

Skriv ditt svar här...

Avslutande information

Den 25 maj kommer vi anordna ett seminarium där vi presenterar resultatet från detta projekt, med fokus på block- och skiftesdata och stödsökta grödor. Skicka gärna ett mail till elin.widen@slu.se om du vill få en inbjudan till seminariet.