



Social media community analysis report

Deliverable D4.2 (D27)

July 2022

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SHOWCASE

**SHOWCASing synergies between agriculture, biodiversity and
Ecosystem services to help farmers capitalising on native
biodiversity**



This project receives funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 862480.

Prepared under contract from the European Commission

Grant agreement No. 862480
EU Horizon 2020 Research and Innovation action

Project acronym: **SHOWCASE**
Project full title: **SHOWCASing synergies between agriculture, biodiversity and Ecosystem services to help farmers capitalising on native biodiversity**

Start of the project: November 2020
Duration: 60 months
Project coordinator: Prof. David Kleijn
Wageningen University

Deliverable title: Social media community analysis report
Deliverable n°: D4.2
Nature of the deliverable: Other
Dissemination level: Public

WP responsible: WP4
Lead beneficiary: Scienseed

Citation: Pineño.P, Chamorro.N, Martin.B, Keini.K, Raman.SC, Sánchez.L. (2022). *Social media community analysis report*. Deliverable D4.2 EU Horizon 2020 SHOWCASE Project, Grant agreement No 862480.

Due date of deliverable: Month 21
Actual submission date: Month 21

Deliverable status:

Version	Status	Date	Author(s)
1.0	Draft	22 July 2022	Pablo Pineño, Nuria Chamorro, Bruno Martin, Kira Keini, Suresh Chithathur Raman & Lucas Sánchez; Scienseed S.L.
1.0	Final	26 July 2022	Pablo Pineño, Nuria Chamorro, Bruno Martin, Kira Keini, Suresh Chithathur Raman & Lucas Sánchez; Scienseed S.L.

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Summary

Promoting communication within and among the diverse communities of stakeholders within the Experimental Biodiversity Areas (EBAs) is key to achieving the biodiversity goals of Showcase. One of the channels that can help us with these communication efforts is social media, but many questions remain regarding the **presence** and interaction of these actors on social media channels and the **content** that they prefer and actively share. Thus, the agriculture microenvironment has been characterized in Twitter in order to identify key players and organisations, define relevant audiences, and understand the best strategies, key messages and tones for communicating EBAs activities.

List of abbreviations

EU	European Union
EBA	Experimental Biodiversity Area

1 Introduction

SHOWCASE aims to raise awareness among stakeholders on the principles and best practices for biodiversity conservation in farming. Each of the Experimental Biodiversity Areas (EBAs) from the SHOWCASE project can provide expertise on certain farming and biodiversity topics which should be communicated and discussed in **dialogue with local and national stakeholders** through bespoke social media channels.

However, to carry out an effective social media strategy for each EBA, some prior **knowledge of the social media landscape** is necessary. The first step is to characterise the existing agriculture microenvironment on social media, its key players and organisations, and to analyse the contents created and consumed by these users. With these data, **specific recommendations** can be formulated for the EBA community managers to define their **social media strategy**.

This report details the **community analysis and content analysis performed** on four Twitter accounts posting agriculture-related content analogous to that which could be found in a mature EBA account focused on biodiversity conservation in farming. Of all social networks, Twitter was chosen because it is the most open for data extraction and analysis, which enables an in-depth study of the communities of followers for each account and the content published.

1.1 Description of the analysed accounts

Four Twitter accounts were chosen based on features which made them comparable to a hypothetical EBA Twitter profile: based in a European country, tweeting in one main language, for an audience that includes farmers, sharing content related to agriculture and biodiversity.

All of them are complementary in the information they provide, and capture contrasting agricultural settings in Europe: the organisations behind these accounts are located in different geographical areas and carry out different activities, thus providing a 360-degree view of the agriculture microenvironment.

The four accounts are:

1.1.1 LEAF Farming (@LEAF_Farming), in the United Kingdom

LEAF is a **charity** based in the United Kingdom that works to develop and promote sustainable farming through integrated Farm Management. This organisation collaborates directly with farmers, supply chain and stakeholders to establish a site-specific farm business approach

combining modern technology and traditional methods. The scope of this organisation brings together **actors at different levels of the farming activity** in this country that may match the stakeholder targets for the EBAs in SHOWCASE.

1.1.2 Olivares Vivos (@olivaresvivos), in Spain

Olivares Vivos is a **LIFE project** coordinated by the charity SEO BirdLife focused on the biodiversity recovery within olive plantations in Jaen (Spain), the European province with the largest area covered by this crop. Through decades, olive crops have been massively grown in this region and the biodiversity inherent to this kind of trees has been removed to favour a greater yield of olive production. Olivares Vivos is testing strategies to restore the biodiversity of this crop within demonstration farms across Jaen, monitoring the effects obtained before, during and after the intervention. This Twitter account was chosen because it is an **established EBA-like initiative** that can help to understand the audiences that are organically interested in it, as future EBAs in Showcase will have some of Olivares Vivos assets.

1.1.3 Spanish Union of Small and Medium Farmers (@UPA_Federal), in Spain

The Union of Small and Medium Farmers (UPA in Spanish) is one of the main organisations that defends the interests of farmer landowner and agriculture professional in Spain. UPA is a **federal organisation** that operates across Spain, and it is in close touch with on-land farmers but also with national and international government institutions and policymakers, including the European authorities in charge of creating the EU common agricultural framework. The Twitter account of this organisation was analysed to understand how the **farming environment** is organised in Spain and which are the stakeholders present in this social media channel.

1.1.4 Natuurrijk Limburg (@NatuurrijkLB), in the Netherlands

Natuurrijk Limburg is a **non-profit organisation** that encourages and engages landowners and land users into taking measures that protect and develop biodiversity within the province of Limburg in the Netherlands. Therefore, Natuurrijk Limburg is an actor trying to develop an **EBA structure** in an enclosed area targeting all different stakeholders within it.

2 Methods

This section describes all the actions and procedures conducted during both the community analysis and the content analysis of the selected accounts described above.

2.1 Community analysis

A **complex network analysis** was conducted for each of the selected accounts. This analysis included **sorting the followers of each account into communities** that shared some distinctive common trait to finally **identify relevant stakeholders** for the SHOWCASE project within each community.

To do this, firstly, the information on friends and followers of each account was downloaded from Twitter using the Impact Boost Tool, a software provided by Scienseed SL, a communication partner of the project.

Secondly, the analysis was performed using Gephi, a complex network analysis and visualisation software, along with Microsoft Excel.

In the representations created with Gephi, each data point is a node, that corresponds to a single Twitter account. The distribution of the accounts into communities is performed using mathematical algorithms — Fruchterman-Reingold algorithm — that aggregate the accounts or nodes according to their connectedness (shared followers or followings). The qualitative

factors that determine the formation of these clusters of nodes—shared interests, geographical areas or languages, for example—are identified manually by studying the most popular accounts within a given community.

In this case, based on the network analysis, a key topic binding each community together was identified. Further, the percentage that each community represented among the total number of followers was calculated. The **in-degree** of each account inside its given community was also determined as a metric representing how well the said account was connected within a given community. Specifically, the in-degree indicates the number of nodes inside the network that are following the selected account.

The combination of these metrics provided an estimation of the **audiences presented** in the selected accounts. **Relevant profiles for the SHOWCASE project were also identified and its importance inside each community were estimated.**

2.2 Content analysis

In order to understand narratives, tone, perspective and other variables influencing the **content shared in the agriculture microenvironment on twitter**, the publications posted by the four selected accounts were analysed.

The last 200 posts from each account were downloaded at the time of starting the study using an online tool called Social Bearing. This tool also provides other data including the most used words and hashtags and the most mentioned profiles by each account.

To carry out the analysis, the last 25 tweets of each account were discarded to avoid bias in the engagement metrics—this was done because engagement with tweets normally increases with time, but then plateaus. A **coding sheet** was created, and all tweets were analysed through the following variables:

- Date of the tweet,
- Tweet type
- Tweets using visual materials like photographs, banners, illustrations and so on,
- Number of retweets,
- Number of likes,
- Total engagement,
- Hashtags used,
- Profiles mentioned,
- Tweet content
- Tweet topic

The third variable, tweet type, included four subcategories: a) regular tweet, b) retweet, c) quote tweet, and d) reply. Tweet content refers to the material being shared and was classified into a) bibliography, b) news, c) video, d) podcast, e) website, and f) original content. The latter refers to tweets that do not share any material or that shares materials that are not the subject of the message. Finally, the last category, tweet topic, examined ten thematic areas: a) awareness and education, b) biodiversity and nature conservation, c) corporative content, d) crops and end products, e) international days, f) events about farming, g) farming practices, h) social and political issues, i) sustainable farming practices, and j) other.

These thematic categories were defined according to two criteria. They had to be **relevant to the SHOWCASE project** and they had to cover most of the content shared by the four selected accounts.

A pilot study using 50 tweets assessed the applicability of the coding list, and few subcategories were modified. Since biodiversity and nature conservation were two issues that

were often addressed together, these two groups became a single topic subcategory. Other subcategories including “Natural disasters” and “Land management” were excluded, as this first analysis did not identify content related to these issues in any of the accounts. On the contrary, some subcategories that were not initially considered were created including “Farming practices” and “Crops and end products”. An additional subcategory, “Others” was created for the tweets that did not match any of the parameters.

Using the modified coding frame, all tweets from the four selected accounts were read several times in chronological order. As many tweets met more than one parameter and it was not possible to choose the most dominant theme without biasing the analysis, some tweets were coded in more than one subcategory.

3 Results and discussion

The results of this report are split in two parts: the community analysis (complex node analysis of Twitter followers) and the content analysis (quantitative and qualitative appraisal of 200 tweets from each of the four pivot accounts).

3.1 Community analysis

In order to characterize agricultural microenvironment on Twitter and identify relevant audiences for the SHOWCASE project, a comprehensive network analysis of four pivot accounts was conducted. This section describes the results obtained from this analysis, providing data on how these accounts are organised and which profiles make them up.

3.1.1 LEAF Farming

The Twitter account that disseminates LEAF actions has a strong activity on Twitter, with around 16,000 followers at the time of the analysis.

As shown in table 1, the complex community analysis retrieved five communities that hosted different stakeholders involved in the farming activity. The biggest community comprises profiles that follow @LEAF_Farming, some UK media specialised in farming and UK farming organisations in this country but are not significantly linked to the rest of the profiles in the account audience. This bigger community also includes profiles that belong to the **international farming sector**; profiles that use English language to communicate. Examples of these accounts are the US Farm Service Agency, the Swiss company Syngenta or global farmer networks such as Global Farmer Net. Greater organisms such as FAO are also present within this community.

Table 1. Results from the community analysis performed on LEAF Farming account.

LEAF Farming		
Community	Label	% Nodes
C1	Profiles following LEAF and UK farming media. International farming sector.	29.31%
C2	UK government agro agencies and charities	27.57%
C3	UK farming activity. Dairy and livestock production sector	19.84%
C4	UK crop farming sector	14.59%
C5	UK food organisations and fruit and vegetable production	8.69%

The second community include UK government organisations related to the **sustainable development of farming**, such as the Department for Environment, Food and Rural Affairs, and UK **charities and non-profit organisms related to agroecology, organic farming, and**

sustainable rural development (e. g Soil Association). One fraction of these audiences spins around **European sustainability organisations** such as European Commission's Directorate for Environment. This community also comprises organisations focused on **farming awareness** and educational activities in which LEAF is also involved.

In the third community we can find profiles directly related with the **farming activity in UK**. When dividing these profiles into subcommunities, we can also identify **specialised media and journalists** (e.g. rural news from BBC) focused on farming. However, most of the profiles within this community belong to on-field farming, including farm owners, workers and local supply companies. The network organises mostly around **dairy and livestock** producers, with a strong separation between beef and sheep farmers. In addition, when diving into the profiles, there is a geographic division between England and Scotland. Another relevant organisation is the Young Farmer Club, which coordinates a subcommunity of young UK farmers.

Similarly, the fourth community is also built around farming activity, but profiles belong to the **UK arable land sector**. We could find **agrobusiness** related to **crop production, agronomists, suppliers** and **media** specialised in crops, but most profiles are **small and medium farmers and unions** related to cereal and vegetable production. Some examples are the Agriculture and Horticulture Development Board for cereals and oilseeds and the technical team at Syngenta UK covering varieties and crop protection products.

Finally, the fifth and smaller community is comprised of UK **horticulture production sector**, divided into vegetables, berries and other fruits. However, in this case there are also profiles related to the late stages of farming, which is the selling market of the products. In this direction, beside companies involved in sales, this community includes representatives of the **gastronomy sector** and the **food and drink industry**, such as the Great British Chefs club and British national food promotion accounts.

The analysis of this account demonstrates the **presence of farmers on Twitter**, at least in the UK. Most of **farming stakeholders can be found** at a local, national and international scale, even though it is an organisation that only operated in certain areas of the UK.

3.1.2 Olivares vivos

The Twitter account @olivaresvivos had around 2600 followers at the time of the analyses and were classified into four communities (Table 2). The bigger one comprises profiles related to **environmental and conservation organisations** that focus on biodiversity protection, such as SEO Overlife (coordinator of Olivares Vivos), WWF or the Natura network. Greater organisations such as the European Commission's Directorate-General for Environment and the one for the Climate Action are also within this community. The second community is built upon **the olive and olive oil sector in Spain**, with specialised media and organisations that promote this industry (e. g the Iteprofesional Spanish Olive Oil Association, Óleo magazine, and the Olive Tree Technology Centre in Jaen). Most of the profiles belong to different stakeholders of **olive oil market in the Jaen region**. In the third community we could find profiles related to the **Spanish agriculture sector**, with specialised media, suppliers, farmer unions and agronomic engineers, such as the agro 2.0 magazine, the Spanish Rural Development Network, the Spanish Union of Small and Medium Farmers and the Coalition for an agricultural policy. Finally, there is a smaller community of profiles that are not so related with the rest of @olivaresvivos audience, which comprises other LIFE projects and Jaen profiles not related to farming.

Table 2. Results from the community analysis performed on Olivares vivos account.

Olivares vivos		
Community	Label	% Nodes
C1	Environmental and conservationist organisations	47.73%
C2	Spanish local olive oil sector: producers, news and business	26.94%
C3	Spanish government agencies, agro magazines and agro engineers	15.71%
C4	LIFE projects, biologists, and profiles from Jaen.	9.62%

Relevant stakeholders are present within Olivares Vivos audience. Farming environment is well represented at a **local level**, but there are also **national organisations** and **international environmental profiles**, which have probably reached the account because it is a LIFE programme.

3.1.3 Spanish Union of Small and Medium Farmers

The Spanish Union of Small and Medium Farmers account (UPA in Spanish) had around 8,800 followers when the analysis was performed. As shown in table 3, the biggest community retrieved comprises profiles of **national politicians and political parties of all political signs, and public government agencies** divided into the Spanish regions of Andalusia, Extremadura, Castilla y Leon and Castilla-La Mancha. All these regions have in common that agriculture has historically been the main economic activity in them, and it remains a central source of employment and entrepreneurship in these areas. Some examples of these profiles are the official account of the Unión Progreso y Democracia (UPYD) Spanish party, the Regional Government of Andalusia, the provincial government of Cáceres and the Regional Government of Castilla y León. Other farming unions and UPA affiliations in certain Spain regions are presented in this community (e. g Spanish General Workers Union and UPA Extremadura).

Table 3. Results from the community analysis performed on UPA Federal account.

UPA Federal		
Community	Label	% Nodes
C1	Spanish political parties, public organisms, and unions.	29.31%
C2	Latin American agricultural profiles: news, business, and engineers.	16.68%
C3	Spanish agro engineers, agro journalism, and agro business.	15.89%
C4	Spanish environmental agencies, NGOs, and local agroecology organisations.	13.36%
C5	Spanish food industry, meat livestock and EU agri-food institutions.	9.76%
C6	Spanish gastronomy, olive oil, and wine sectors.	8.52%
C7	Spanish and Italian fruit and vegetable sector: cooperatives and companies.	4.79%

The second community includes as most relevant profiles **online news of agriculture, agronomic organisations and agrobusinesses** across Spain and Hispano-America, such as Mundo Agro Chile magazine, the Agronomic engineers association and Picasso Seeds, an Argentinian agribusiness with more than 39K followers. There are many agrotech **entrepreneurs and agronomic engineers** in this community with a technical relationship with the farming process, but there are no landowners.

In the third community we can **find Spanish media and journalists** specialised in agriculture (e. g Huerta digital magazine), profiles related to the agrotechnology sector, **agronomic colleges** (e. g School of Agricultural and Forestry Engineering of the University of Cordoba) and profiles linked to the **horticultural sector in Spain**.

The fourth community is built upon the **agroecological sector in Spain**, including official environmental agencies, agroecological associations, profiles linked to rural development and the Spanish profiles of international non-government agencies such as SEO or WWF. Some examples of these profile are the Spanish Rural Development Network and the Spanish Society of Organic Agriculture).

The fifth community comprises profiles related to the **Spanish food industry**: government food agencies, livestock production sector and dairy sector, such as the Spanish Ministry of Agriculture, Fisheries and Food, the Spanish Federation of Food and Drink Industries and the National Association of Meat Industries in Spain. Within the livestock subcommunity, the profiles are sorted according to the type of exploitation, with a strong presence of beef and pork sector. In this community we can also find European agencies of agriculture whose profiles are in English such as the European Commission agricultural policy account and the European Commission's Directorate-general for Health and Food Safety.

The sixth community involves the **gastronomy sector in Spain** and professionals linked to **food manufacture**. It comprises profiles as well related to agricultural products such as olive oil and wine from the Spanish regions where these are made (e. g red wine and La Rioja). Some examples are the Interprofessional Spanish Olive Oil Association and the Spanish Wine Federation.

Finally, the seventh community involves profiles from the fruit **horticultural sector in Spain**, mostly from the Valencian, Andalusian and Murcian region where these fruit crops are more common (e. g the Business Platform for International Horticultural Trade and the Valencian Seminar on fruit and vegetable sector).

The analysis shows that UPA Federal audience reaches many of the **Spanish farming stakeholders** with a strong presence of **government accounts**. When we dive into the communities, we see a classification between different agricultural sectors. In addition, unlike LEAF analysis, no self-described farmers were identified in the analysis.

3.1.4 Natuurrijk Limburg

The Twitter profile of this organisation has 616 followers at the moment of the analysis, and it has been active since November 2012. As shown in table 4, the biggest community retrieved from this small audience comprises profiles that belong to **environmental and non-government organisations** from the Limburg region such as IKL, an NGO which works on preserving and developing the Limburg landscape, and the Nature and Environment Federation of Limburg. Some Limburg politicians can also be found in this community.

Table 4. Results from the community analysis performed on Natuurrijk account.

NatuurrikLB		
Community	Label	% Nodes
C1	Nature organisations, NGOs, and politicians from Limburg province.	31.55%
C2	Farming sector in Limburg province: farmers and agro entrepreneurs.	24.6%
C3	Conservationism and environmental organisations in Limburg province.	22.33%
C4	Netherland nature disseminations and citizen organisations.	21.52%

The second community hosts profiles related to the **farming sector** in the same area, from individual farm owners to agricultural entrepreneur organisations (e. g LLTB, lobby of Limburg agricultural entrepreneurs). In the third community we could find accounts related to **conservationism and forest management** organisations and professionals and, as well as the previous two communities, these profiles are based in the Limburg province. The latter and smaller community holds Dutch profiles beyond this region that belong to nature dissemination and citizen organisations.

The account has a small audience with a **strong presence of Limburg profiles**. No international profiles have been identified, and few come from out of Limburg province. However, **local representatives of relevant stakeholders**, such as policy makers, farmers, agrobusiness and NGOs are visible even with a preliminary analysis

3.2 Content analysis

This study examined a total of 700 tweets posted by four pivot Twitter accounts from the farming community in Europe. After analysing the data collected as described in section 2.2, the main findings were as follows.

Publication frequency correlates with number of followers, reach and impressions

For each account, the last 200 tweets were selected for this frequency analysis from the start date of the study. Dividing by the number of days it took to publish these tweets gives an estimate of publication frequency, which ranged from 25 tweets/week (LEAF Farming) to just 1 (Natuurrijk Limburg). See Table 5 for full details.

Table 5. Data for publication frequency and audience metrics of the four pivot accounts (reach and impressions are total figures for the 200 tweets analysed in each account).

Account	Number of tweets	Number of days	Tweets / week	Reach	Impressions	Followers
@LEAF_Farming	200	57	25	24,198	4,790,810	24,900
@UPA_Federal	200	72	19	17,424	3,431,940	17,500
@olivares vivos	200	238	6	3,459	536,355	3,511
@Natuurrijk LB	200	1,013	1	655	121,000	648

As can be seen in Figure 1, a higher publication frequency was associated with more followers on Twitter, and more reach and impressions as well (these are measures of the number of people who see or are exposed to the Tweets on their timeline, respectively). All accounts were created between 2010 and 2012, therefore it is unlikely that there are significant differences in the number of followers due to account age.

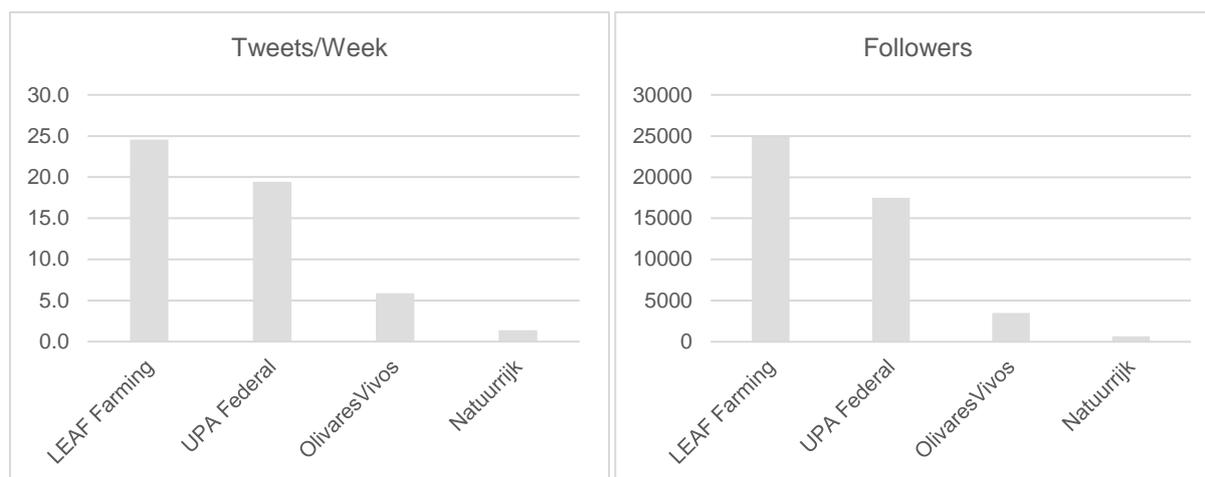


Figure 1 Graphs showing strong correlation between publication frequency and number of followers of the four pivot accounts.

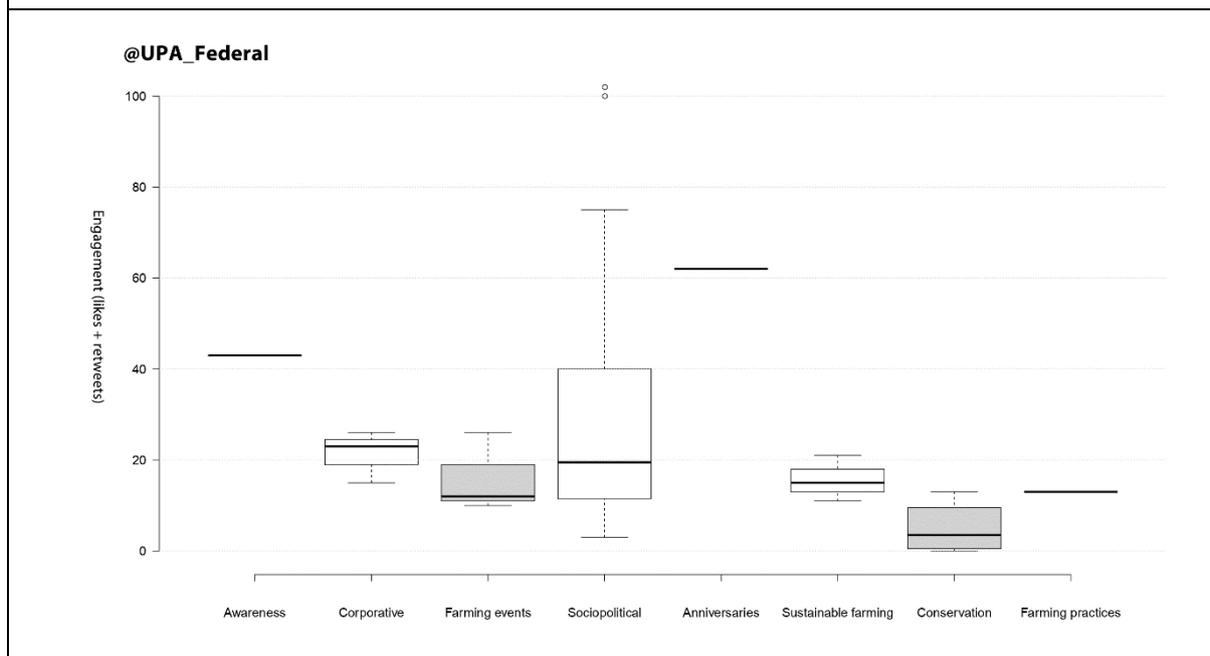
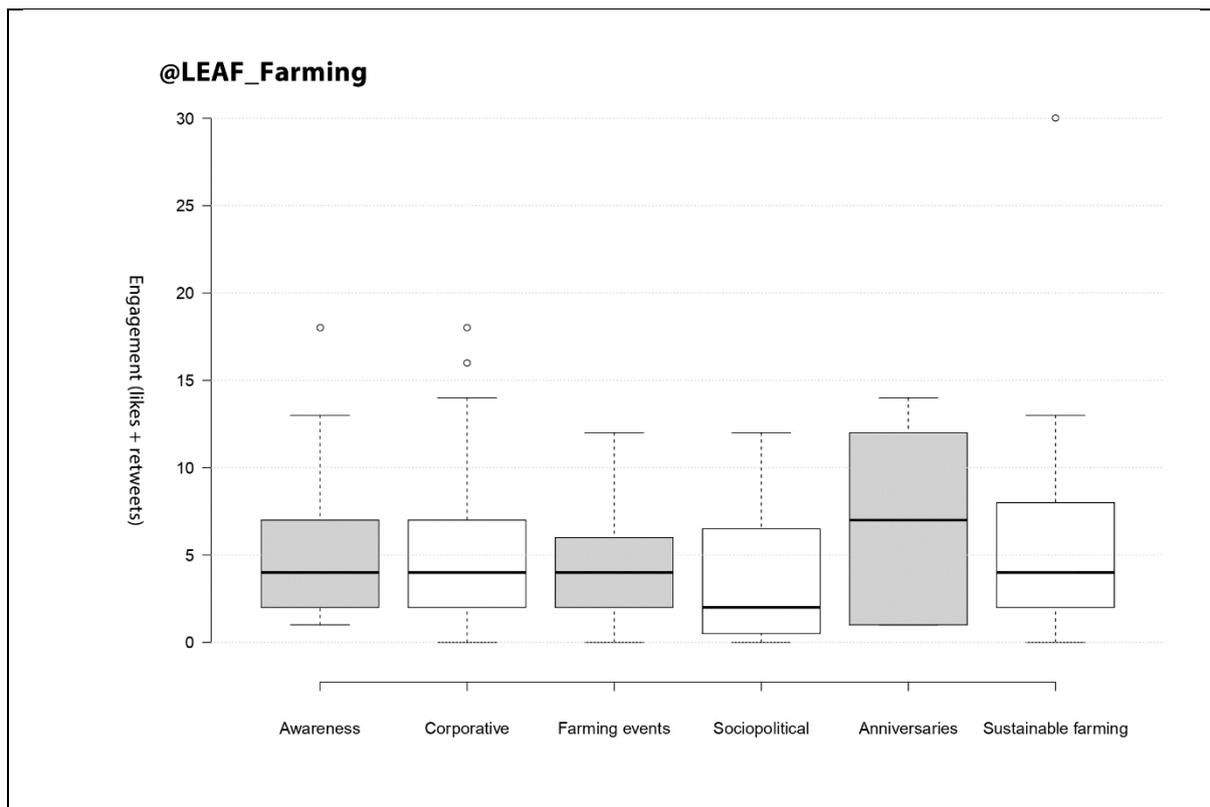
These results indicate that, regardless of writing style, quality or the content of tweets, simply posting more frequently is a possible strategy for reaching a wider audience on social media.

Socio-political issues and anniversary Tweets attract high engagement

All four accounts shared content spanning a range of topics, including tweets for awareness and education, “corporative” tweets with information about the organisation, notices for events aimed at farmers, social and political messages, anniversaries such as international days, tweets on sustainable farming, tweets on biodiversity conservation and tweets describing farming practices.

However, the four pivot accounts vary in the relative proportion of posts from each of these categories, and the tone with which they are written. With the exception of LEAF, all accounts **achieved highest median engagement (likes + retweets) with two specific categories** of tweets: sociopolitical and anniversaries (**Figure 2**). The first includes messages on **farming policy and the social ramifications** of agricultural practice that are relevant to each account’s community of followers. For example, UPA, as an association of unions, tweets successfully about labour rights and feminism in farming. Natuurrijk Limburg has a string of popular tweets discussing the European regulations on nitrogen emissions which could affect farming intensity in the area. The second category, **anniversaries, includes posts shared on recognised dates** such as Earth Day, where social media activity increases around the topic and specific hashtags used worldwide are included to amplify the account’s voice.

In accounts dedicated to promoting green practices in farming (Olivares Vivos, LEAF and Natuurrijk), **tweets related to conservation and biodiversity or to sustainable farming practices** performed well in engagement, achieving some of the highest quartile values in likes+retweets, but still ranked lower in median engagement compared to the previously mentioned categories. Tweets advertising farming events or events for farmers ranked lowest in median engagement, presumably due to the local nature of these activities. Tweets coded as “corporative”, which includes all **content relating to the institution** doing the tweeting, showed great variability, normally achieving average performance but **occasionally reaching outlier engagement values** in the range of hundreds of likes + retweets.



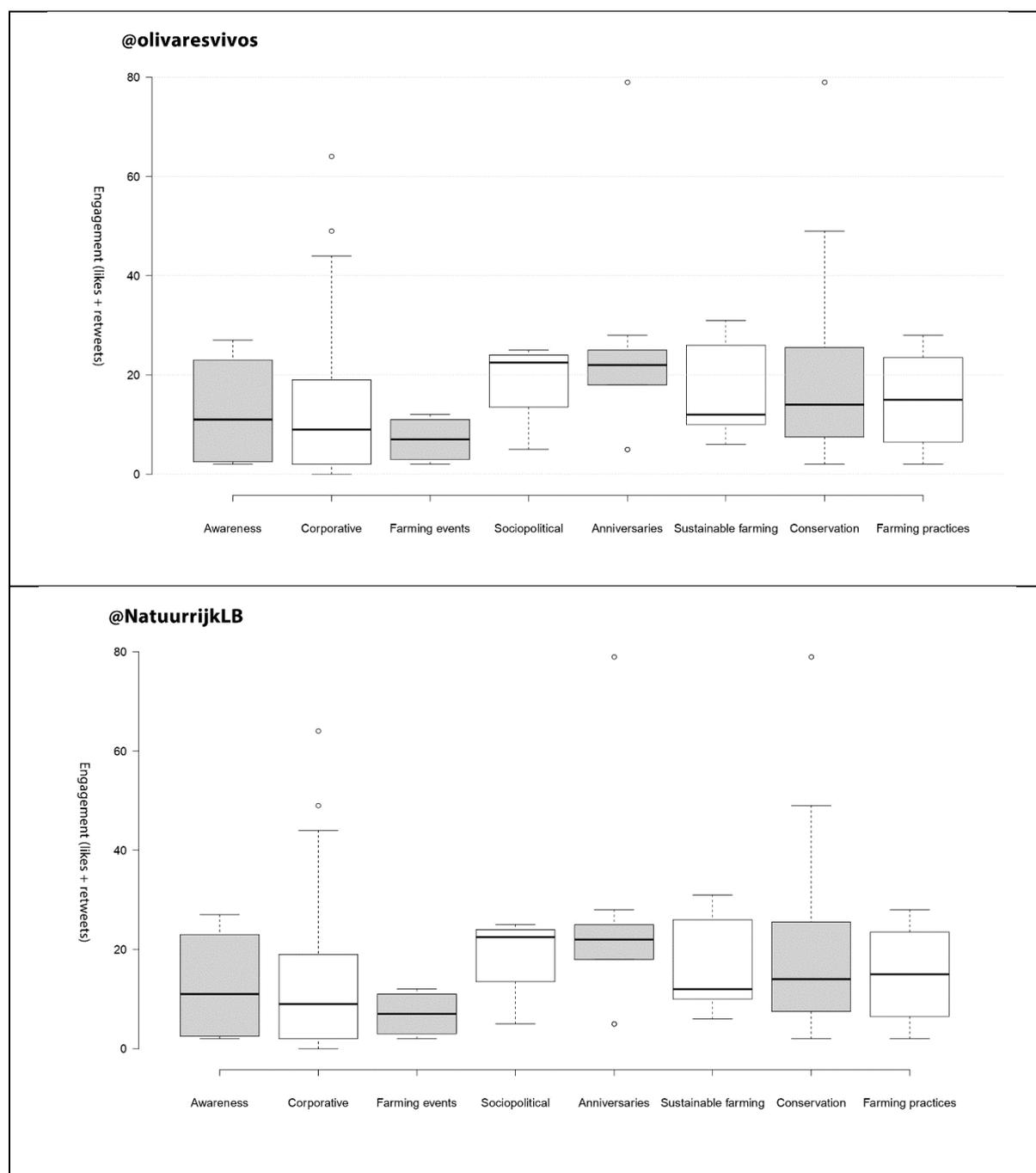


Figure 2. Boxplots showing distribution of engagement (retweets + likes) for tweets (excluding retweets) on different topics, in each pivot account. Black bars indicate the median, box edges are quartiles and whiskers show the full range, with dots representing outliers.

Extreme outliers, with engagement values >150, have been omitted from these graphs but do not significantly affect the interpretation of the results or the summary statistics. These outliers were found in LEAF (1 in awareness and 2 in corporative) and UPA (1 in sociopolitical).

Sharing news links is an effective engagement strategy

By far, **the most common content strategy** followed in these accounts was the publication of **self-produced posts**: tweets with original text and/or images pertaining to the project itself, or linking to its website, to its events and to other self-produced materials (**Figure 3, Table 6**). However, occasional tweets containing YouTube links (coded as “video”) or links to media

articles from third-party websites (coded as “news”), outperformed the self-produced content with higher median values in engagement. Notwithstanding, “own content” has great variability and, due to the high volume of tweets in this category, some achieved outlying values with hundreds of likes + retweets.

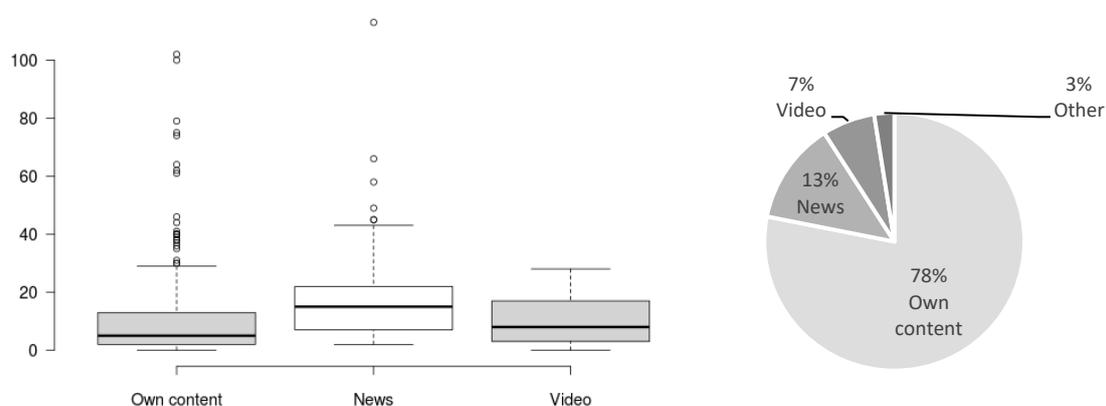


Figure 3. Left: boxplot showing distribution of engagement (likes+retweets) for tweets (excluding retweets) with different types of content, from all pivot accounts. Black bars indicate the median, box edges are quartiles and whiskers show the full range, with dots representing outliers (full data in Table 6). Extreme outliers, with engagement values >150, have been omitted from this graph but do not significantly affect the interpretation of the results or the summary statistics. These outliers, 4 tweets in total, were found in the category of “own content”. **Right:** pie chart showing proportion of tweets found in each category of content.

Table 6 Boxplot summary statistics for Figure 3

	Own content	News	Video
Upper whisker	29	43	28
3 rd quartile	13	22	17
Median	5	15	8
1 st quartile	2	7	3
Lower whisker	0	2	0
Data points (n)	247	41	21

Farming language is tailored to the content, but also to the audience

Overall, all accounts use words related to agriculture, but each project uses **specific terms and hashtags related to its activity** (Figure 4, Figure 5).

For example, Olivares Vivos uses the terms "biodiversity" and "olive grove" a lot, as its activity is focused on this crop. The word "birds" is also one of the most frequent terms, as it is a project coordinated by SEO BirdLife. For its part, LEAF uses words and hashtags more related to sustainability in general such as "sustainable", "nature based", "environment" and "climate". Other expressions that attract attention are those associated with production, which is part of LEAF's activity, such as "food" or "livestock". The other two accounts also use terms and

hashtags that can be related to their activity, such as "elections" and "rural" in the case of UPA Federal and "landscape" and "biodiversity" in the case of LEAF. In addition, in these two accounts that operate in a very specific geographical area, UPA Federal at the national level and Natuurrijk Limburg at the local level, the words "Spain" and "Limburg" are frequently used.

There is also a use of **language associated with the different audiences** of each of the accounts, which can be related to the results of the community analysis described in section 3.1. For example, UPA Federal uses the first-person plural ("our fields", "our farmers") and talks about the "countryside" which is how farmers refer to their land. Olivares Vivos publishes frequently about cost-effectiveness because it tries to persuade farmers to use new practices. Both LEAF and Natuurrijk Limburg also use terms related to union such as "join", "together" and "our".

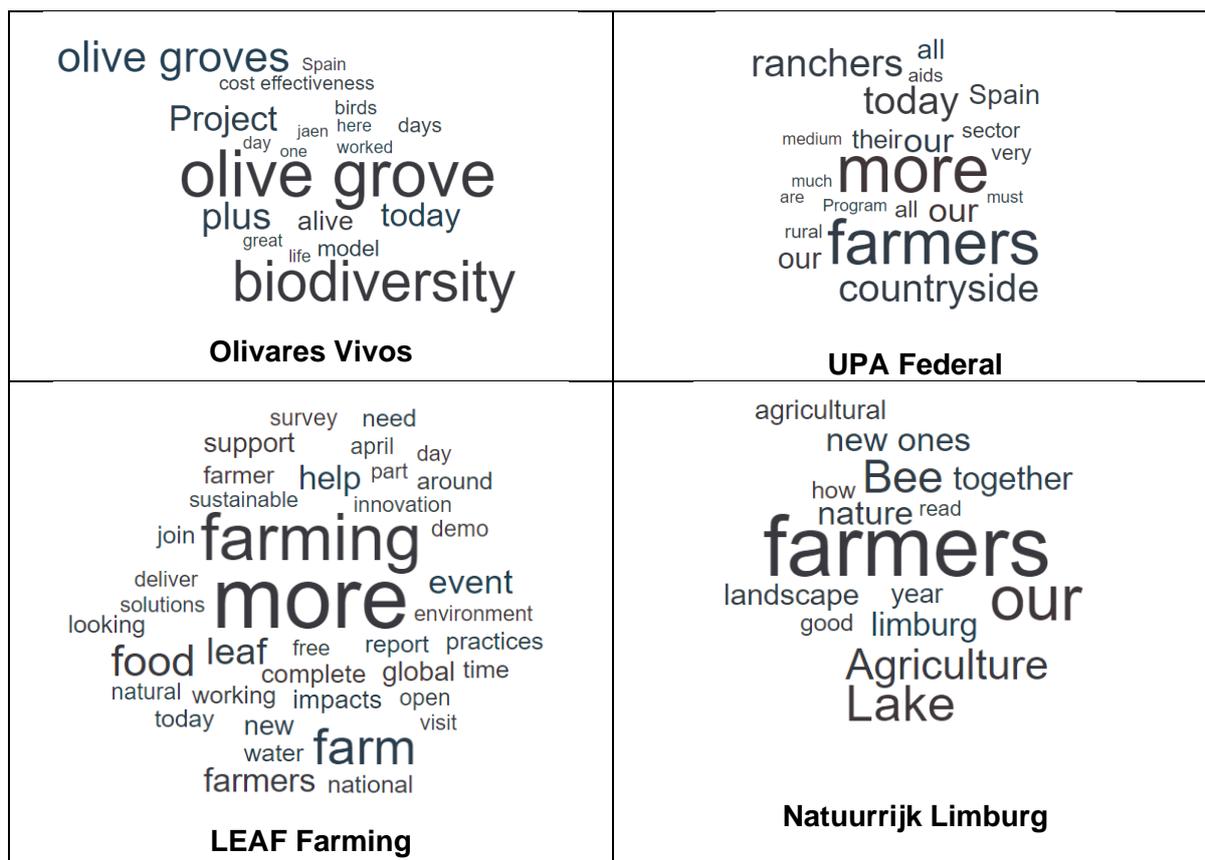
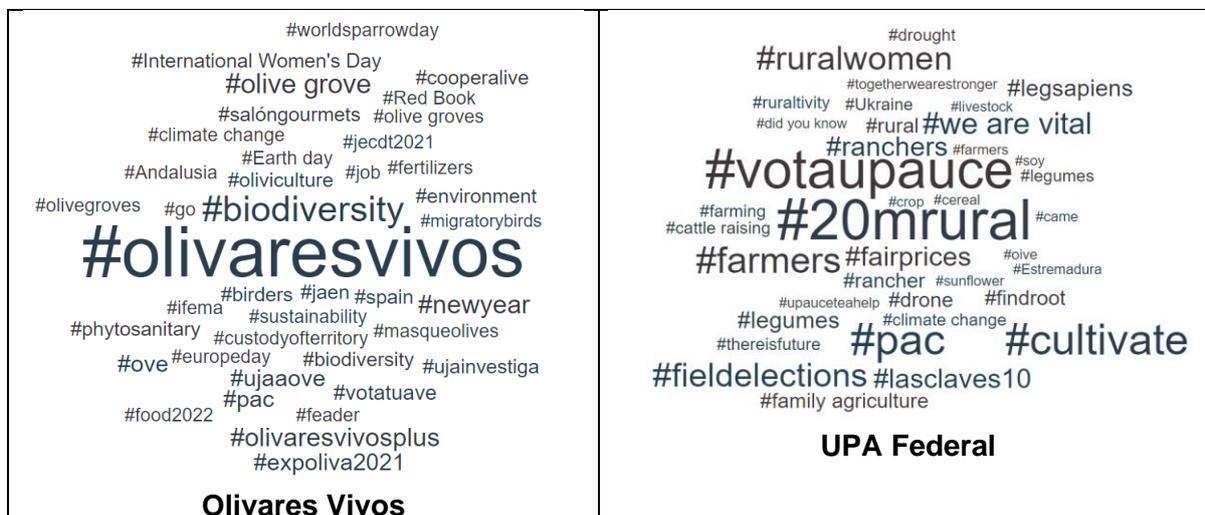


Figure 4. Word clouds showing the most tweeted words in each pivot account.



- *Los tractores y los manifestantes comienzan a llenar las calles de Madrid de campo. Por unos precios justos para nuestros productos 🇪🇺 Por un medio rural vivo y de progreso. #20mRural #JuntosPorElCampo*
[TRANSLATION: Tractors and demonstrators begin to fill the streets of Madrid with the countryside. For fair prices for our products 🇪🇺 For a living rural environment and progress. #20mRural #TogetherForTheCountryside]
- 🥁🥁 *Una batucada del pueblo de Ojosnegros #Teruel trae a Madrid la fuerza de nuestro mundo rural. Un medio rural que está vivo y que tiene futuro. Vaya si tiene futuro. #20MRural #JuntosPorElCampo*
[TRANSLATION: 🥁🥁 A marching drum ensemble from the town of Ojosnegros #Teruel brings the strength of our rural world to Madrid. A rural environment that is alive and has a future. And what a future. #20MRural #TogetherForTheCountryside]
- *Por todas las mujeres que trabajamos cada día para producir alimentos. Las #MujeresRurales somos ejemplo de fuerza, emprendimiento e ilusión por un futuro mejor para todos. Un futuro en paz y en igualdad. Feliz #8Marzo2022 #DíaInternacionalDeLaMujer*
[TRANSLATION: For all the women who work every day to produce food. The #RuralWomen are an example of strength, entrepreneurship and enthusiasm for a better future for all. A future in peace and equality. Happy #8March2022 #InternationalWomensDay]

Relevance to the reader is another resource that is appealed to the several of the most popular tweets from the UPA account. They focus on issues that affect the whole society, not just the farming sector.

- *Pedimos RESPONSABILIDAD a los transportistas en sus protestas 🚛🚛🚛 El pienso para los animales y la salida de producto (especialmente el más perecedero) para la sociedad son sagrados. Con las cosas de comer no se juega. Protesten, pero la cadena alimentaria no puede detenerse.*
[TRANSLATION: - We ask lorry drivers for RESPONSIBILITY in their protests 🚛🚛🚛 Animal feed and product output (especially the most perishable) for society are sacred. We don't play with food. Protest, but the food chain cannot be stopped.]

Regarding the Olivares Vivos account, the use of **identity issues** and features to attract the audience should be highlighted. Specifically, the most popular tweet posted by this account mentions a poem by Rafael Alberti, and Andalusian poet who is a hallmark of Spanish and Andalusian culture.

- *¿Qué es un olivo? Un olivo es un viejo, viejo, viejito es un niño con una rama en la frente y colgado en la cintura un saquito todo lleno de aceitunas. Rafael Alberti. #DíaDelOlivo*
[TRANSLATION: What is an olive tree? An olive tree is an old, old, old man and also a child with a branch on his forehead and a little bag full of olives hanging around his waist. Rafael Alberti. #OliveTreeDay]

Relating to literature, this account also uses very powerful **visual metaphors** in some tweets.

- 🌳🌳🌳 *De grandes e inertes 'polígonos de olivos' a olivares llenos de vida [elconfidencial.com/medioambiente/...](https://elconfidencial.com/medioambiente/) #OlivaresVivos por @mariaguenteCC @LIFEprogramme, @SEO_BirdLife*

[TRANSLATION: 🤔🤔🤔 From large and inert 'industiral estates of olive trees' to olive groves full of life [news article link] #OlivaresVivos by @mariagfuentesCC @LIFEprogramme, @SEO_BirdLife]

This account also uses **mentions to promote their tweets**. It mentions profiles with a lot of followers such as @SEO_BirdLife or @LIFEprogramme who give visibility to its tweets, contributing to its popularity.

Finally, it is worth mentioning the use of a **positive tone** rather than a negative one. Both Olivares vivos and LEAF approach environmental challenges with responsibility and positivity rather than guilt.

- Al consumir AOVE con el sello Olivares Vivos, 🇪🇵 no sólo estarás adquiriendo un producto de gran calidad, sino que además, estarás contribuyendo a la conservación de la biodiversidad, 🌿 la lucha contra el cambio climático 🌍 o al desarrollo rural 🏡. #olivaresvivos #aove
[TRANSLATION By consuming EVOO (extra-virgin olive oil) with the Olivares Vivos seal, 🇪🇵 you will not only be acquiring a high-quality product, but you will also be contributing to the conservation of biodiversity, 🌿 the fight against climate change 🌍 or rural development 🏡. #olivaresvivos #evoo]

4 Conclusions

As a result of this communication analysis examining the agriculture microenvironment on Twitter through both a community and a content analysis, the following conclusions have been extracted:

1. At first level of analysis, for each account some **relevant stakeholders** are already visible. Showing it is possible to **tailor the message to different actors** in a single account.
 - a. LEAF Farming: farmers, farm managers, unions, suppliers, rural charities.
 - b. UPA Federal: policymakers, business, technical profiles.
 - c. Olivares vivos: local small producers, environmental NGOs.
 - d. Natuurrijk Limburg: government associations, politicians, environmental NGOs and farmers at local level.
2. The relationship between accounts of different actors is apparent, leading to the formation of **identifiable communities** that largely represented one stakeholder group relevant to the agricultural microenvironment.
3. All four accounts share **content spanning a range of topics** related to agriculture, but they vary in the relative proportion of posts from each of these issues and the tone with which they are written.
 - a. Due to its activity, UPA Federal has a **strong presence of politicians and governmental institutions** which is lacking in the other accounts except for Natuurrijk Limburg. In both accounts, **content related to social and political issues** is recurrent, which could be more interesting for this type of audience.
 - b. Although we find profiles related to **environmental advocacy and sustainability** in all accounts, their presence is much more evident in Olivares vivos and LEAF, accounts in which **contents related to biodiversity, conservation and sustainable practices** are recurrent.

- c. Self-described farmers are only visible at LEAF and Natuurrijk Limburg accounts. In the Spanish accounts workers are described as producers, suppliers, landowners and agronomists. This is possibly related to the **identity terminology** of each geographical region.
4. Both the **use of language and the topics** shared are associated with the **different audience** predominant in each account.
5. There is a difference between **local and national** accounts.
 - a. On the one hand, Olivares vivos has a strong presence of profiles from Andalusia, the Spanish region where it operates. Similarly, the audience of the Natuurrijk Limburg account is limited to the Limburg area and some Dutch profiles. This is reflected in the content they share and in the language they use, which appeals to the **identity traits and interests of each region**.
 - b. On the other hand, LEAF and UPA Federal, which operate at the national level, in the UK and Spain, respectively, use language that appeals to **farmers' sense of community**, and draws on national identity traits. The content shared by both accounts tends to address issues of the **farming sector in general** and not particular to different geographical areas.
6. A general finding, which is not exclusive to farming communication and likely applies to all social media activity, is that **higher frequency of publication correlates with a larger number of followers** and higher online visibility metrics (reach and impressions).

With all the information extracted from this analysis, in the coming months a recommendation document will be drafted with specific tips for EBA community managers to define their social media strategy.

5 Acknowledgements

We thank Dr. Ignasi Bartomeus from EBD-CSIC and José Van Paassen from Wageningen University for their kind support towards the completion of this task.

Annex 1

Details about the community analysis results of the selected accounts

These figures show the map of communities obtained after the analysis of the accounts with the Gephi software. Each dot on the graph represents a node (or user account), and each line connecting the nodes represent a relationship of following between two nodes.

Figure 6. Map of communities found in the LEAF Farming account.

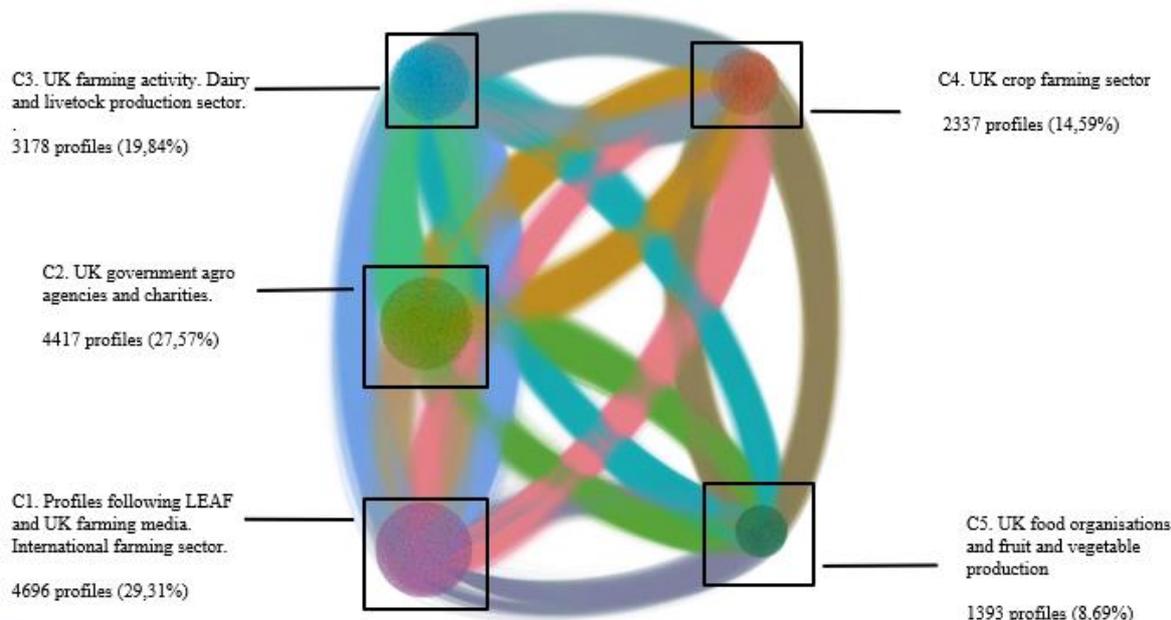


Figure 7. Map of communities found in the Olivares vivos account.

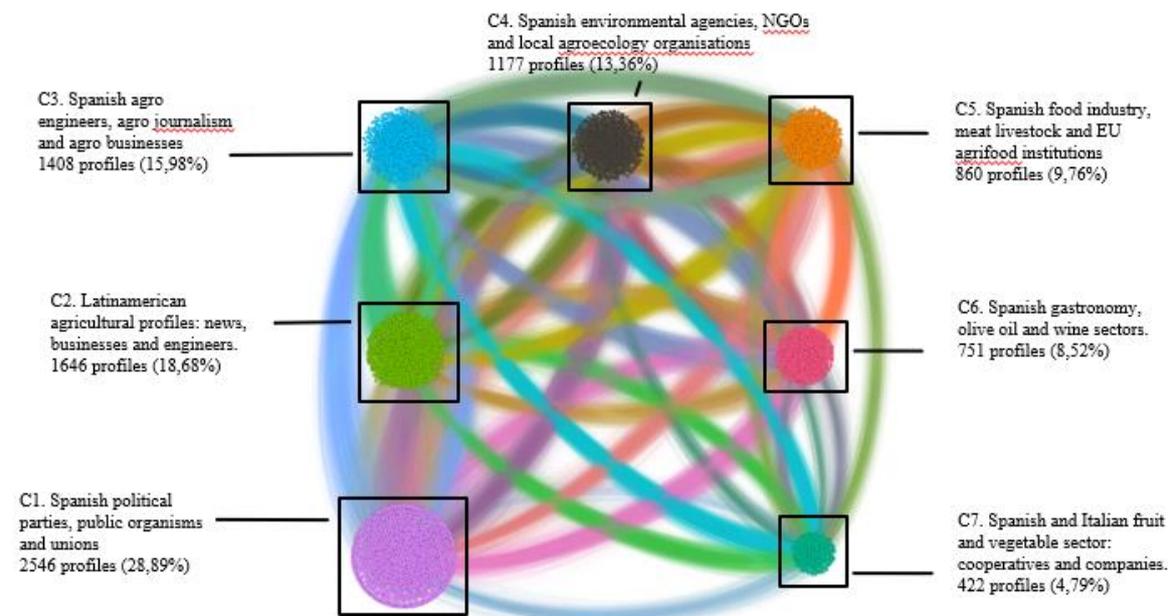


Figure 8. Map of communities found in the UPA Federal account.

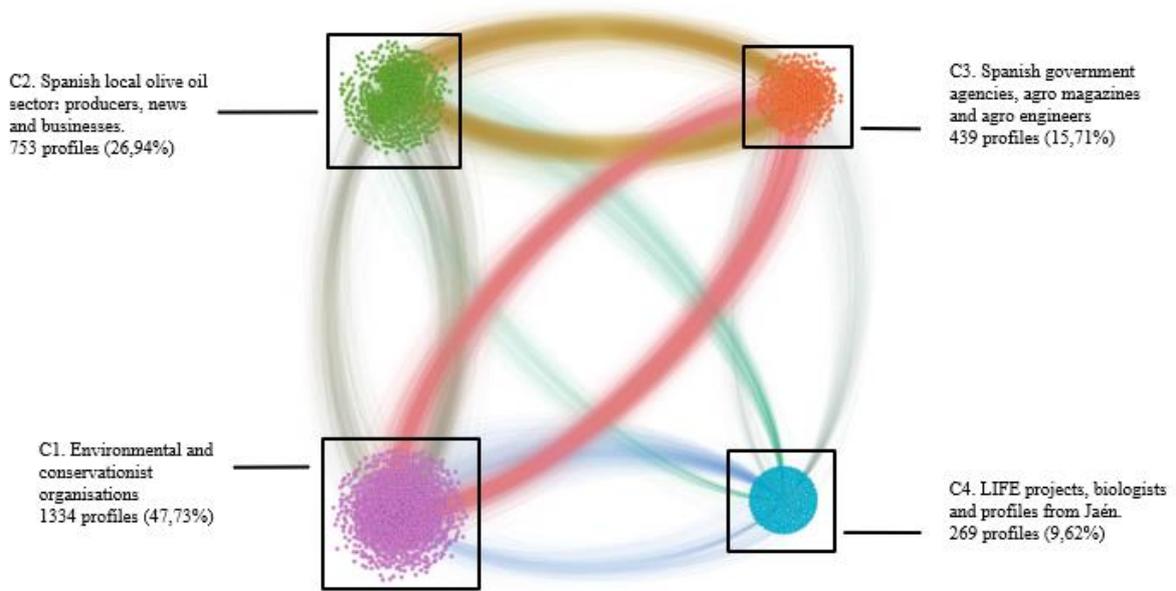


Figure 9. Map of communities found in the Natuurrijk account.

