PRO-GRACE
PROMOTING A PLANT GENETIC RESOURCE COMMUNITY FOR EUROPE

Funded by the European Union

How and why collect phenotyping data on farm?

Riccardo Bocci – Rete Semi Rurali - Italy

Brussels

28th June 2024

I nostri Soci

Rete Semi Rurali è un Ente del Terzo Settore i cui soci sono altre persone giuridiche, pubbliche e private, con fini di lucro o senza fini di lucro, che condividano i valori e le finalità di RSR.

Per diventare socio bisogna inviare una domanda al Coordinatore della Rete con allegato il verbale dell'organo di amministrazione dell'organizzazione che autorizza l'adesione, statuto e atto costitutivo, una dichiarazione di conoscenza e accettazione integrale di Statuto, e Regolamenti della Rete, e un impegno al rispetto delle deliberazioni legalmente adottate dagli organi associativi. L'Assemblea, ricevuta la domanda di ammissione, provvede quindi a decidere se accettare o rigettare la domanda di ammissione.

Per informazioni scrivere a info@semirurali.net.

Ad oggi (settembre 2023) i soci di RSR sono:

AIAB - Associazione Italiana per la Agricoltura Biologica - Bova Marina (RC)

Arcoiris srl - Modena (MO)

APS Devélo Laboratorio di cooperazione Peschiera Borromeo (MI)

APS "Marina Serra" - Tricase (LE)

Associazione Agricoltori e Allevatori Custodi di Parma Parma (PR)

Associazione Coltivare Condividendo Seren del Grappa (BL)

Associazione per l'Agricoltura Biodinamica Milano (MI)

Associazione di Produttori Agricoli POLYCULTURAE Rovasenda (VC)

Associazione Simenza Cumpagnia Siciliana Sementi Contadine - Raddusa (CT)

ASCI - Associazione per la solidarietà per la campagna italiana - Torino (TO)

A.Ve.Pro.Bi - Associazione Veneta dei Produttori Biologici e Biodinamici - Villafranca di Verona (VR)

Centro Sperimentale Autosviluppo - Domusamigas Iglesias (SU)

35
Soci nel 2023

16
Regioni nel 2023

Civiltà Contadina ODV - San Leo (RN)

Con.pro.bio Lucano - Metaponto (MT)

Consorzio Produttori Solina d'Abruzzo Soc. Coop. Agric. - Sulmona (AQ)

Consorzio della Quarantina - Torriglia (GE)

CTPB - Coordinamento Toscano Produttori Biologici Firenze (FI)

Des.Bri - Comitato verso il Distretto di Economia Solidale della Brianza - Villasanta (MB)

Distretto di Economia Solidale Altro Tirreno Vecchiano (PI)

Diversamentebio - Rubano (PD)

Geoponika - Roma

Germinale Società Cooperativa Agricola di Comunità Demonte (CN)

Grani di Tradizione dell'Oltrepò - Montesegale (PV)

Il Forno di Vincenzo ODV - Eboli (SA)

La Fierucola Associazione APS - Fiesole (FI)

La Piazzoletta - Semproniano (GR)

La Pimpinella APS - Villa Lagarina (TN)

La Terra e il Cielo Soc. Agr. Coop. - Arcevia (AN)

Le Zolle srl - Roma

Terra di Resilienza Cooperativa sociale arl Morigerati (SA)

Seed Vicious APS - Scandicci (FI)

Seminati - Marcon (VE)

Smarties.bio srl Società Agricola - Chioggia (VE)

Terra! APS - Roma

WWOOF Italia - Lavoratori Volontari nelle Fattorie Biologiche - Castagneto Carducci (LI)

Why on farm?

- Assessment G X E X M interactions
- Assessment of plant/plant (intervarieties and interspecies diversity) and plant/soil interaction
- Farmers' preferences
- Farmers' and citizens' engagements (field days, apps ecc)
- Data on abiotic / biotic stress resistances in real-world conditions
- Correlations with existing databases on genotyping and feeding data to genomic prediction models
- Correlation with climatic data/models (e.g. worldclim, climate analogues) to evaluate adaptation with relation to climate changes

Broadening the scope of breeding programs to include functional biodiversity and evolutionary ecology concepts

Enhancing functional biodiversity at multiple scales

Integrating the variety of pesticide-free practices and the environmentinbreeding

Broadening the scope of breeding by integrating interactions with soil and microorganisms

Agronomy for Sustainable Development (2022) 42: 8
https://doi.org/10.1007/s13593-021-00742-8

REVIEW ARTICLE

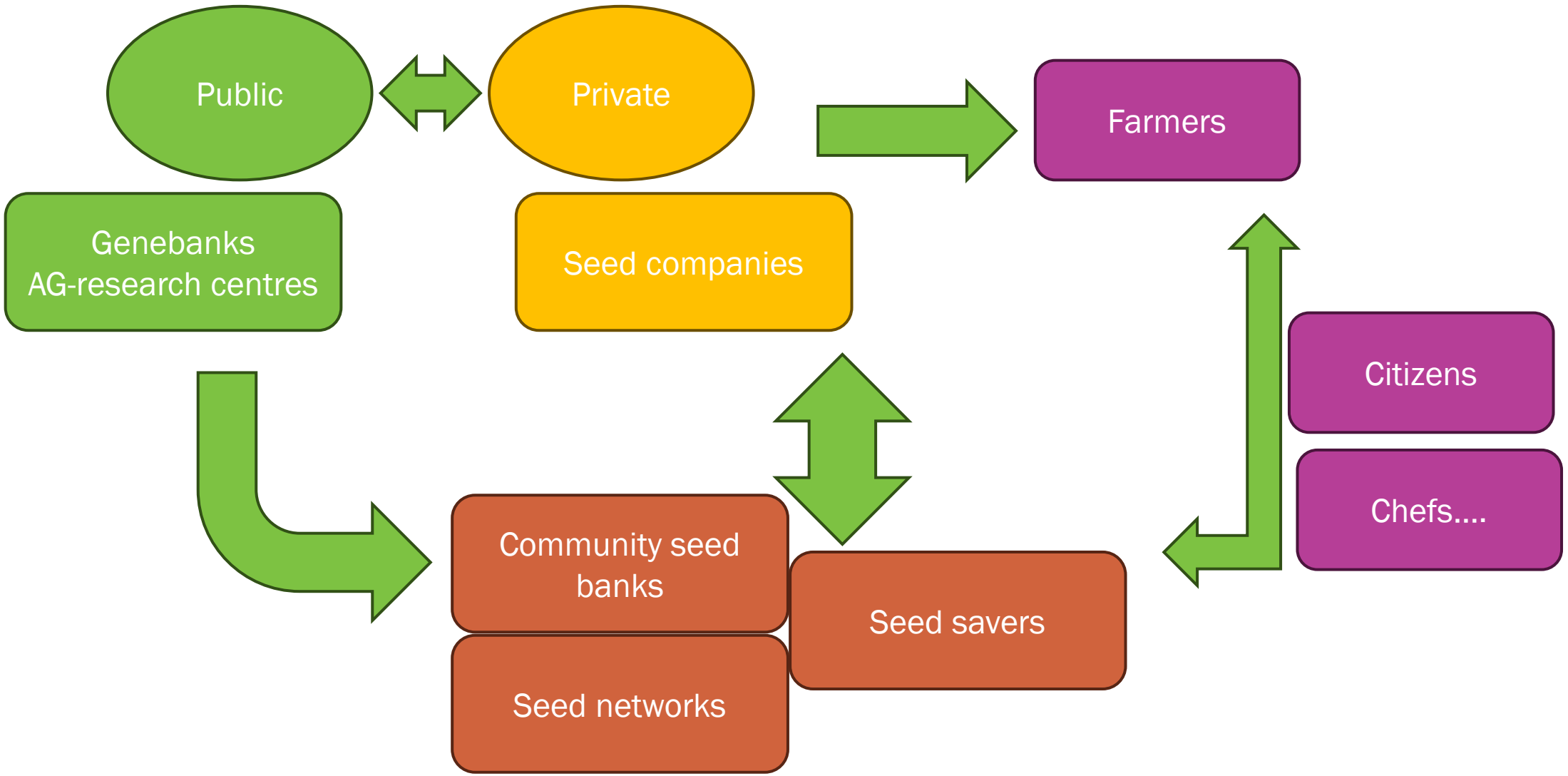
Check for updates

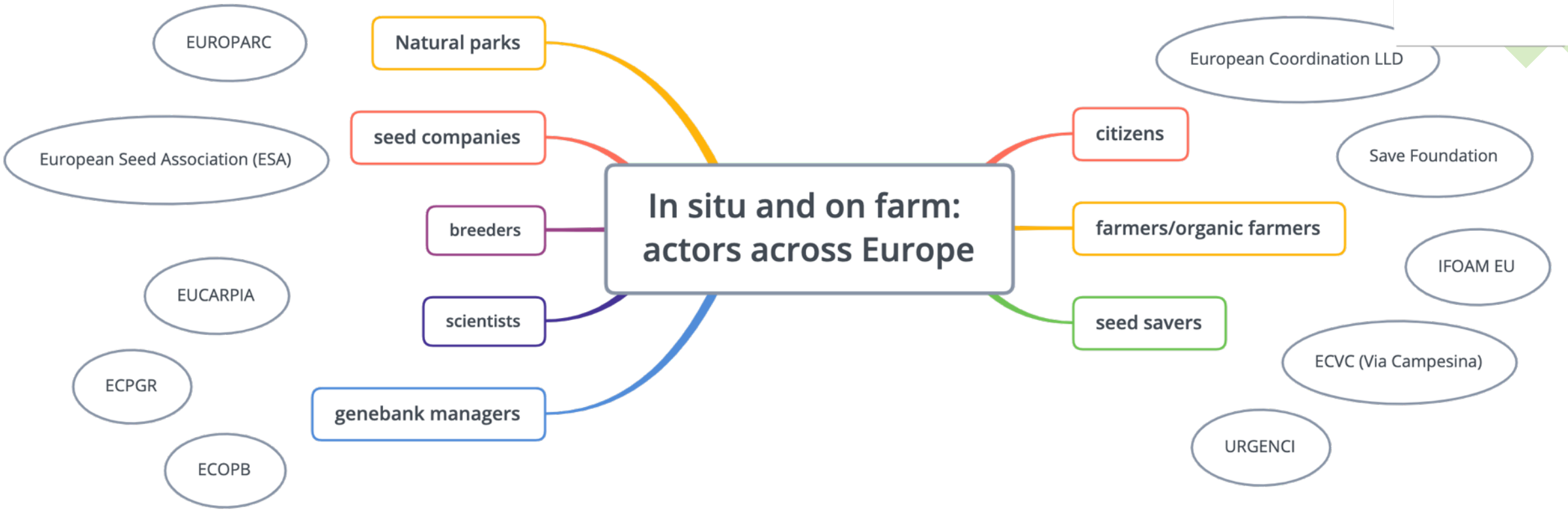
Pesticide-free agriculture as a new paradigm for research

Florence Jacquet[1] · Marie-Hélène Jeu roy[2] · Julia Jouan[1] · Edith Le Cadre[3] · Isabelle Litrico[4] · Thibaut Malausa[5] · Xavier Reboud[6] · Christian Huyghe[7]

Accepted: 8 November 2021 / Published online: 27 January 2022

What are private actors?


Public
Private
Farmers
Genebanks
AG-research centres
Seed companies
Citizens
Chefs....
Community seed banks
Seed savers
Seed networks


In situ and on farm: actors across Europe
Natural parks
seed companies
breeders
scientists
genebank managers
citizens
farmers/organic farmers
seed savers
EUROPARC
European Seed Association (ESA)
EUCARPIA
ECPGR
ECOPB
European Coordination LLD
Save Foundation
IFOAM EU
ECVC (Via Campesina)
URGENCI

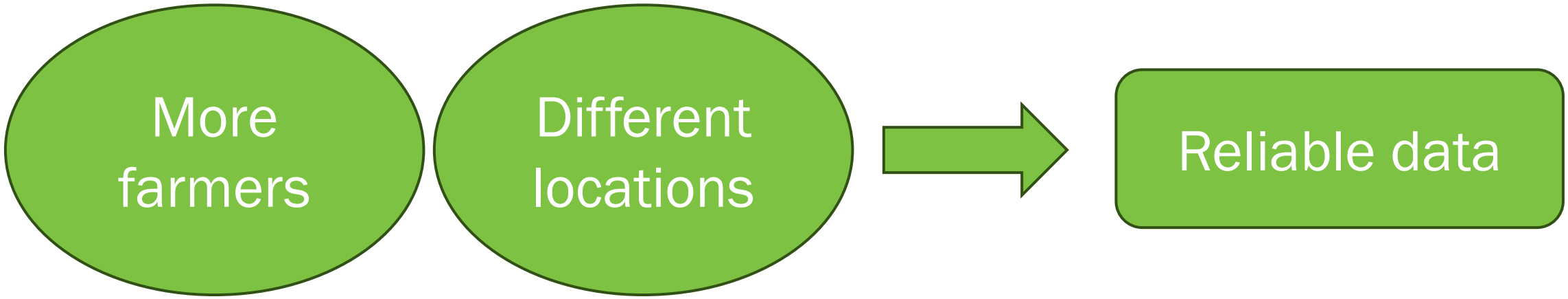
What kind of material we are phenotyping?

- Diverse varieties
- Populations
- Landraces

HOW?

PRO-GRACE
PROMOTING A PLANT GENETIC RESOURCE COMMUNITY FOR EUROPE

Citizens/farmers science approach

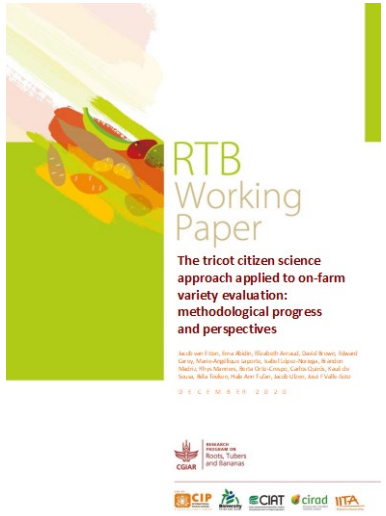


Expl Agric. (2019), volume 55 (S1), pp. 275–296 © *Cambridge University Press 2016.*

doi:10.1017/S0014479716000739

FIRST EXPERIENCES WITH A NOVEL FARMER CITIZEN SCIENCE APPROACH: CROWDSOURCING PARTICIPATORY VARIETY SELECTION THROUGH ON-FARM TRIADIC COMPARISONS OF TECHNOLOGIES (TRICOT)

By JACOB VAN ETTEN†‡‡‡‡‡, ESKENDER BEZA‡, LLUÍS CALDERER†, KEES VAN DUIJVENDIJK§, CARLO FADDA¶, BASAZEN FANTAHUN††, YOSEF GEBREHAWARYAT KIDANE¶‡‡, JESKE VAN DE GEVEL§§, ARNAB GUPTA¶¶, DEJENE KASSAHUN MENGISTU†††, DAN KIAMBI‡‡‡, PREM NARAIN MATHUR¶¶, LEIDA MERCADO§§§, SARIKA MITTRA¶¶ ¶¶¶, MARGARET J. MOLLEL††††, JUAN CARLOS ROSAS‡‡‡‡, JONATHAN STEINKE†§§§§, JOSE GABRIEL SUCHINI¶¶¶¶ *and* KARL S. ZIMMERER†††††



Gamification of farmer-participatory priority setting in plant breeding: Design and validation of "AgroDuos"

Jonathan Steinke[a,b] and Jacob van Etten[a]

[a]Bioversity International, CATIE, Turrialba, Costa Rica; [b]Department of Agricultural Economics, Division of Horticultural Economics, Humboldt-Universität zu Berlin, Berlin, Germany

ABSTRACT

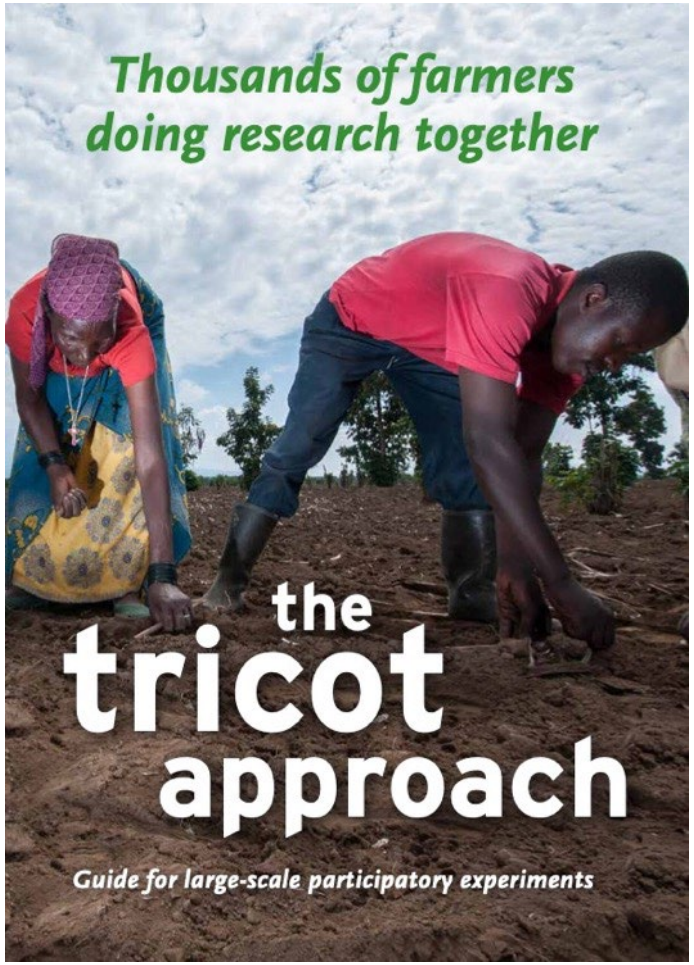
Participatory methods to characterize farmers' needs and preferences play an important role in plant breeding to ensure that new varieties fulfill the needs and expectations of end users. Different farmer-participatory methods for priority setting exist, each one responding differently to trade-offs between various requirements, such as replicability, simplicity, or granularity of the results. All available methods, however, require training, academic skill, and staff time of specially qualified professionals. Breeding and variety replacement may be accelerated by empowering non-academic organizations, such as NGOs and farmer organizations, to carry out farmer-participatory priority setting. But for this use context, currently no suitable method is available. A new method is needed that demands relatively low skill levels from enumerators and respondents, engages farmers without the need for extrinsic incentives, and gives statistically robust results. To achieve these objectives, we followed principles of "gamification" in the design of AgroDuos, a choice experiment that resembles a card game and that involves pairwise ranking of variety traits. We tested the method in a pilot with 39 farmers in Honduras to define their trait priorities for common bean (*Phaseolus vulgaris* L.). To validate our results, we independently carried out conjoint analysis, an established method for priority setting in plant breeding. We found that AgroDuos produced valid and useful results while enabling rapid, easy, and engaging data collection. Challenges persist concerning local adaptation and data analysis by non-specialist staff, which may be resolved in the future by providing templates and online support.

ARTICLE HISTORY
Received 18 January 2017
Accepted 5 March 2017

KEYWORDS
Citizen science; conjoint analysis; farmer preferences; gamification; Honduras; plant breeding; priority setting

Introduction

The use of farmer-participatory methods in plant breeding is now widely established, although not standard practice everywhere (Ceccarelli, Guimarães, and Weltzien 2009). Given continuously changing pressures on farming and the immense diversity of farmers' needs and preferences, participatory methods promise to accelerate breeding and increase adoption of



The All-in-One Trialing Platform

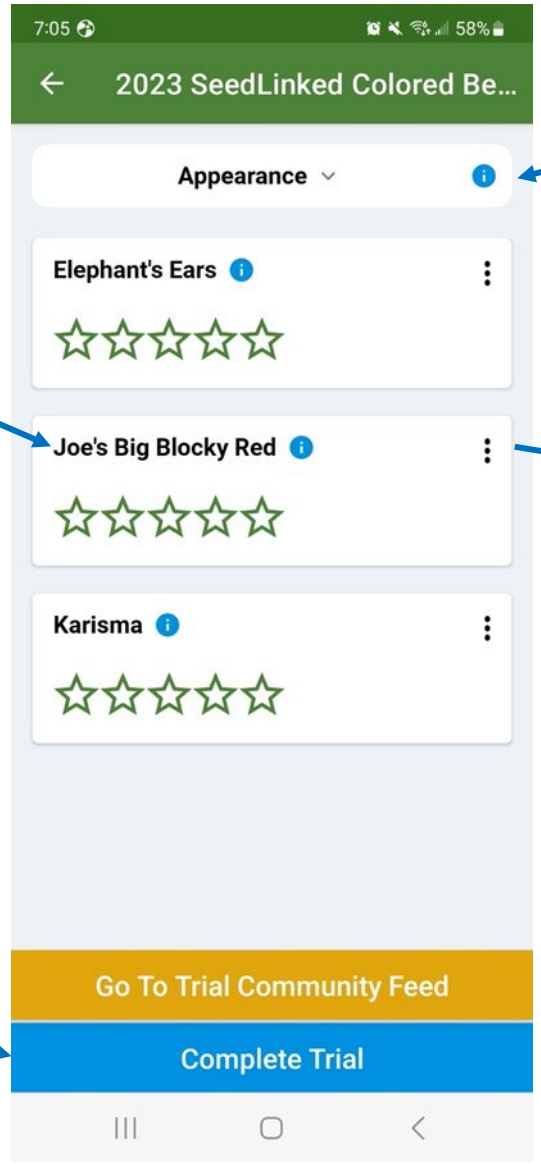
SeedLinked

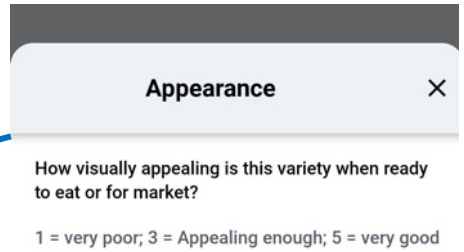
- Trial management
- Data collection
- Communication
- Real-time insights sharing
- Digital presence

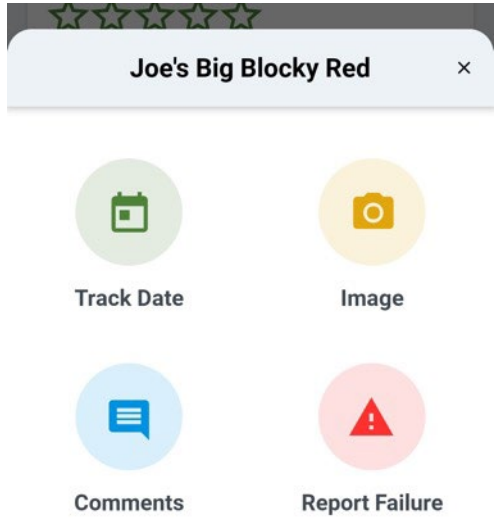
Mobile apps

ANDROID APP ON Google Play

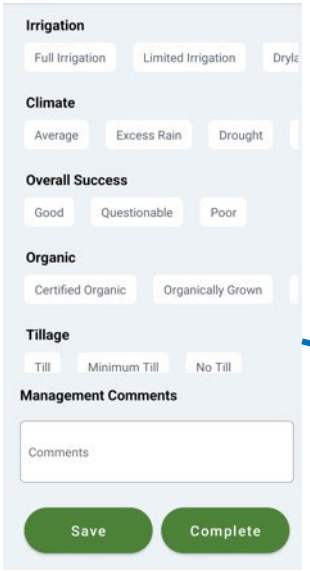
AVAILABLE ON THE App Store







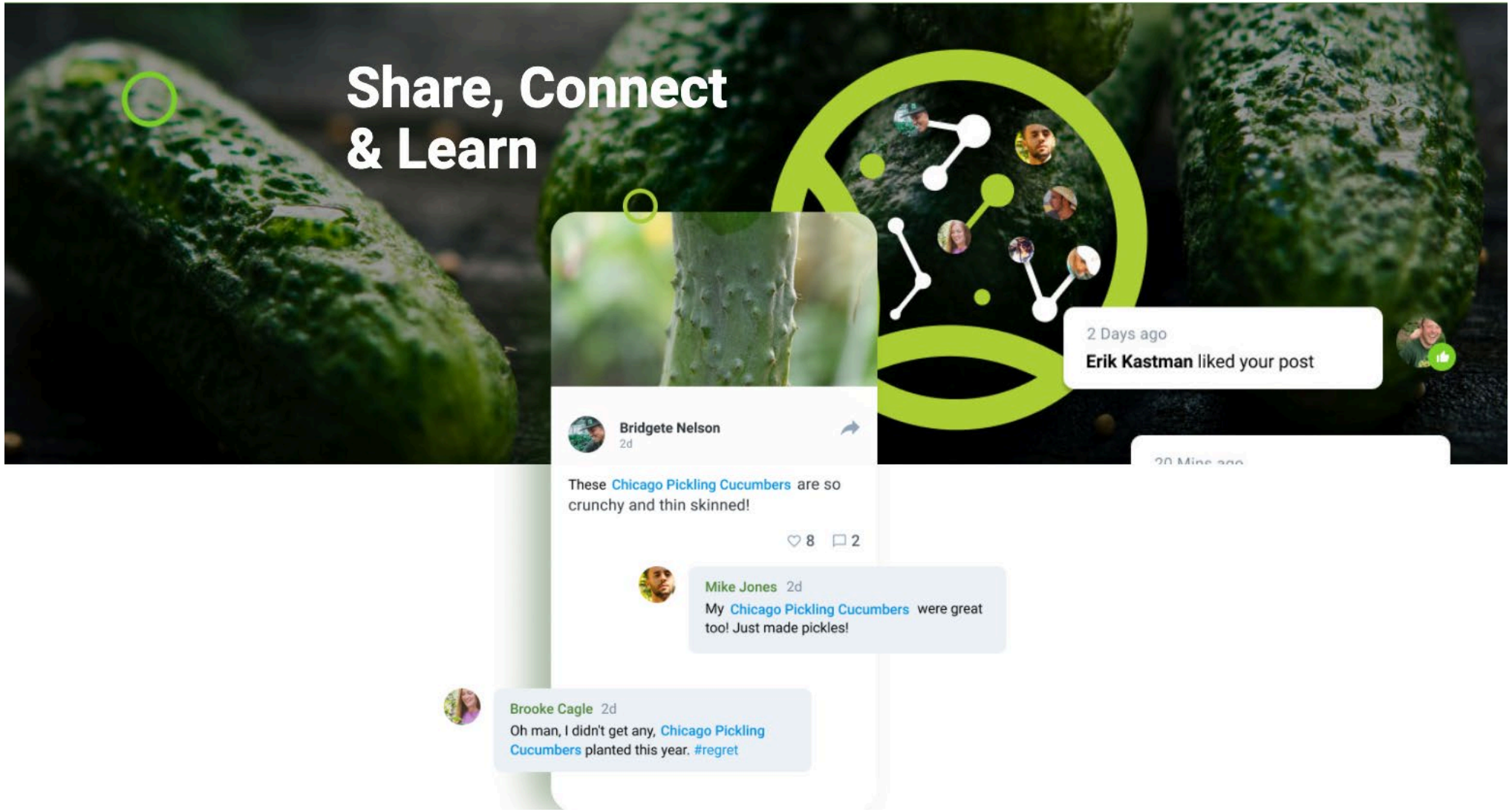
Ask question, share what you see…



Off Line mode!

AVAILABLE ON THE
App Store

ANDROID APP ON
Google Play

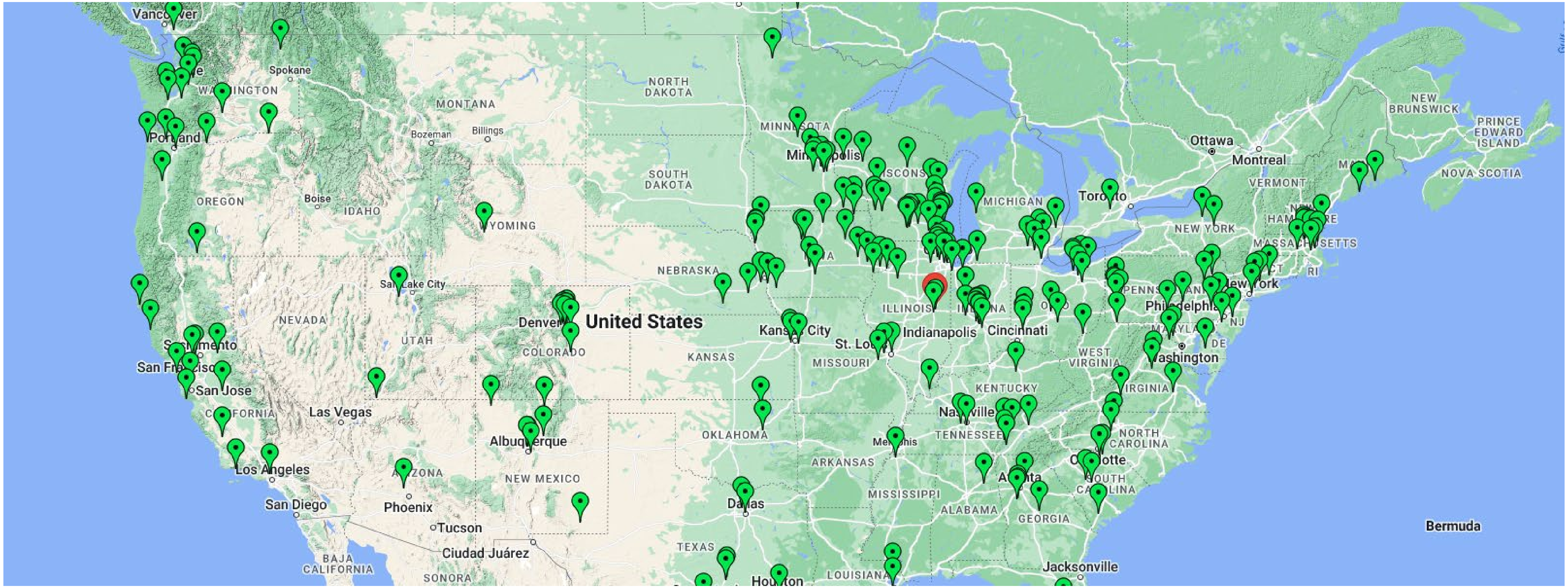


PRO-GRACE
PROMOTING A PLANT GENETIC RESOURCE COMMUNITY FOR EUROPE

A lettuce trial example

- 8 trialed accession from seed banks
- 230 growers
- Live results here
- Accession page example

Seed Savers EXCHANGE


Spokane
MONTANA
Bozeman
Billings
NORTH DAKOTA
SOUTH DAKOTA
OREGON
Boise
IDAHO
NEBRASKA
United States
NEVADA
UTAH
COLORADO
KANSAS
San Jose
Las Vegas
OKLAHOMA
NEW MEXICO
Los Angeles
San Diego
Phoenix
Tucson
Ciudad Juárez
BAJA CALIFORNIA
SONORA
TEXAS
ARKANSAS
MISSISSIPPI
LOUISIANA
ALABAMA
GEORGIA
TENNESSEE
KENTUCKY
Indianapolis
Cincinnati
WEST VIRGINIA
NORTH CAROLINA
Jacksonville
MICHIGAN
NEW YORK
VERMONT
Ottawa
Montreal
NEW BRUNSWICK
PRINCE EDWARD ISLAND
NOVA SCOTIA
Bermuda

230 growers

2023 ADAPT Romaine Lettuce Trial

Lettuce | Seed Savers Exchange | Sub-Set

In order to expand the number of Romaine lettuces offered in our catalog, Seed Savers Exchange is trialing several varieties from the seed collection this year. Ranging in color from “blonde” to green to red, these varieties will add some crunch to your summer salad. You will be sent 3 varieties to evaluate throughout the season. Lettuce is typically started indoors and then transplanted into the garden. If you’re limited on space, lettuce also grows well in containers – their shallow roots don’t require deep soil. Seeds will be shipped the week of February 27th. The results of this trial will help us decide which collection varieties to include in future catalogs!

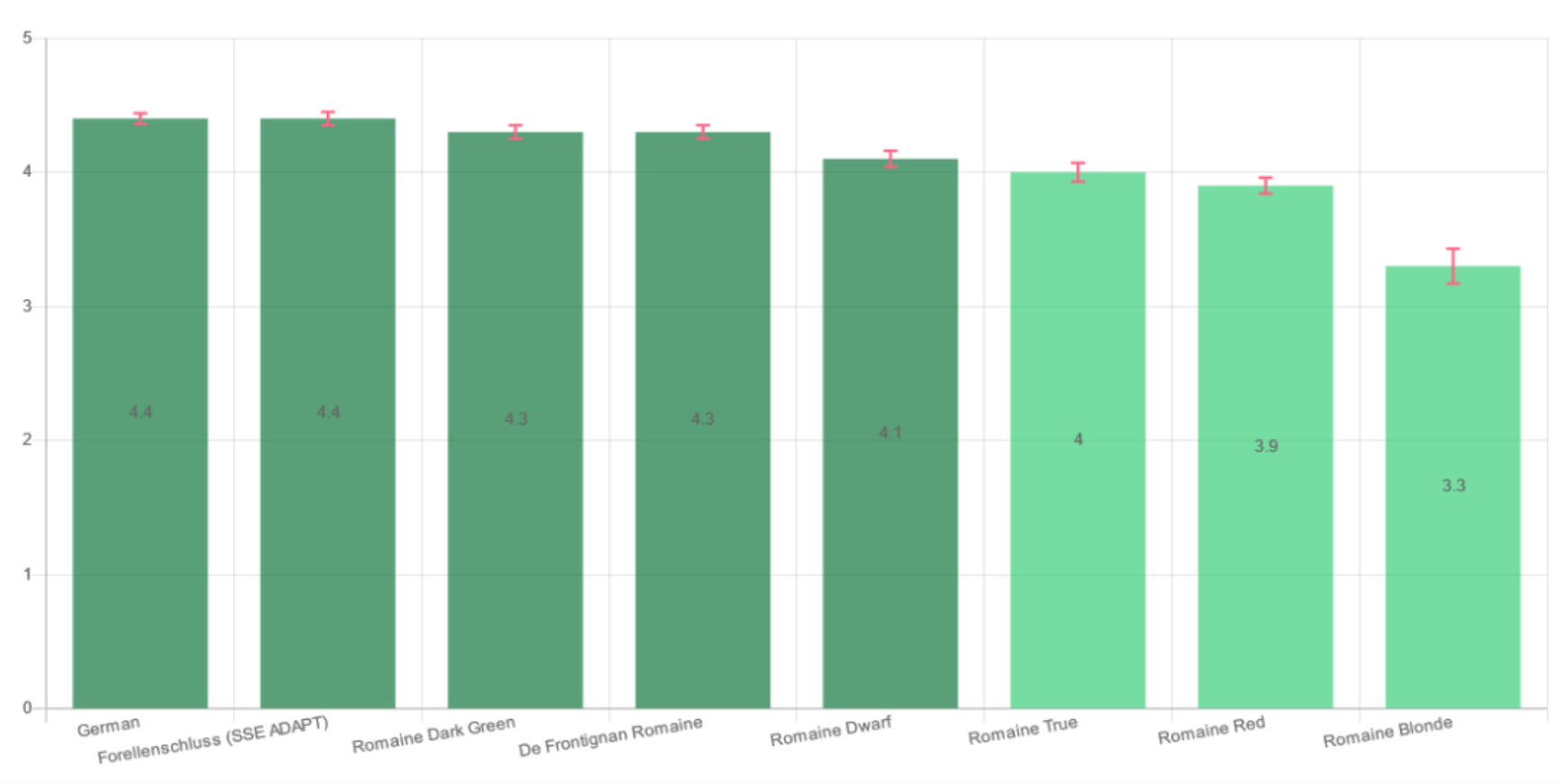
228 **Growers**

Farmers **(15)** | Trial Manager **(4)** | Gardeners **(209)**

45% **Participation**

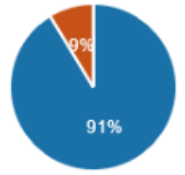
Planted **(116)** | Reviewed **(103)** | Harvested **(59)**

Select Traits | Roles | Hardiness Zone | Select Varieties

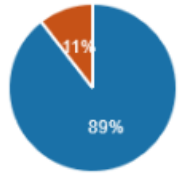


Would you like to grow this again?

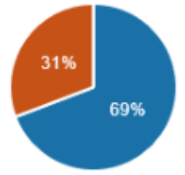
Yes | No | Not Available



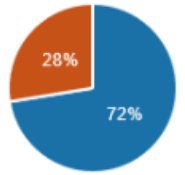
German



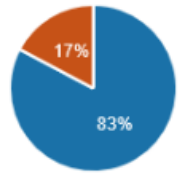
Forellenschluss (SSE ADAPT)

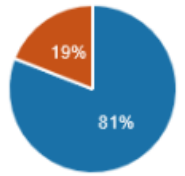


Romaine Dark Green

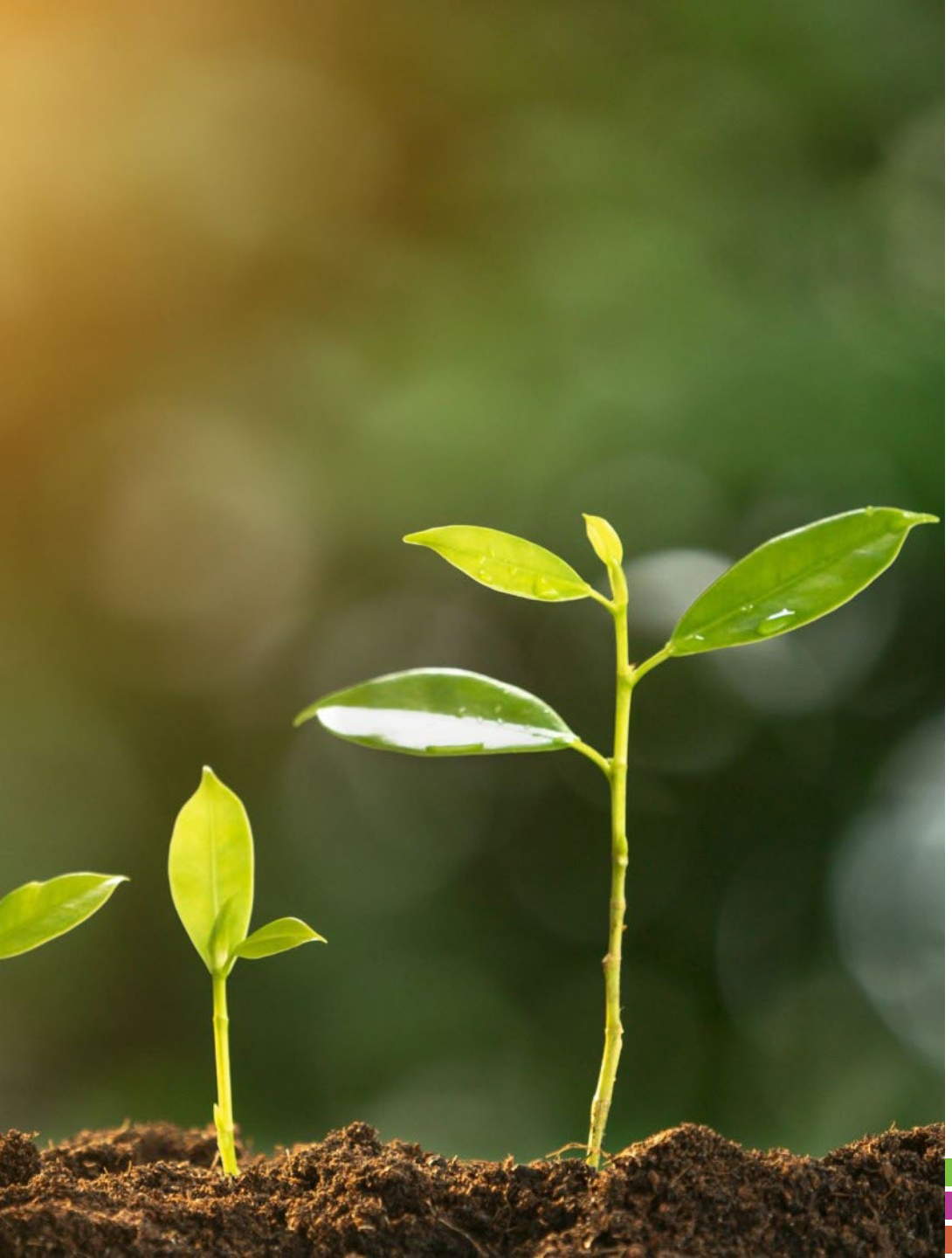


De Frontignan Romaine





Cost effective?



Low cost

- 650 growers
- 5,400 plots
- 2.8 Trials per grower
- $20 per grower (include staff to pack)
- $8,500 platform cost
- **Cost per plot: $4**
- **Regular >$100/plot**

Resource-limited project made possible

- Low growing and data collection cost
- Multi locations testing at low cost, & diversity of opinions
- Data stored in the cloud, accessible at all times, export/API to DB
- Data fully connected for best visibility and adoption

Benefits

- Low-cost trialing
- High grower engagement
- Live results sharing to all stakeholders
- Fully connected insight
- Searchable insights (Open source data)

PRO-GRACE

PROMOTING A PLANT GENETIC RESOURCE COMMUNITY FOR EUROPE

Funded by the European Union

THANK YOU

Riccardo Bocci

Riccardo.bocci@semirurali.net

www.rsr.bio