AGROECOLOGY FOR WEEDS

UNA RED DE MANEJO AGROECOLÓGICO DE ESPECIES ARVENSES PARA LA PROMOCIÓN DE LA ADOPCIÓN DE ESTRATEGIAS SOSTENIBLES DE MANEJO DE ESPECIES ARVENSES

Taller nacional
en España

Nuria Ferreiro Domínguez, Francisco Javier Rodríguez Rigueiro, Ana Couso Viana, Jose Javier Santiago Freijanes, María Rosa Mosquera Losada
Universidad de Santiago de Compostela

23 / 04 / 2026

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Veamos qué ocurrió en el Living Lab de VIÑEDO de Galicia

… en 3 campañas experimentales

Nuestro Laboratorio Vivo

- Portomarín, Lugo (Coordenadas: 42°48’47.9"N 7°36’36.1“W)

GOOD AGROECOLOGY FOR WEEDS

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1 AÑO

First year, Option agreed, at least

1.- First year: Sowing the tree corridors with at least three cover crop species (legume, grass, cereal...) under organic and conventional management benchmarked with mechanical weeding and herbicides application as reference treatments for organic and conventional management, respectively + weedy (5 different treatment for the corridor management in total)

1.- Organic
3 cover crops in the corridors under organic management

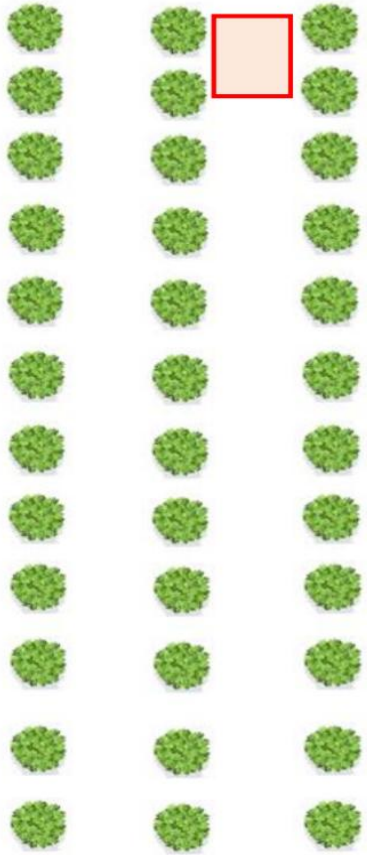
2.- Conventional
3 cover crops in the corridors under conventional management

3.- Mechanical weeding in corridors (organic)

4.- Herbicides application in corridors (conventional)

5.- Weedy under organic and conventional management.

In total 10 treatments.



Second and third years

2a.- 2nd and 3rd year: Sowing the corridors with the selected species (legume, grass, cereal...) as an accompanion of the perennial crop and combine with step 2b.

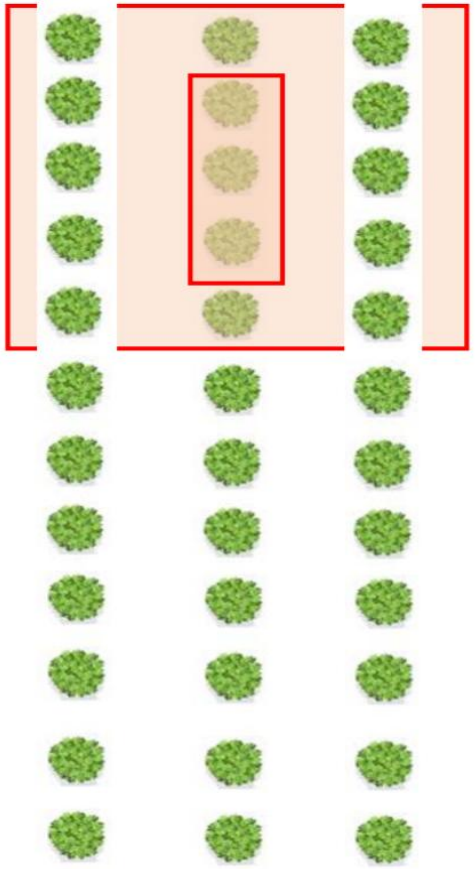
2b.- 2nd and 3rd year Combines with step 2ª. Use different AWM in the perennial crops line (selecting: 3 practices in organic sites/5 practices in conventional sites) from those below:

2.1.Weedy

2.2.Herbicide
- 2.2.1- Herbicide full rate
- 2.2.2. Reduced herbicide rate
- 2.2.3 Site-specific spraying

2.3. Cultural:
- 2.3.1 Intercropping
- 2.3.2. Bio-based herbicides
- 2.3.3 Grazing

2.4. Mechanical practices
- 2.4.1.-Mowing
- 2.4.2.- Mannual weeding
- 2.4.3. Organic Mulch
- 2.4.4 Plastic



Experimental unit

Each experimental unit has to be repeated at least three times

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1

AÑO

TAMAÑO DE LAS PARCELAS 1 m² (TRES RÉPLICAS)

FECHA DE SIEMBRA: 11 OCTUBRE 2023

Mezcla 1. DICOTILEDÓNEAS

Raphanus sativus var. Triangel: dosis 15 kg ha^{-1}

Brassica carinata var. Utopía: dosis 10 kg ha^{-1}

Brassica juncea variedad Brown: dosis 10 kg ha^{-1}

Eruca sativa var. Tiara: dosis 5 kg ha^{-1}

Mezcla 2. LEGUMINOSAS

Trifolium repens var. Asgard: dosis 15 kg ha^{-1}

Trifolium pratense var. Lucrum: dosis 15 kg ha^{-1}

Trifolium subterraneum var. Dalkeith: dosis 10 kg ha^{-1}

Mezcla 3. GRAMÍNEAS

Lolium perenne var Bijou: dosis 15 kg ha^{-1}

Lolium multiflorum var. Locobelo: dosis 15 kg ha^{-1}

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CONVENCIONAL

2 AÑO

Tres filas, cada fila con cinco plantas

CALLES	FILAS
Cultivo de Cobertera con Inóculo	Acolchado
Cultivo de Cobertera con Inóculo	Siega
Cultivo de Cobertera con Inóculo	Cultivo intercalado con trébol
Cultivo de Cobertera con Inóculo	Herbicida (dosis completa)
Cultivo de Cobertera con Inóculo	Herbicida (dosis media)
Cultivo de Cobertera sin Inóculo	Acolchado
Cultivo de Cobertera sin Inóculo	Siega
Cultivo de Cobertera sin Inóculo	Cultivo intercalado con trébol
Cultivo de Cobertera sin Inóculo	Herbicida (dosis completa)
Cultivo de Cobertera sin Inóculo	Herbicida (dosis media)
Sin siembra	Acolchado
Sin siembra	Siega
Sin siembra	Cultivo intercalado con trébol
Sin siembra	Herbicida (dosis completa)
Sin siembra	Herbicida (dosis media)

Fecha de siembra: noviembre 2024
Tratamientos filas: marzo / abril 2025

CULTIVO DE COBERTERA: Trébol subterráneo (10 kg/ha), Trébol blanco (15 kg/ha), Trébol violeta (15 kg/ha), Ryegrass italiano (7.5 kg/ha), Ryegrass inglés (7.5 kg/ha)

Abril 2025: fertilización de los cultivos de cobertera con 60 kg/ha of P_2O_5 y 60 kg/ha of K_2O

GOOD AGROECOLOGY FOR WEEDS

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ECOLÓGICO

2 AÑO

Tres filas, cada fila con cinco plantas

CALLES	FILAS
Cultivo de Cobertera con Inóculo	Acolchado
Cultivo de Cobertera con Inóculo	Siega
Cultivo de Cobertera con Inóculo	Cultivo intercalado con trébol
Cultivo de Cobertera sin Inóculo	Acolchado
Cultivo de Cobertera sin Inóculo	Siega
Cultivo de Cobertera sin Inóculo	Cultivo intercalado con trébol
Sin siembra	Acolchado
Sin siembra	Siega
Sin siembra	Cultivo intercalado con trébol

Fecha de siembra: noviembre 2024
Tratamientos filas: marzo / abril 2025

CULTIVO DE COBERTERA: Trébol subterráneo (10 kg/ha), Trébol blanco (15 kg/ha), Trébol violeta (15 kg/ha), Ryegrass italiano (7.5 kg/ha), Ryegrass inglés (7.5 kg/ha)

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2

AÑO

CONVENCIONAL Y ECOLÓGICO

MUESTREOS DE SUELO: diciembre 2024

PRODUCCIÓN Y BIODIVERSIDAD: mayo 2025 (calles y filas)

RAÍCES Y SUELO INNOCULACIÓN: junio 2025

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2

AÑO

CONVENCIONAL Y ECOLÓGICO

VENDIMIA: septiembre 2025

Producción

Ácido L-málico

NFA

Grado alcohólico probable

Acidez total

Ácido tartárico

Grado Brix

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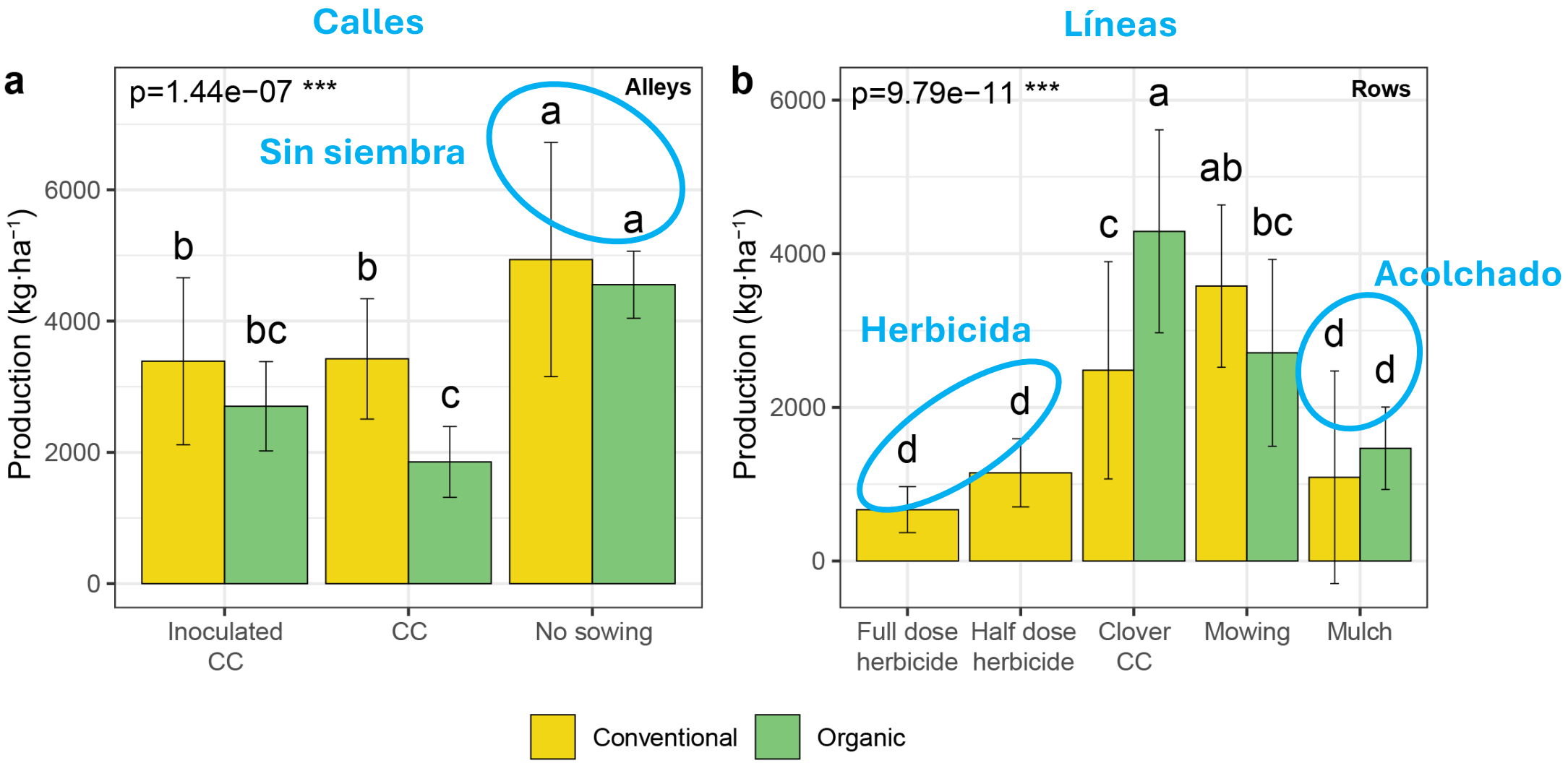
2

AÑO

PRODUCCIÓN (CONVENCIONAL Y ECOLÓGICO)



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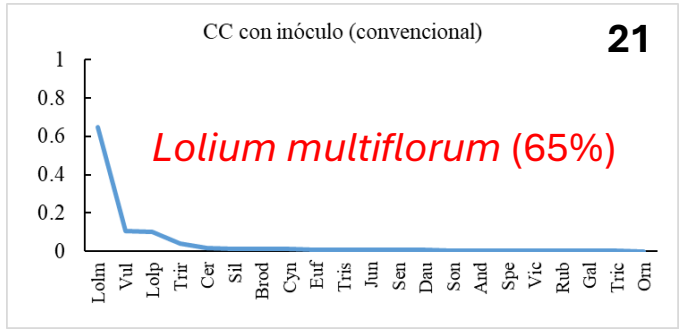
2

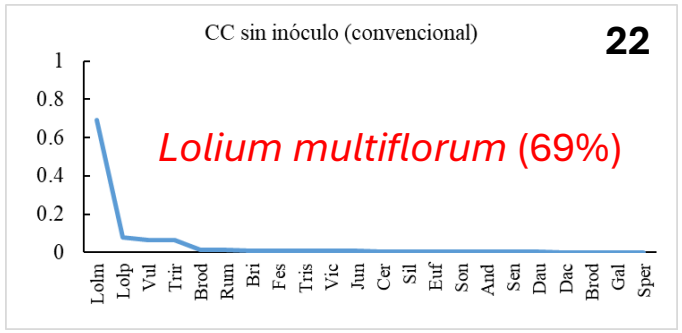
BIODIVERSIDAD (CONVENCIONAL)

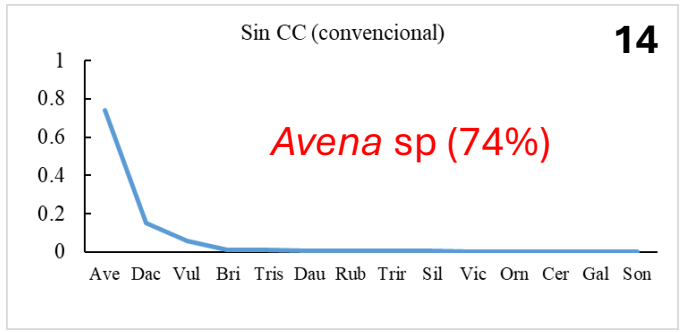
AÑO

Calles

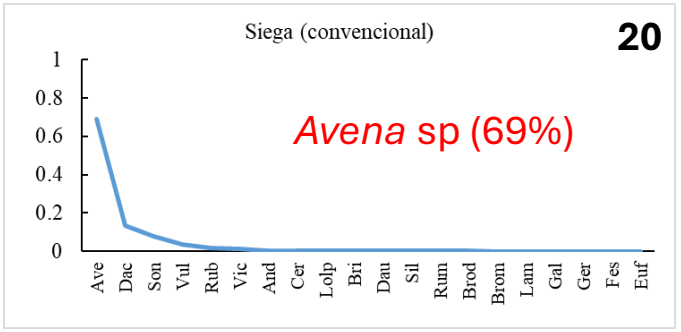
CC + sp

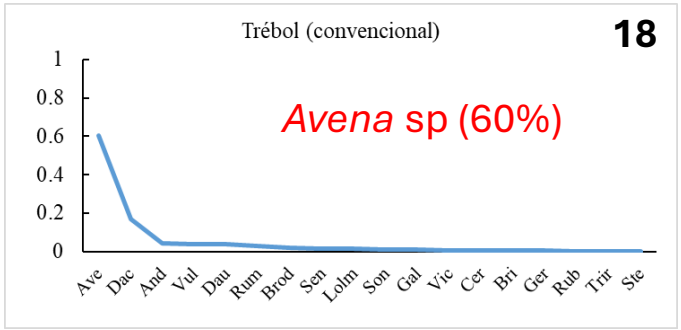


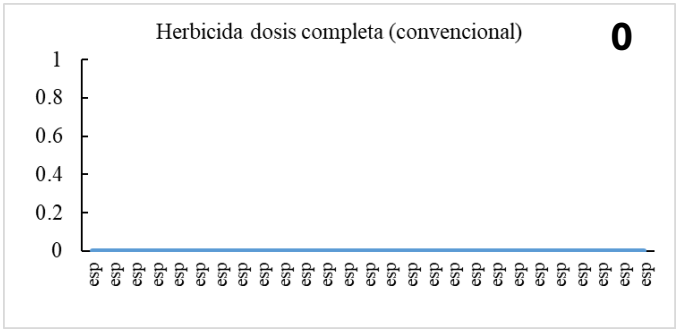


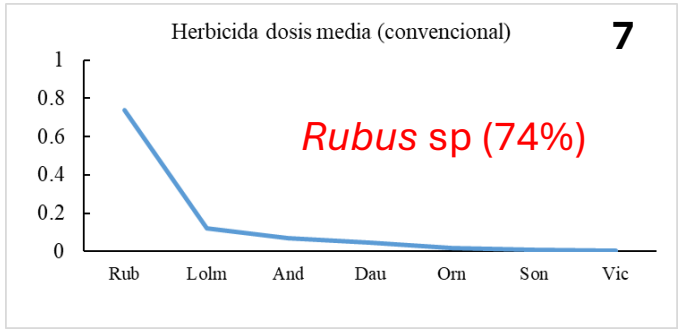


Líneas









Acolchado:
producción similar al herbicida, pero más biodiversidad

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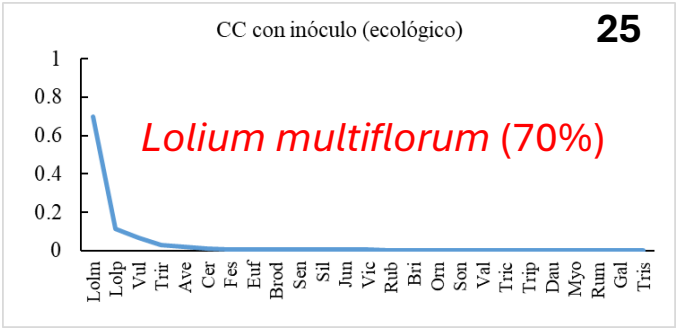
2

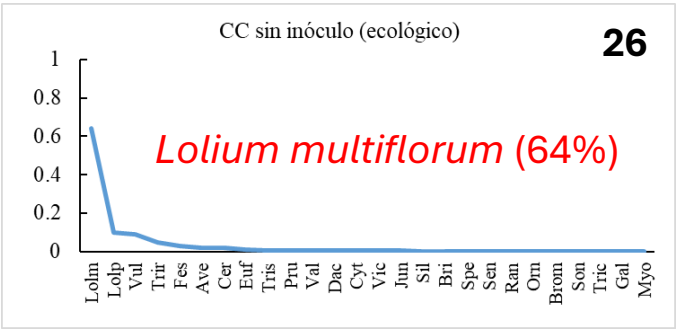
BIODIVERSIDAD (ECOLÓGICO)

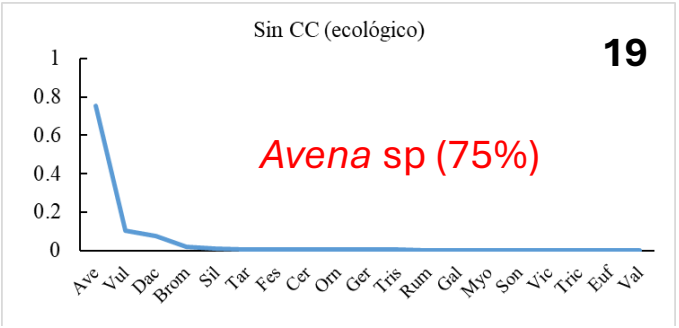
AÑO

CC + sp

Calles







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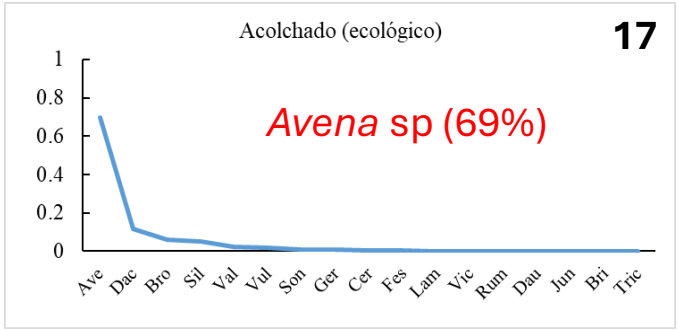

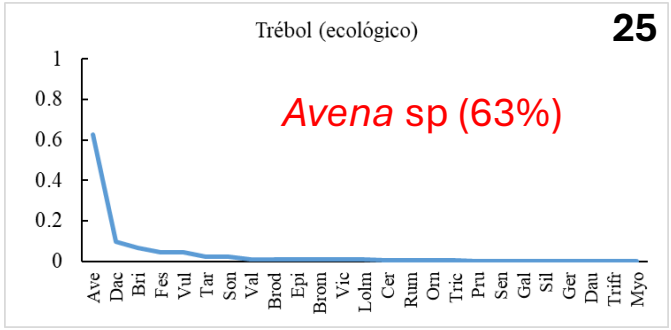

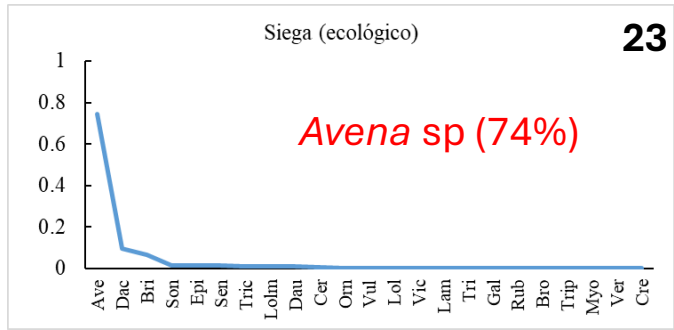

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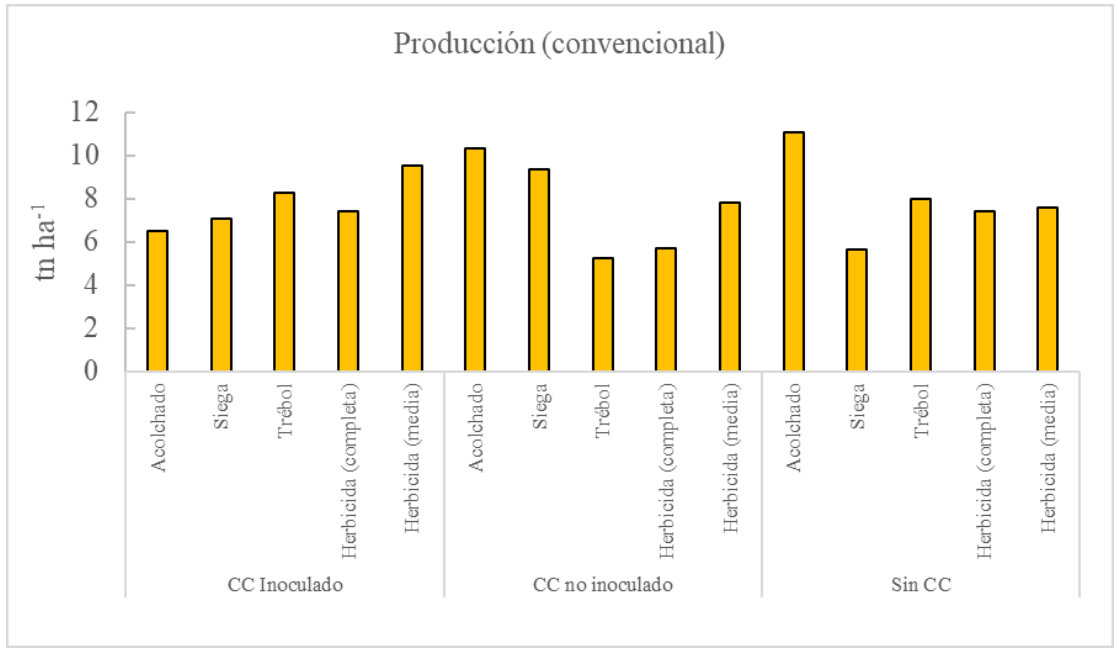
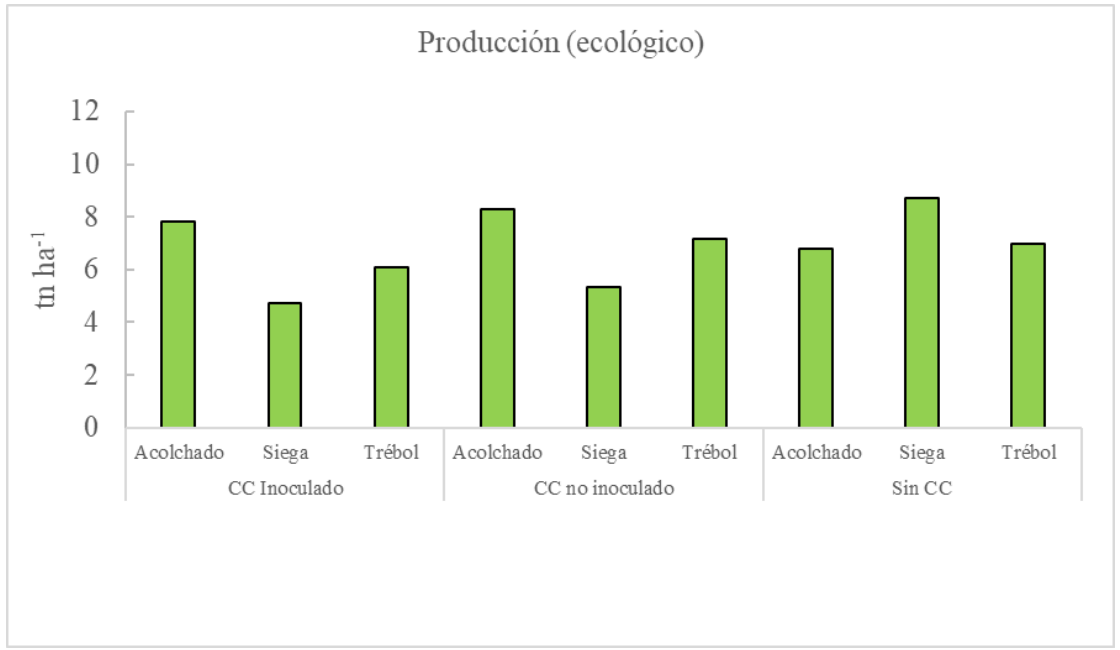
2

AÑO

PRODUCCIÓN UVA (CONVENCIONAL Y ECOLÓGICO)





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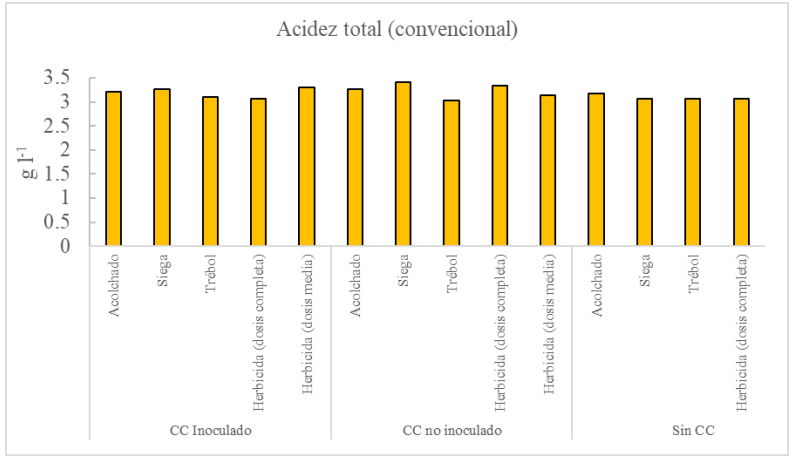
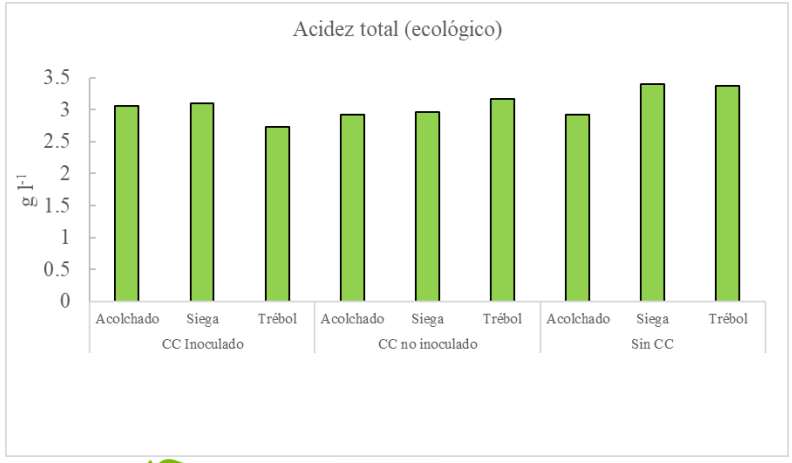
PROPIEDADES DE LA UVA (CONVENCIONAL Y ECOLÓGICO)

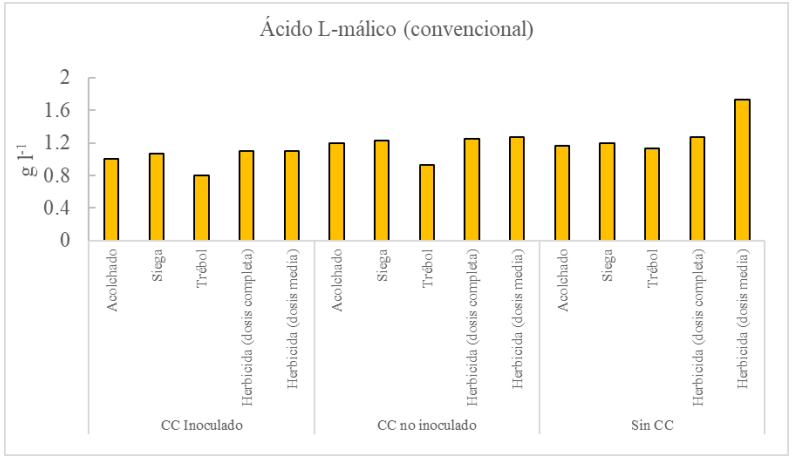
2 AÑO

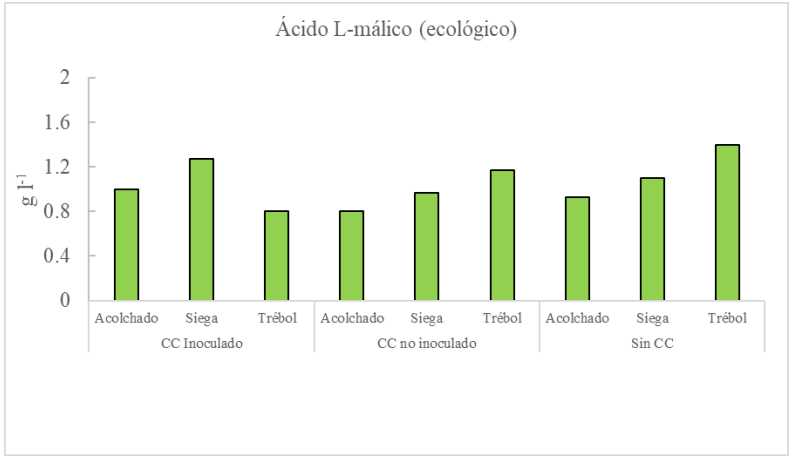
Acidez total



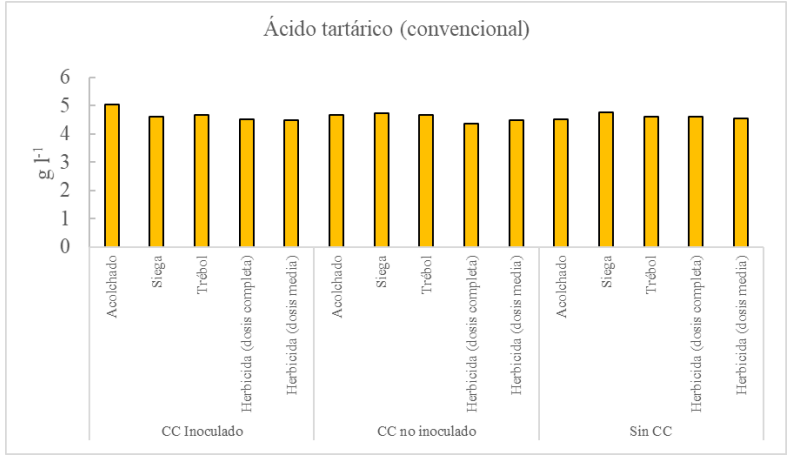


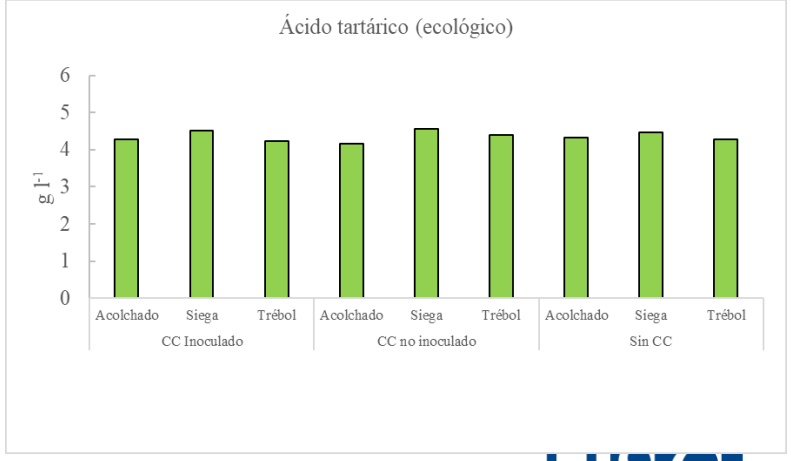
Ácido L-málico





Ácido tartárico





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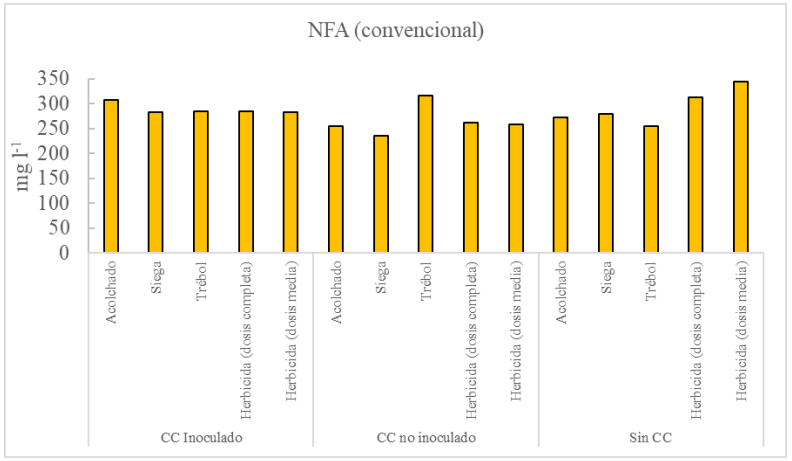
2 AÑO — PROPIEDADES DE LA UVA (CONVENCIONAL Y ECOLÓGICO)

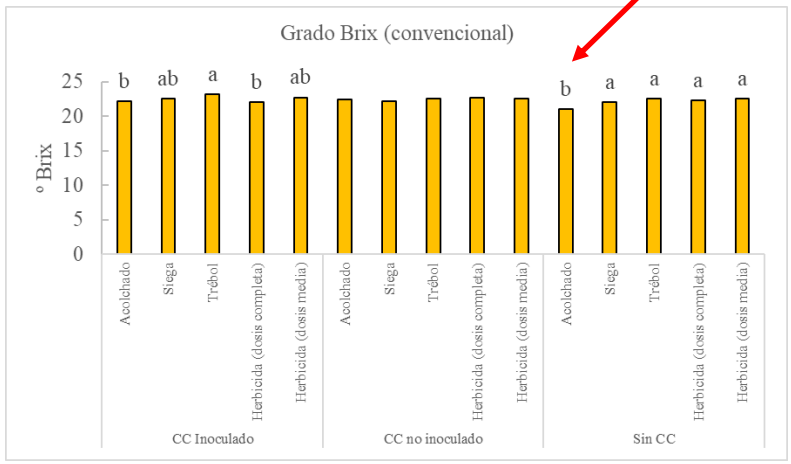
- Acolchado

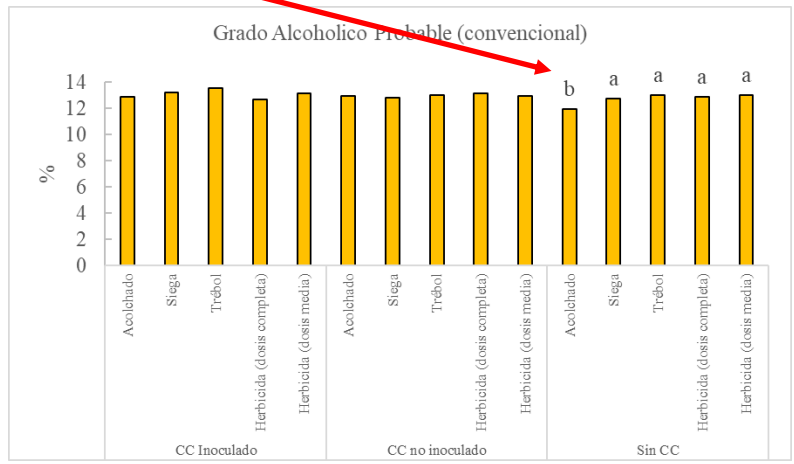
NFA

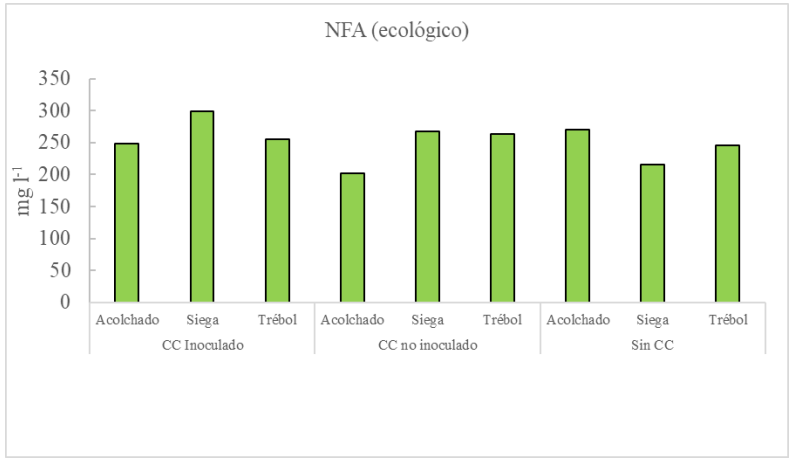
Grado Brix

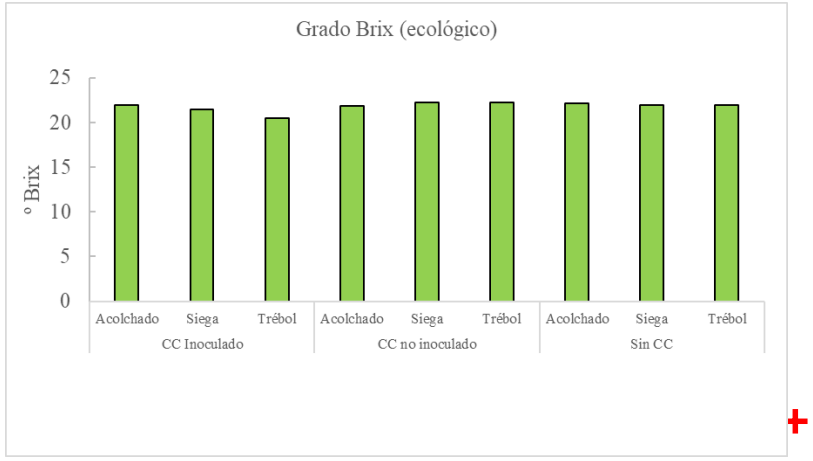
Grado Alcohólico Probable

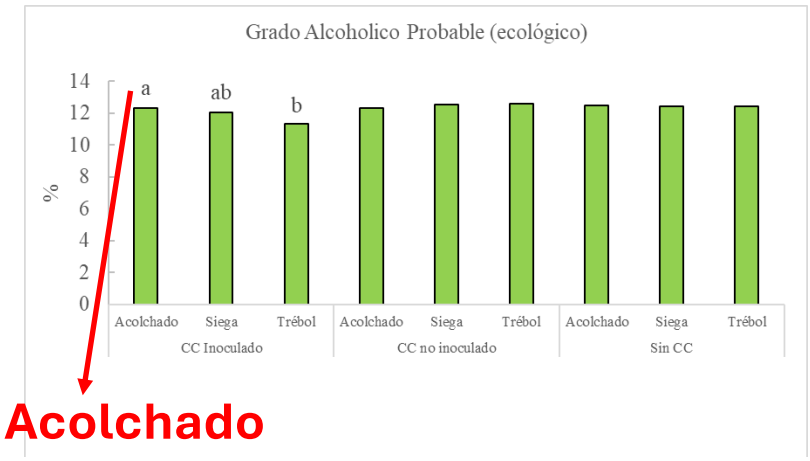












+ Acolchado

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3

AÑO

CONVENCIONAL Y ECOLÓGICO

RESIEMBRA DE LAS CALLES CON Y SIN INÓCULO: octubre 2025

APLICACIÓN DE LOS TRATAMIENTOS EN LAS LÍNEAS: abril 2026

FERTILIZACIÓN CULTIVOS COBERTERA (CONVENCIONAL): abril 2026

RAÍCES Y SUELO INNOCULACIÓN: abril 2026

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CONCLUSIONES

- ✓ Los cultivos de cobertera reducen la producción e incrementan la biodiversidad en las calles, independientemente de si han sido inoculados o no.

- ✓ El uso de acolchado con paja presenta un efecto similar al de los herbicidas sobre la producción de pasto en las líneas del cultivo, pero con mayor biodiversidad.

- ✓ En cuanto a la producción del cultivo principal, hasta el momento no se ha observado un efecto claro de los tratamientos. Por ello, es necesario continuar la evaluación durante el tercer año de estudio, con el fin de obtener resultados más concluyentes y determinar con mayor precisión su impacto.

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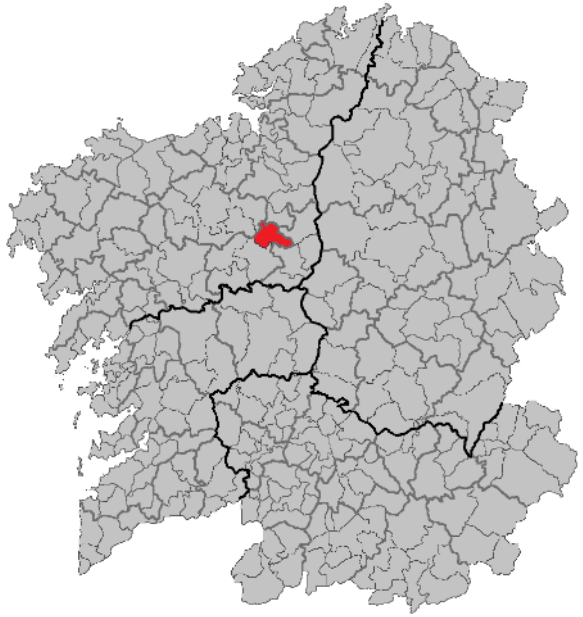
Veamos qué ocurrió en el Living Lab de MANZANO de Galicia

… en 3 campañas experimentales

Nuestro Laboratorio Vivo

- As Corredoiras, Boimorto (Coordenadas: 43°00,68456"N; 8°05,98318“W)



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USC UNIVERSIDADE DE SANTIAGO DE COMPOSTELA

CONVENCIONAL

2 AÑO

Tres filas, cada fila con cinco árboles

CALLES	FILAS
Cultivo de Cobertera con Inóculo	Acolchado
Cultivo de Cobertera con Inóculo	Siega
Cultivo de Cobertera con Inóculo	Cultivo intercalado con trébol
Cultivo de Cobertera con Inóculo	Herbicida (dosis completa)
Cultivo de Cobertera con Inóculo	Herbicida (dosis media)
Cultivo de Cobertera sin Inóculo	Acolchado
Cultivo de Cobertera sin Inóculo	Siega
Cultivo de Cobertera sin Inóculo	Cultivo intercalado con trébol
Cultivo de Cobertera sin Inóculo	Herbicida (dosis completa)
Cultivo de Cobertera sin Inóculo	Herbicida (dosis media)
Sin siembra	Acolchado
Sin siembra	Siega
Sin siembra	Cultivo intercalado con trébol
Sin siembra	Herbicida (dosis completa)
Sin siembra	Herbicida (dosis media)

Fecha de siembra: mayo 2025
Tratamientos filas: mayo 2025

CULTIVO DE COBERTERA: Trébol subterráneo (10 kg/ha), Trébol blanco (15 kg/ha), Trébol violeta (15 kg/ha), Ryegrass italiano (7.5 kg/ha), Ryegrass inglés (7.5 kg/ha)

Junio 2025: fertilización de los cultivos de cobertera con 60 kg/ha of P_2O_5 y 60 kg/ha of K_2O

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ECOLÓGICO

2 AÑO

Tres filas, cada fila con cinco árboles

CALLES	FILAS
Cultivo de Cobertera con Inóculo	Acolchado
Cultivo de Cobertera con Inóculo	Siega
Cultivo de Cobertera con Inóculo	Cultivo intercalado con trébol
Cultivo de Cobertera sin Inóculo	Acolchado
Cultivo de Cobertera sin Inóculo	Siega
Cultivo de Cobertera sin Inóculo	Cultivo intercalado con trébol
Sin siembra	Acolchado
Sin siembra	Siega
Sin siembra	Cultivo intercalado con trébol

Fecha de siembra: mayo 2025
Tratamientos filas: mayo 2025

CULTIVO DE COBERTERA: Trébol subterráneo (10 kg/ha), Trébol blanco (15 kg/ha), Trébol violeta (15 kg/ha), Ryegrass italiano (7.5 kg/ha), Ryegrass inglés (7.5 kg/ha)

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2

AÑO

CONVENCIONAL Y ECOLÓGICO

COSECHA: octubre 2025

PRODUCCIÓN Y BIODIVERSIDAD: junio y noviembre 2025
(calles y filas)

MUESTREOS DE SUELO: diciembre 2025

Producción de manzana

Zumo: pH, densidad, acidez total, grado Brix

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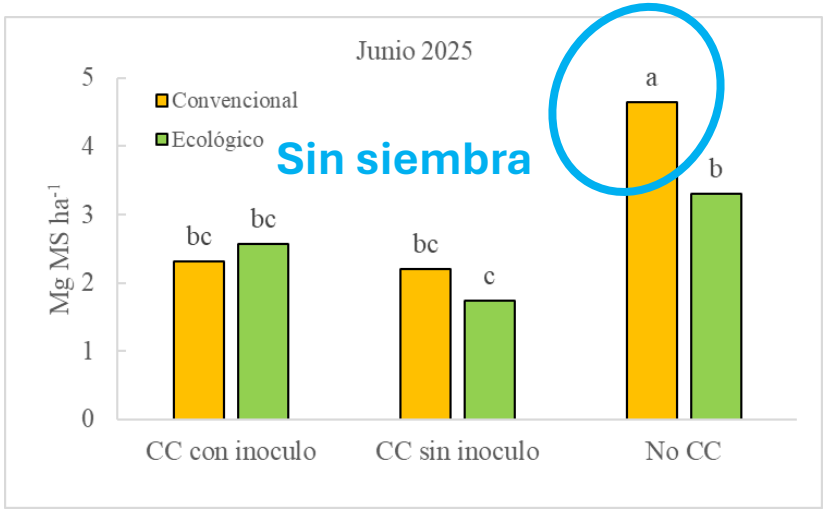
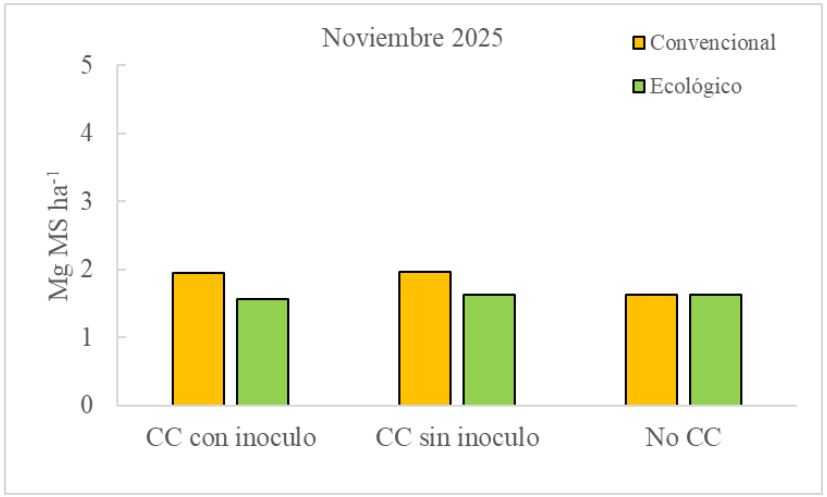
2

AÑO

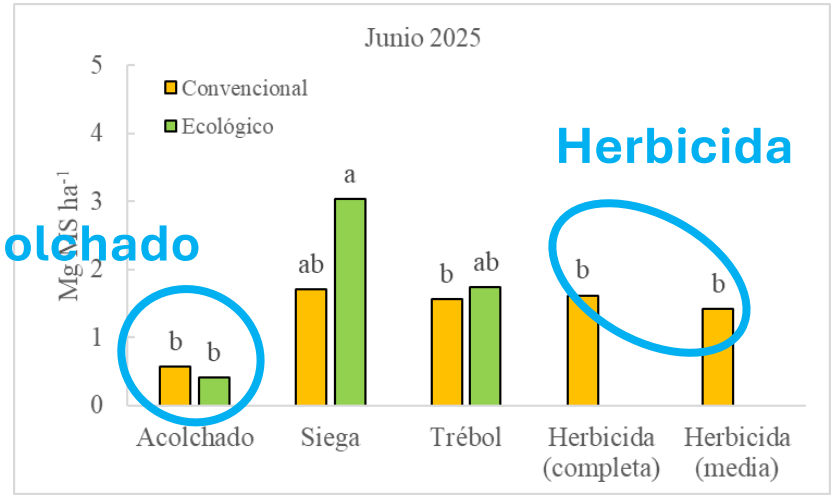
PRODUCCIÓN (CONVENCIONAL Y ECOLÓGICO)

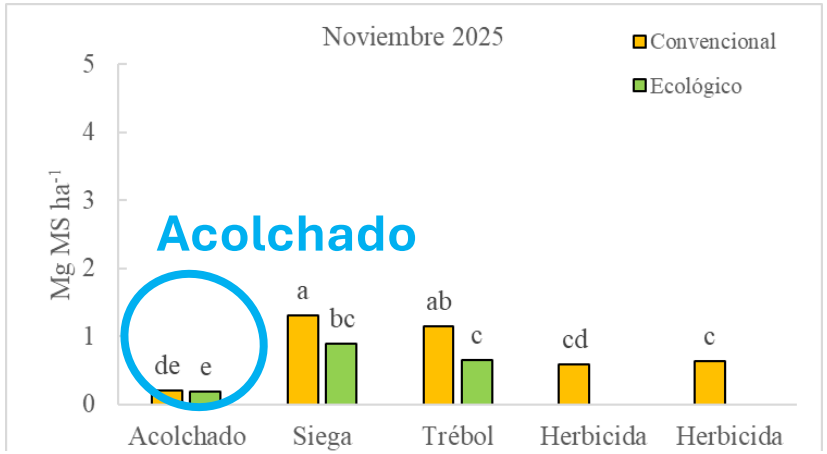
Calles





Líneas





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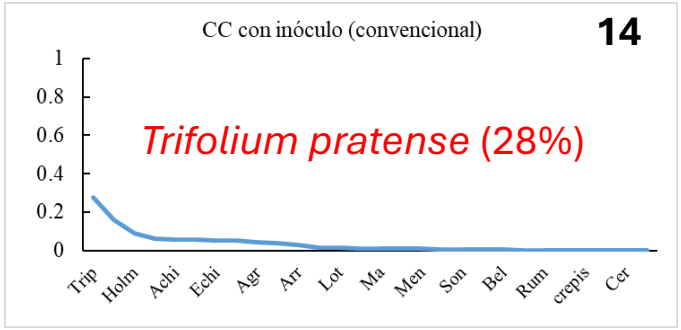
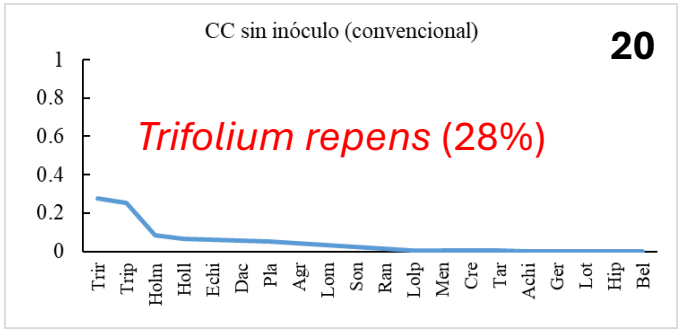
2 BIODIVERSIDAD (CONVENCIONAL)

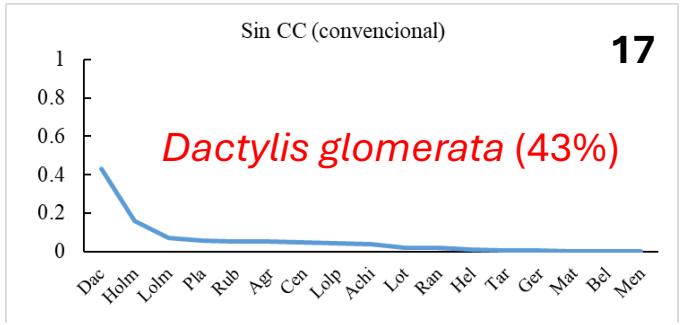
AÑO

CC + sp

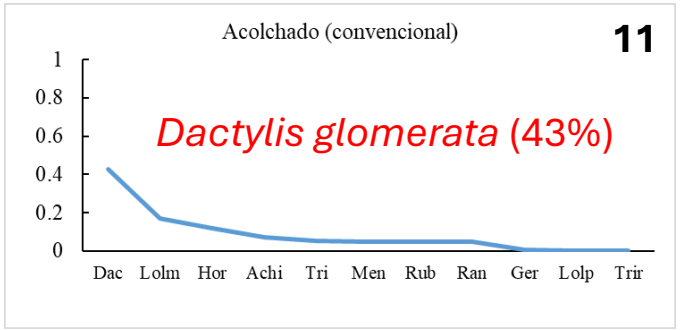
Calles

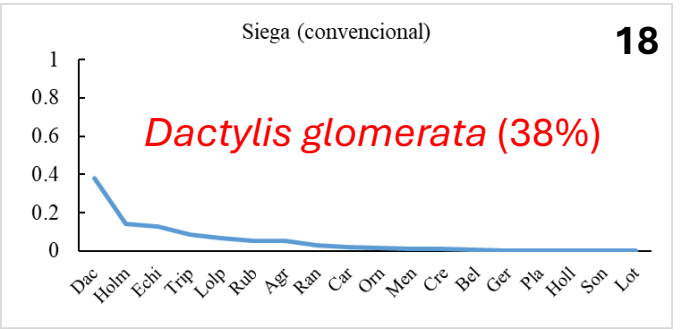


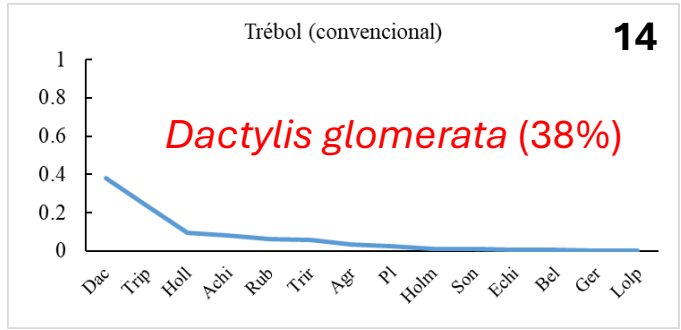


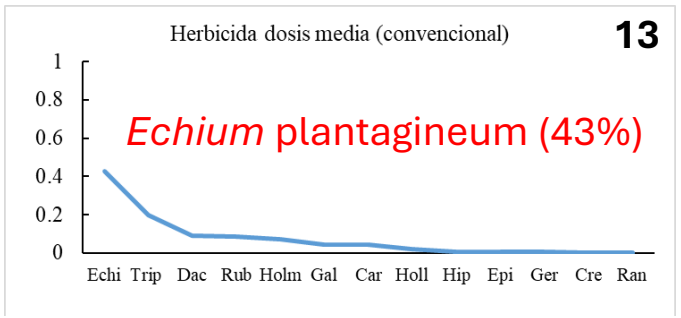


Líneas









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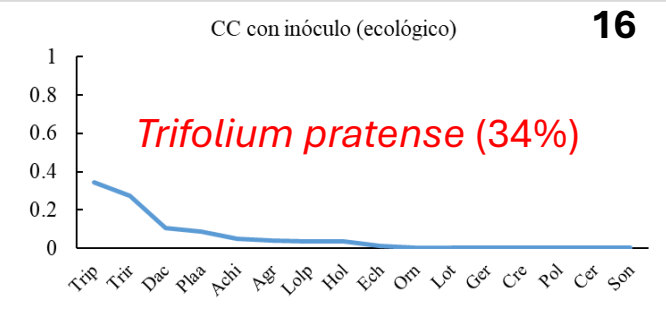
BIODIVERSIDAD (ECOLÓGICO)

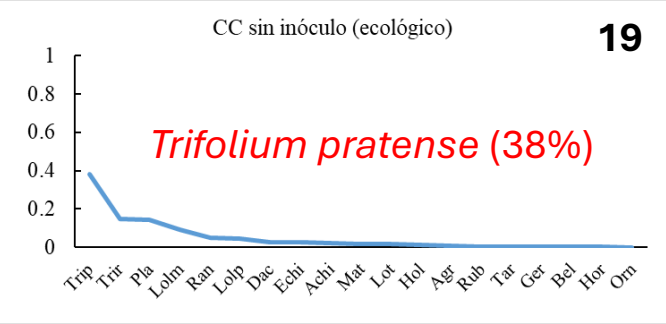
2

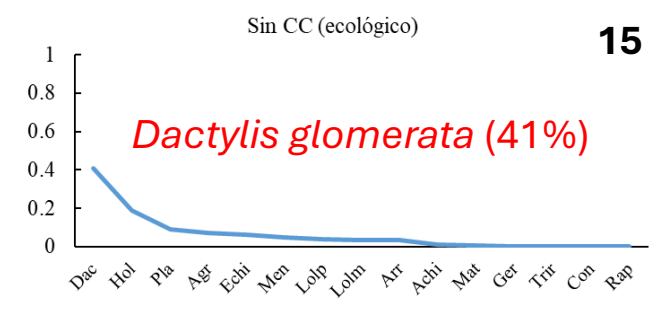
AÑO

CC + sp

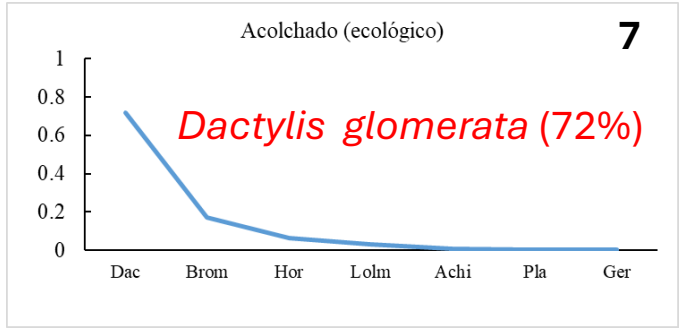
Calles

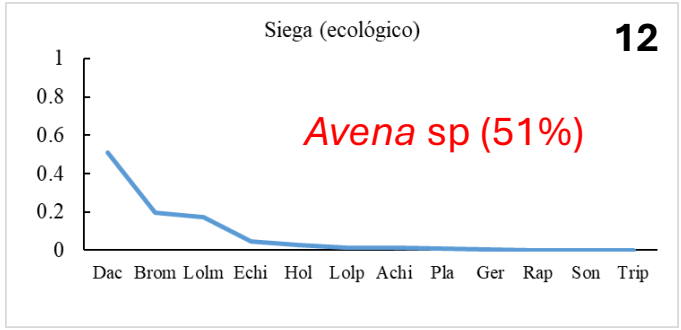


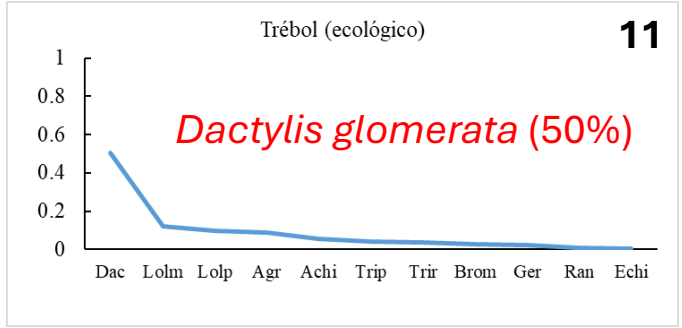




Líneas







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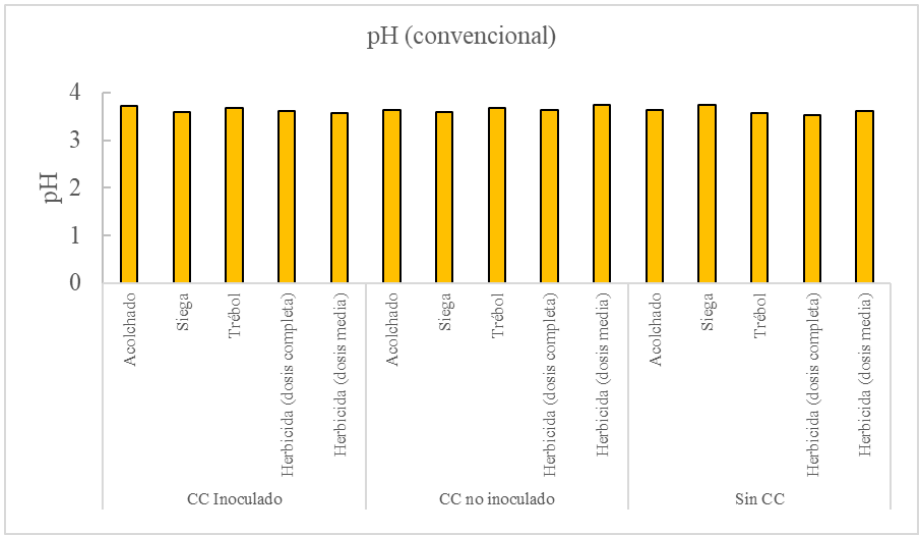
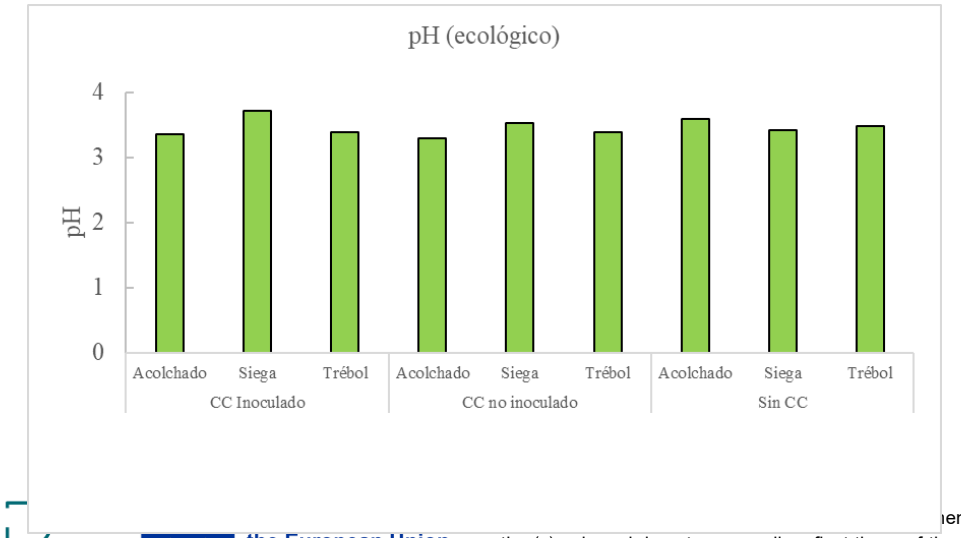
2

AÑO

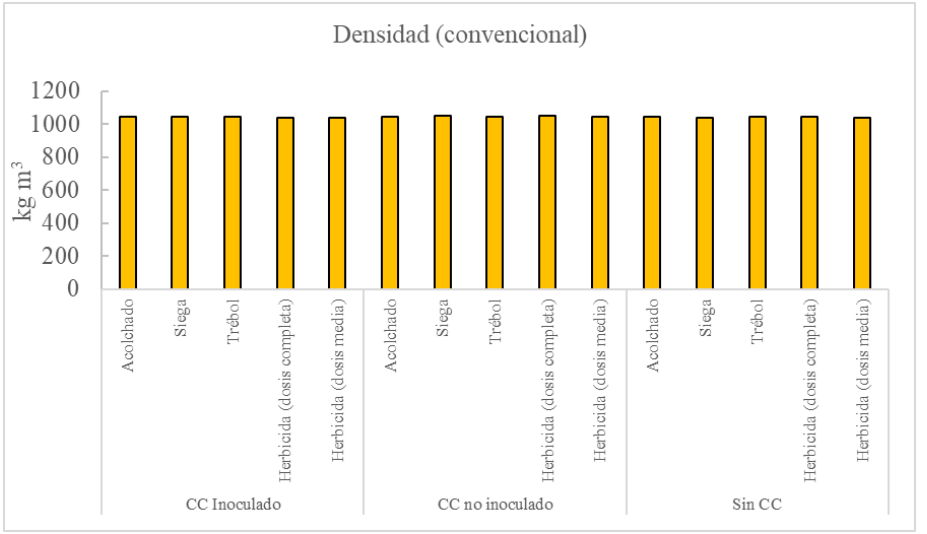
PROPIEDADES DEL ZUMO DE MANZANA (CONVENCIONAL Y ECOLÓGICO)

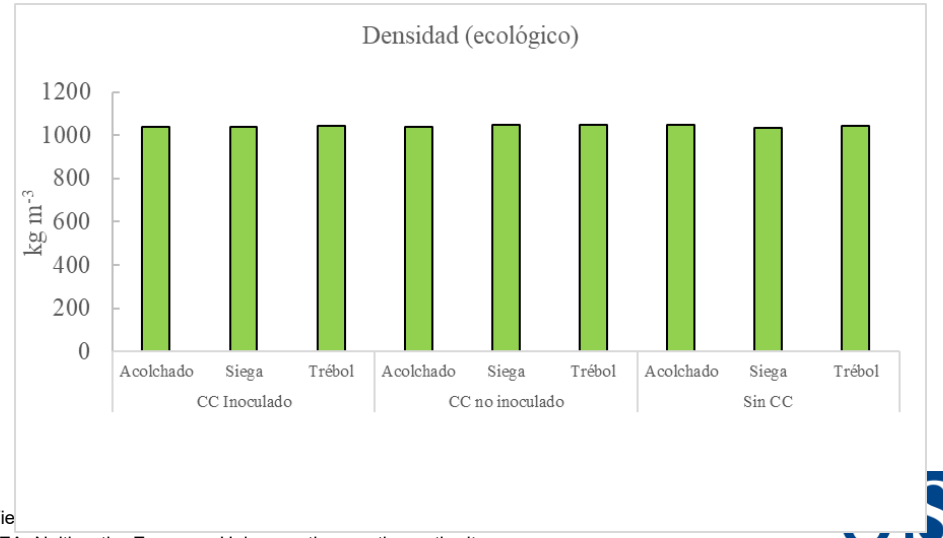
pH





Densidad





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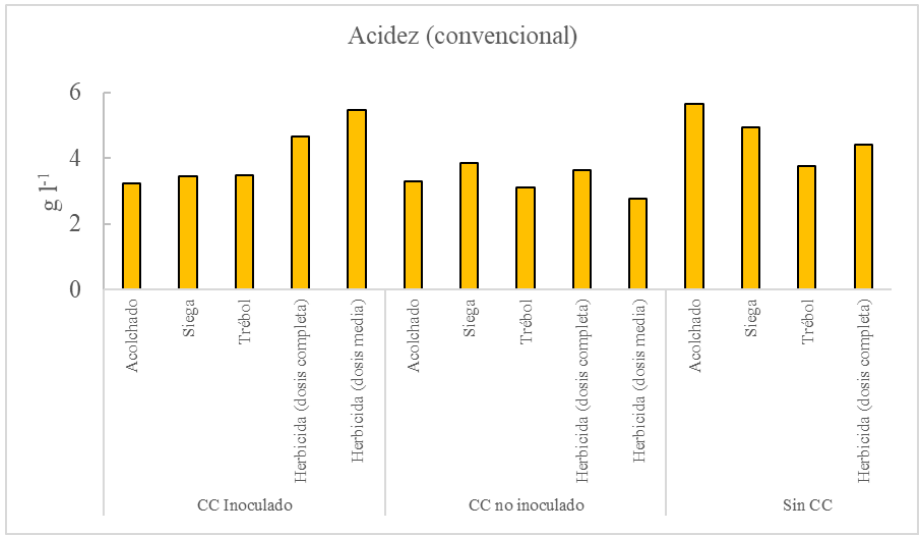
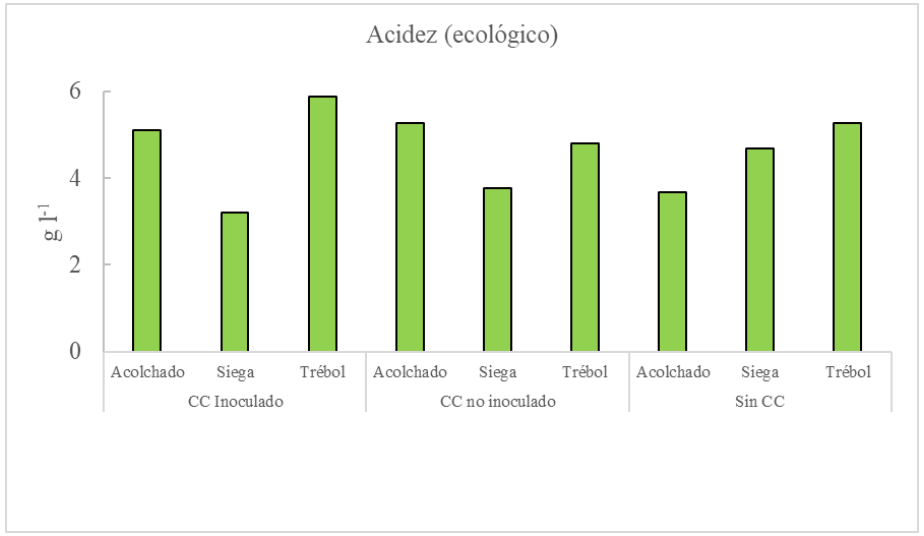
PROPIEDADES DEL ZUMO DE MANZANA (CONVENCIONAL Y ECOLÓGICO)

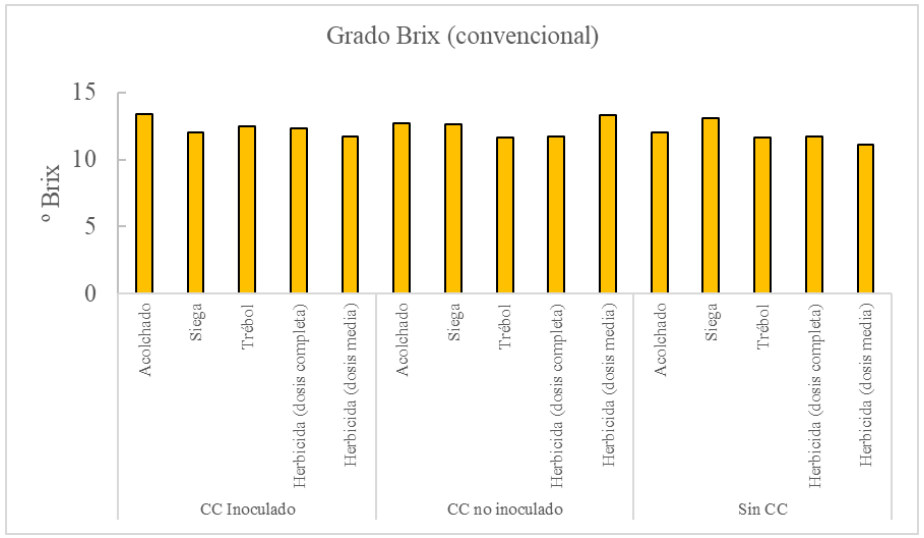
2 AÑO

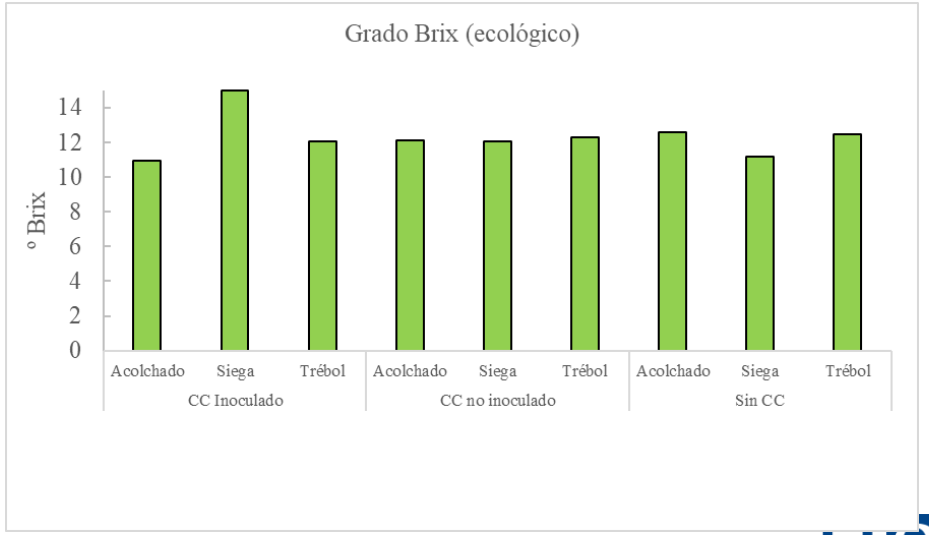
Acidez





Grado Brix





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2

AÑO

CONVENCIONAL Y ECOLÓGICO

RESIEMBRA DE LAS CALLES CON Y SIN INOCULO: octubre 2025

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3

AÑO

CONVENCIONAL Y ECOLÓGICO

APLICACIÓN DE LOS TRATAMIENTOS EN LAS LÍNEAS: marzo 2026

FERTILIZACIÓN CULTIVOS COBERTERA (CONVENCIONAL): marzo 2026

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CONCLUSIONES

- ✓ En general, los cultivos de cobertera reducen la producción e incrementan la biodiversidad en las calles, independientemente de si han sido inoculados o no.

- ✓ El uso de acolchado con paja presenta un efecto similar al de los herbicidas sobre la producción en las líneas del cultivo.

- ✓ En cuanto a la producción del cultivo principal, hasta el momento no se ha observado un efecto claro de los tratamientos. Por ello, es necesario continuar la evaluación durante el tercer año de estudio, con el fin de obtener resultados más concluyentes y determinar con mayor precisión su impacto.

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