



FITOVID

REPERCURSIÓN MEDIOAMBIENTAL DE LOS
FITOSANITARIOS APLICADOS. CAMPAÑA 2016.

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Determinación de fungicidas en diferentes matrices: condiciones experimentales

Acción **A3**

- **Mejora en los procedimientos** de Validación de métodos analíticos para la determinación de fungicidas en diferentes matrices
- Planificación técnica de las condiciones experimentales

Acción **B3**

- **Análisis y caracterización de residuos de productos fitosanitarios (UPV/EHU)**

Resumen de muestras procesadas

Primer Semestre

Muestras recepcionadas en Mayo 2016

- Aguas: A1, A2, A3, A4, A7, A9, A10 y A11
L6, L7, L8, L9, L10, L11, L12, L13, L14 y L15
- Suelos: A1, A2, A3, A4, A7, A8 A9, A10 y A11
L6, L7, L8, L9, L10, L11, L12, L13, L14 y L15
(por duplicado)

4 metodologías
analíticas distintas

TOTAL de analíticas:
288

Segundo Semestre

Muestras recepcionadas en Septiembre 2016- enero 2017

- Aguas: A1, A2, A3, A4, A7, A9, A10 y A11
L6, L7, L8, L9, L10, L11, L12, L13, L14 y L15
- Suelos: A1-A11 (11 muestras)
L1-L15 (15 muestras)
- Uvas: A1-A11 (11 muestras)
L1-L15 (15 muestras)
- Mostos: A1-A11 (11 muestras)
L1-L15 (15 muestras)
- Vinos: A1-A11 (11 muestras)
L1-L15 (15 muestras)
(por duplicado)

TOTAL de analíticas:
976

El **objetivo principal** de esta acción es proporcionar un *snapshot* de la situación de cada sub-parcela después de la aplicación de los fitosanitarios, para permitir al resto de socios del Proyecto establecer conclusiones fiables en base a datos reales de presencia de materias activas.

Determinación de fungicidas en diferentes matrices: condiciones experimentales

RECEPCIÓN de muestras

Servicio Central de
Análisis (Alava), SCAA

sgiker
Ikerkuntzarako
Zerbitzu Orokorrak
Servicios Generales
de Investigación



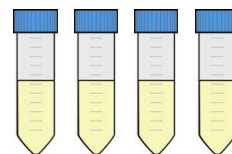
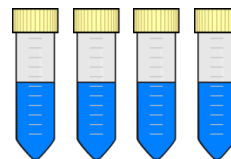
Aguas



Mostos



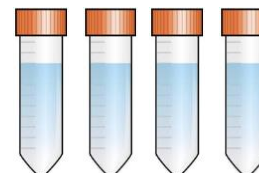
Vinos



Suelos



Uvas



-80 °C

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Determinación de fungicidas en diferentes matrices: condiciones experimentales

📄 **Análisis target de 15 fungicidas mediante LC-MS QQQ (Cimoxanilo, Boscalida, Dimetomorf, Quinoxifen, Metalaxil, Folpet, Benalaxil, Ciazofamida, Iprovalicarb, Metrafenona, Penconazol, Meptildinocap, Tebuconazol, Triadimenol y Piraclostrobin)**

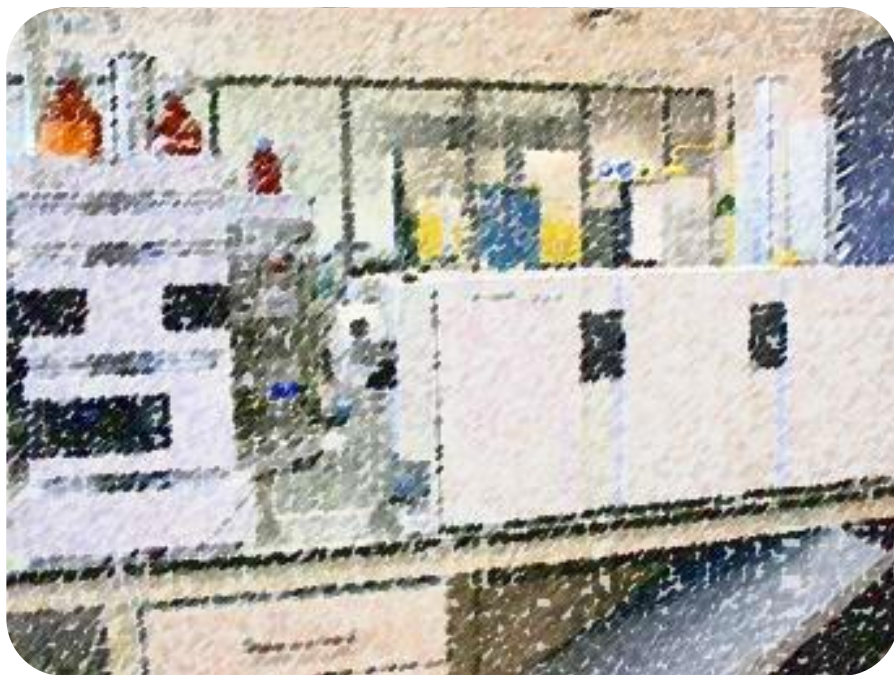
📄 **Análisis de Fosetyl-Al mediante LC-MS single Q**

📄 **Análisis de Mancozeb y Metiram (DTC) mediante GC-MS**

📄 **Análisis compuestos inorgánicos (Oxicloruro de Cu y S) mediante ICPMS**



1. Análisis target de 15 fungicidas mediante LC-MS QqQ



1. Análisis target de 15 fungicidas mediante LC-MS QqQ

LC-ESI-MSMS



- Cimoxanilo
- Boscalida
- Dimetomorph
- Quinoxifen
- Metalaxil
- Folpet
- Benalaxyl
- Cianofamida
- Iprovalicarb
- Metrafenona
- Penconazol
- Meptildinocap
- Tebuconazol
- Triadimenol
- Piraclostribin

Chromatographic conditions

Columna: ZORBAX SB-C18 NB (2.1 x 100 mm, 3.5 μ m)



Fase móvil: 96% A (5mM formiato amónico+0.01 % fórmico)
4% B (ACN/agua 5mM form. amon.+0.01% form)

Modo gradiente

QqQ MS conditions

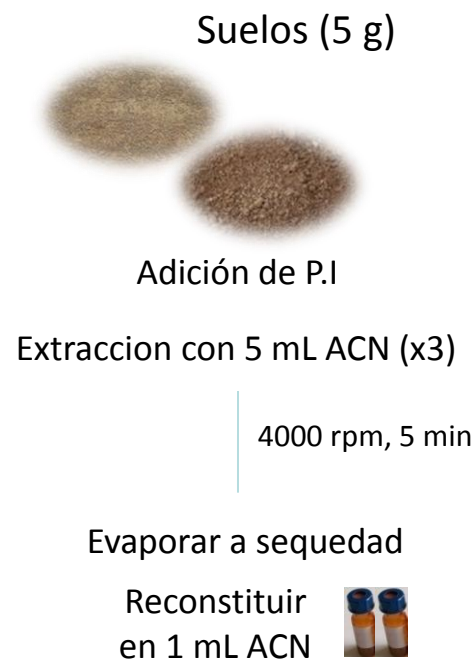
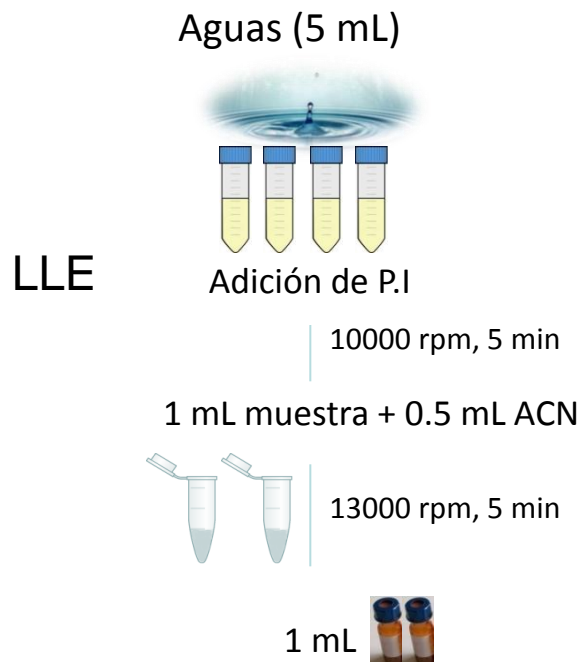
Fuente ionización: **ESI**

Modo ionización: positivo

Modo adquisición: dMRM

1. Análisis target de 15 fungicidas mediante LC-MS QqQ

Procedimiento de extracción



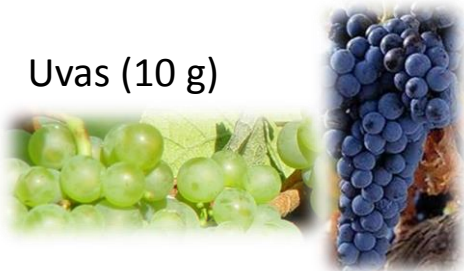
Volumen inyección 5 μ L



1. Análisis target de 15 fungicidas mediante LC-MS QqQ

Procedimiento de extracción

Uvas (10 g)



Mostos (10 g)



Vino (10 g)



Adición de P.I (Tebuconazole D₉)

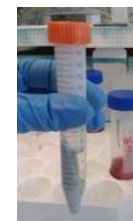
Método QuEChERS (Extracción en Fase Sólida Dispersiva)



ACN
MgSO₄, NaCl
Agitar
8000 rpm, 5 min



PSA
Agitar
8000 rpm, 5 min



1mL sobrenadante

Evaporar

Reconstituir
en 0.5mL ACN



1. Análisis target de 15 fungicidas mediante LC-MS QqQ

EVALUACIÓN ANALÍTICA del MÉTODO



EUROPEAN COMMISSION

Safety of the Food Chain Pesticides and biocides

SANTE/11945/2015

Sustituye

SANCO/12571/2013

(01/01/2016)

*Guidance document on analytical quality control and **method validation procedures** for **pesticides residues** analysis in food and feed*

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1. Análisis target de 15 fungicidas mediante LC-MS QqQ

MRL

El nivel más alto de un residuo de plaguicida que se tolera legalmente en alimentos o piensos cuando los pesticidas se aplican correctamente (Buenas Prácticas Agrícolas)

Pesticide residues and maximum residue levels (mg/kg)



| PESTICIDE | Pesticide residue (mg/kg) | Code number | Legislation |
|-----------------------------------------------------------------------------------------------------------------------|---------------------------|-----------------------|-------------------------------------------------------------------|
| Ditiocarbamatos, expresados en CS2 , incluidos maneb, mancoceb , metiram, propineb, tiram y ziram | 5 | 0151020 | Reg. (EU) No 34/2013 |
| Compuestos del cobre (cobre) | 50 | 0151020 | Reg. (EC) No 149/2008 |
| Azufre | No MRL required | 0151020 | Reg. (EC) No 459/2010 |
| Fosetil-Al (suma de fosetil, ácido fosfónico y sus sales, expresada como fosetil) | 100 | 0151020 | Reg. (EU) No 991/2014 |
| Folpet (R) | 10 | | Reg. (EU) No 251/2013 |
| Pesticides Residues in Food and Feed | | CODEX Alimentarius | year of adoption/Legislation |
| Cymoxanil | 0.2 | | |
| Metalaxyl | 1 | FB 0269 | |
| Dimetomorph | 2 | FB 0269 | 2008 |
| Triadimenol | 2 | | |
| Iprovalicarb | 2 | | |
| Boscalida | 5 | FB 0269 | 2010 |
| Tebuconazol | 6 | FB 0269 | 2012 |
| Penconazol | 0.2 | FB 0269 | 1997 |
| Ciazofamida | 2 | | Reg. (UE) 2016/1, modifica anexos del Reglamento (CE) No 396/2005 |
| Benalaxyl | 0.3 | FB 0269 | 2010 |
| Piraclostrubin | 2 | FB 0269 | 2006 |
| Metrafenona | 7 | | Reg. (UE) 2016/1, modifica anexos del Reglamento (CE) No 396/2005 |
| Qunioxifen | 2 | FB 0269 | 2007 |
| Meptyldinocap | 0.2 | FB 0269 | 2011 |

1. Análisis target de 15 fungicidas mediante LC-MS QqQ

PARÁMETROS DE VALIDACIÓN

- Límite cuantificación (LOQ), RSD < 20%
- Rango lineal



| AGUAS | Rango lineal (µg/mL) | Coefficiente correlacion (r) | LOQ (µg/mL) |
|-------|----------------------|------------------------------|-------------|
| | 0.018-2.27 | > 0.99 | 0.018 |



| SUELOS | Rango lineal (µg/g) | Coefficiente correlacion (r) | LOQ (µg/g) |
|---------------|---------------------|------------------------------|------------|
| | 0.02-6.0 | > 0.99 | 0.02 |
| Folpet | 0.25-6.0 | | 0.25 |
| Meptildinocap | 0.05-6.0 | | 0.05 |



| UVAS | Rango lineal (µg/g) | Coefficiente correlacion (r) | LOQ (µg/g) |
|---------------|---------------------|------------------------------|------------|
| | 0.01-1.5 | > 0.99 | 0.01 |
| Folpet | 0.125-2.0 | | 0.125 |
| Meptildinocap | 0.75-2.0 | | 0.75 |



| MOSTOS | Rango lineal (µg/mL) | Coefficiente correlacion (r) | LOQ (µg/mL) |
|---------------|----------------------|------------------------------|-------------|
| | 0.01-1.5 | > 0.99 | 0.01 |
| Folpet | 0.125-2.0 | | 0.125 |
| Meptildinocap | 0.125-2.0 | | 0.125 |

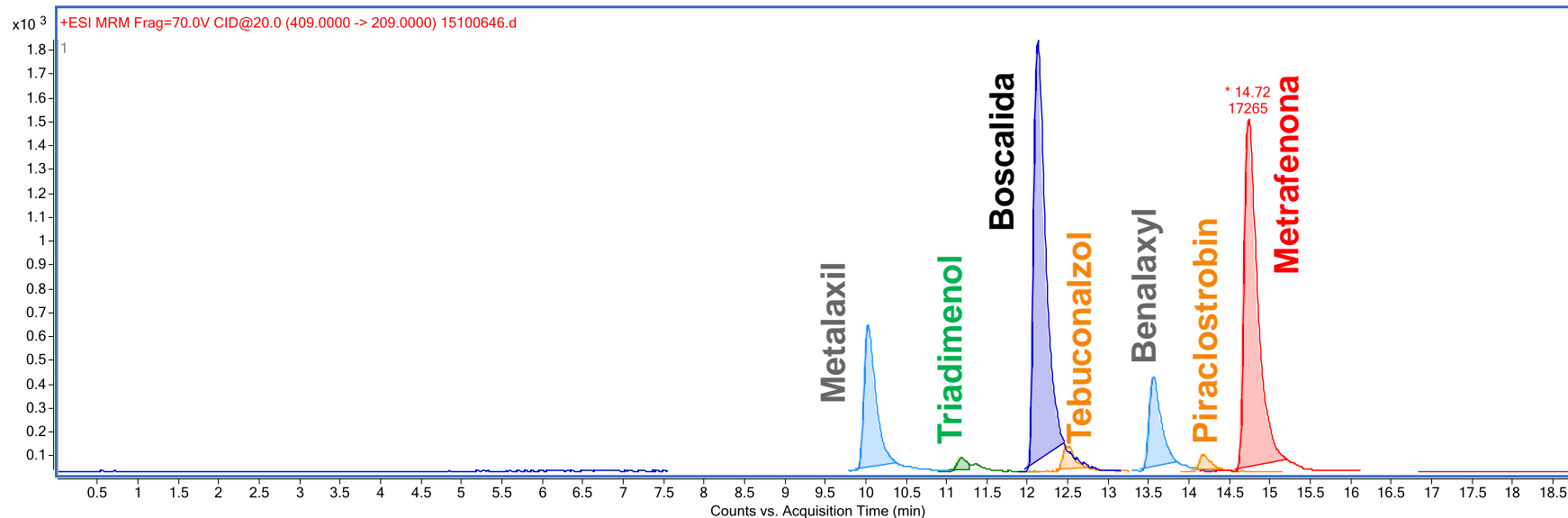


| VINOS | Rango lineal (µg/mL) | Coefficiente correlacion (r) | LOQ (µg/mL) |
|---------------|----------------------|------------------------------|-------------|
| | 0.01-1.5 | > 0.99 | 0.01 |
| Folpet | 0.125-2.0 | | 0.125 |
| Meptildinocap | 0.125-2.0 | | 0.125 |

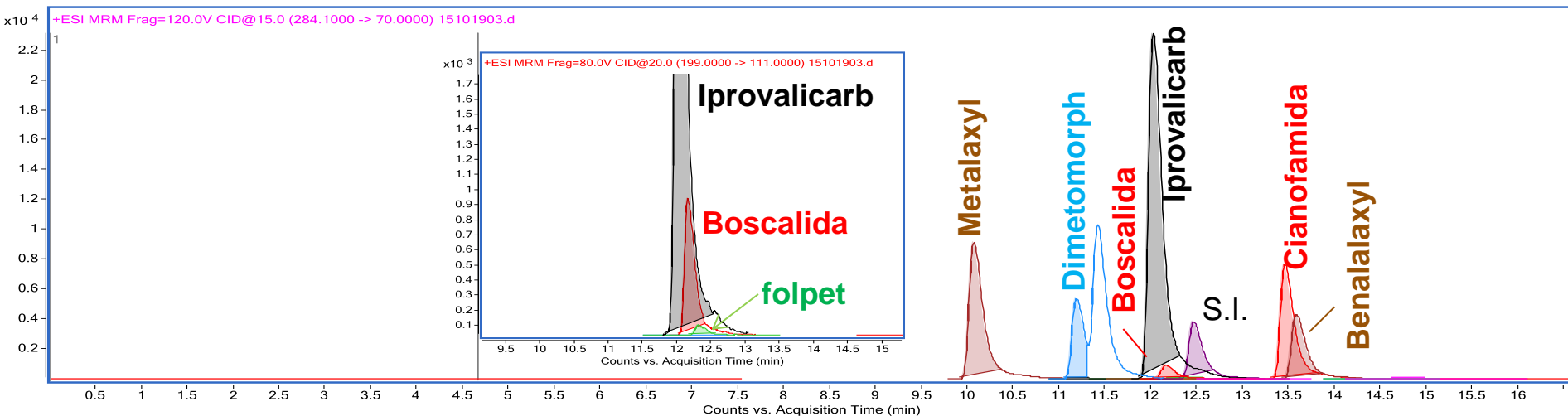


1. Análisis target de 15 fungicidas mediante LC-MS QqQ

Cromatograma de una muestra de SUELO



Cromatograma de una muestra de MOSTO (A1)



2.

Análisis de Fosetyl-Al mediante LC-MS single Q



Chromatographic conditions

Columna: ZORBAX Extend-C18 (3 x 150 mm, 5 μ m)
Temperatura : 30
Fase móvil: 95% A (agua)
5% B (ACN) Modo gradiente
Flujo: 0.3 mL/min
Volumen inyec: 2 μ L



Single Quad MS conditions

Fuente ionización: **ESI**
Modo ionización: negativo
Modo adquisición SIM
Iones: 109, 81, 63

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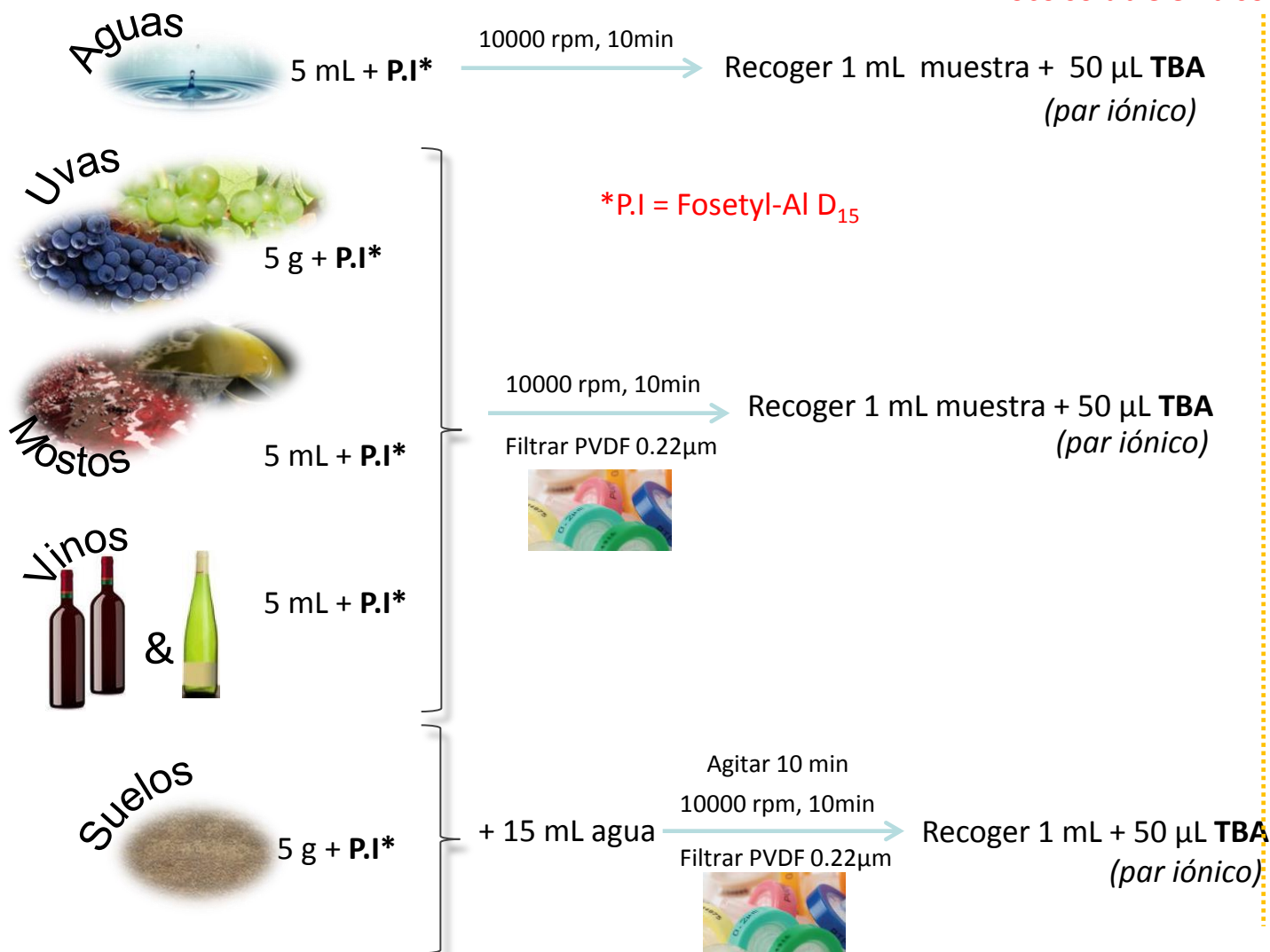


2.

Análisis de Fosetyl-Al mediante LC-MS single Q

Procedimiento de extracción

✗ Poco soluble en disolventes orgánicos



LC-SQ



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2.

Análisis de Fosetyl-Al mediante LC-MS single Q


PARÁMETROS DE VALIDACIÓN

- Límite cuantificación (LOQ), RSD < 20%
- Rango lineal
- Precisión del método (repetibilidad)




| AGUAS | Rango lineal (µg/mL) | Coefficiente correlacion (r) | LOQ (µg/mL) | Precisión (RSD) |
|----------|----------------------|------------------------------|-------------|-----------------|
| Pool A+L | 0.005-2 | 0.9999 | 0.005 | 5.8 |

Precisión en el día a 0.005 µg/mL




| SUELOS | Rango lineal (µg/g) | Coefficiente correlacion (r) | LOQ (µg/g) | Precisión (RSD) |
|----------|---------------------|------------------------------|------------|-----------------|
| Pool A+L | 0.1-5.0 | 0.995 | 0.1 | 17.4 |

Precisión en el día a 0.1 µg/g




| UVAS | Rango lineal (µg/g) | Coefficiente correlacion (r) | LOQ (µg/g) | Precisión (RSD) |
|----------|---------------------|------------------------------|------------|-----------------|
| Pool A+L | 0.3-4.0 | 0.997 | 0.1 | 13.5 |

Precisión en el día a 0.5 µg/g



| MOSTOS | Rango lineal (µg/mL) | Coefficiente correlacion (r) | LOQ (µg/mL) | Precisión (RSD) |
|-----------|----------------------|------------------------------|-------------|-----------------|
| Laguardia | 0.1-5.0 | 0.996 | 0.02 | 7.7* |
| Aia | 0.1-5.0 | 0.996 | 0.02 | 10.7** |

Precisión en el día a* 0.3 µg/mL y a **0.1 µg/mL



| VINOS | Rango lineal (µg/mL) | Coefficiente correlacion (r) | LOQ (µg/mL) | Precisión (RSD) |
|-----------|----------------------|------------------------------|-------------|-----------------|
| Laguardia | 0.1-4.0 | 0.9997 | 0.1 | 1.8 |
| Aia | 0.1-4.0 | 0.9997 | 0.1 | 3.2 |

Precisión en el día a 0.1 µg/mL

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3. Análisis de Mancozeb y Metiram mediante GC-MS



Chromatographic conditions



Columna: CP Sil 5CB (30 m x 0.32 mm, 3 μ m)
Horno: 45 ° C $\xrightarrow{40^\circ \text{ C/min}}$ 250 ° C
(2min)
Flujo He: 2 mL/min
Inyector: 220 ° C, modo split

MS conditions

| | |
|------------------|------------|
| Modo adquisición | SIM |
| Iones: | 76, 78, 38 |
| MS source: | 230 ° C |
| MS Quad: | 150 ° C |

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3. Análisis de Mancozeb y Metiram mediante GC-MS

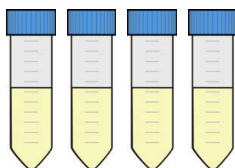
Procedimiento de extracción

- Ditiocarbamatos: Mancozeb y metiram

Suelos (4g)



Aguas (4mL)



Uvas (2 g)



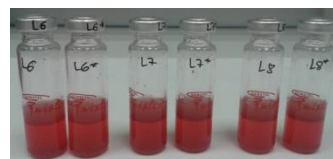
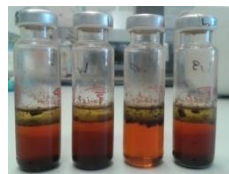
Mostos (2 mL)



Vinos (2 mL)

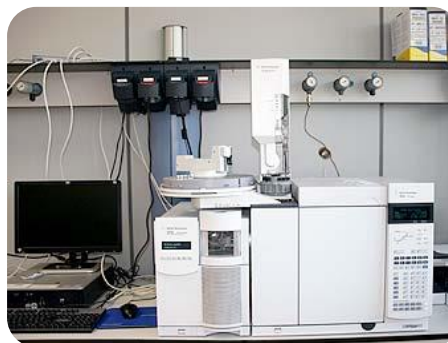


1º Reducción de DTC en **condiciones ácidas** fuertes en presencia de SnCl_2 (agente reductor)



2º Extracción con **isooctano**

3º Inyectar 2 μL en el sistema **GC-MS**




Resultados expresados como **CS_2 total**

3. Análisis de Mancozeb y Metiram mediante GC-MS

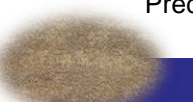
PARÁMETROS DE VALIDACIÓN

- Límite cuantificación (LOQ), RSD < 20%
- Rango lineal
- Precisión del método (repetibilidad)




| AGUAS | Rango lineal (µg/mL) | Coefficiente correlacion (r) | LOQ (µg/mL) | Precisión (RSD) |
|----------|----------------------|------------------------------|-------------|-----------------|
| Pool A+L | 0.05-2 | 0.999 | 0.1 | 23.6 |

Precisión en el día a 0.1 µg/mL




| SUELOS | Rango lineal (µg/g) | Coefficiente correlacion (r) | LOQ (µg/g) | Precisión (RSD) |
|-----------|---------------------|------------------------------|------------|-----------------|
| Laguardia | 0.2-3 | 0.997 | 0.2 | 18.4 |
| Aia | 0.1-3 | 0.999 | 0.2 | 8.8 |

Precisión en el día al LDC µg/g




| UVAS | Rango lineal (µg/g) | Coefficiente correlacion (r) | LOQ (µg/g) | Precisión (RSD) |
|-----------|---------------------|------------------------------|------------|-----------------|
| Laguardia | 0.05-1 | 1 | 0.05 | 11.6 |
| Aia | 0.05-1 | 0.9995 | 0.05 | 3.9 |

Precisión en el día a 0.05 µg/g



| MOSTOS | Rango lineal (µg/mL) | Coefficiente correlacion (r) | LOQ (µg/mL) | Precisión (RSD) |
|-----------|----------------------|------------------------------|-------------|-----------------|
| Laguardia | 0.05-1.5 | 0.998 | 0.05 | 5.0 |
| Aia | 0.05-1.5 | 0.9997 | 0.05 | 10.1 |

Precisión en el día a 0.05 µg/g



| VINOS | Rango lineal (µg/mL) | Coefficiente correlacion (r) | LOQ (µg/mL) | Precisión (RSD) |
|-----------|----------------------|------------------------------|-------------|-----------------|
| Laguardia | 0.01-0.5 | 0.9998 | 0.05 | 4.2 |
| Aia | 0.01-0.5 | 0.9997 | 0.05 | 2.4 |

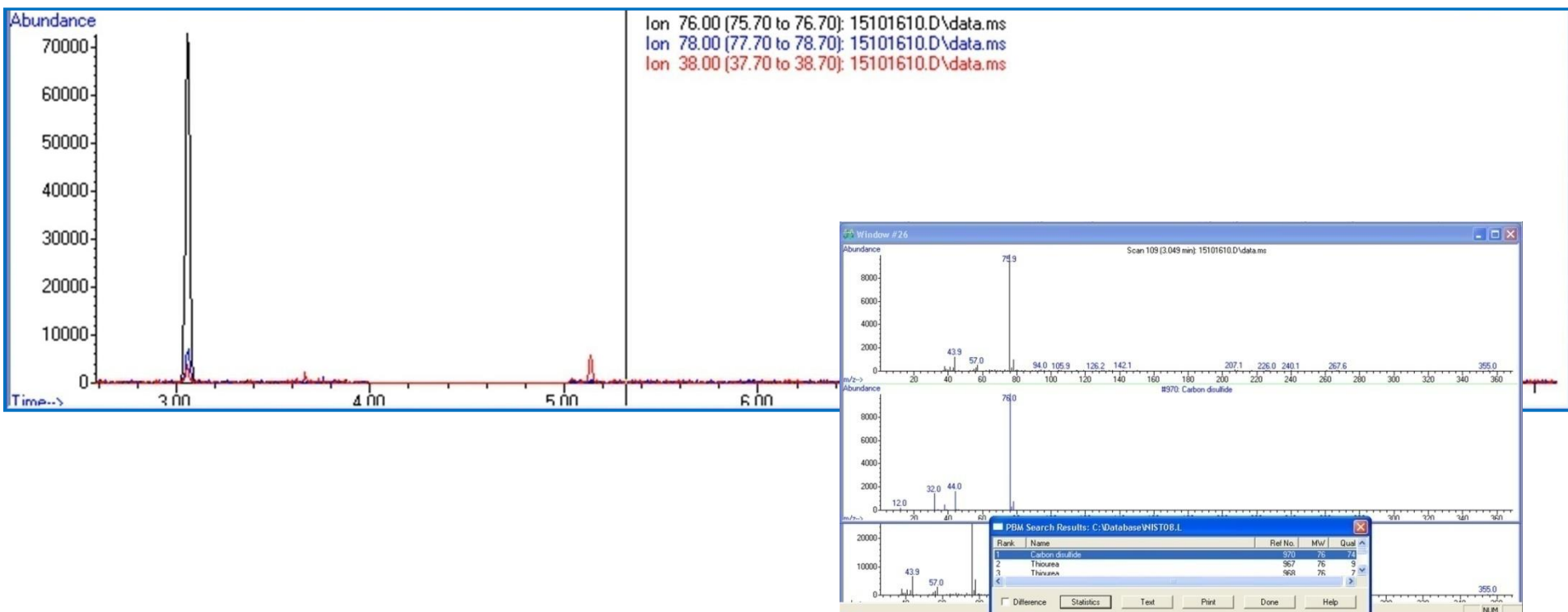
Precisión en el día a 0.01 µg/mL

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3. Análisis de Mancozeb y Metiram mediante GC-MS

Extracted Ion Chromatogram (EIC) de una muestra de AGUA dopada a 5ppm con *Tiram* y posteriormente reducido a CS₂



4. Análisis de compuestos inorgánicos mediante ICPMS



ICPMS conditions

Potencia de radio frecuencia: 1500 W
Flujo gas plasmógeno: 15 L min^{-1}
Flujo gas nebulizador: 0.90 L min^{-1}
Flujo gas auxiliar: 0.15 L min^{-1}
Tipo nebulizador: MicroMist
Cámara nebulización: doble paso Scott

Antorcha : tipo Fassel

Conos: Ni

Tiempo integración por masa: 300 ms

Isótopos monitorizados: ^{33}S , ^{34}S , ^{63}Cu , ^{65}Cu , ^{89}Y ,
 ^{147}Sm , ^{193}Y

Modo adquisición: spectrum



4. Análisis de compuestos inorgánicos mediante ICPMS

Procedimiento de extracción

- Oxiclорuro de Cobre y Azufre

Aguas (3 mL)



Centrifugación



10000 rpm, 5min

Suelos (0.25 g)



MWAE en 2 ciclos
1º) $\text{HNO}_3 + \text{HF}$
2º) Ac. bórico

Uvas



Mostos



Vinos

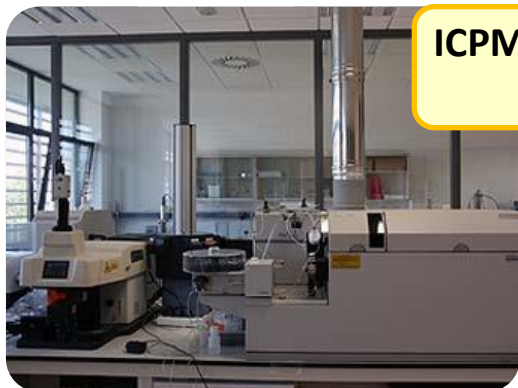


MWAE con:
 $\text{HNO}_3 + \text{H}_2\text{O}_2$



ICPMS con celda: $\text{He} \rightarrow \text{Cu}$
 $\text{H}_2 \rightarrow \text{S}$

Adición Sm (EFECTO MATRIZ)
Adición P.I. (Y e Ir) en continuo



4. Análisis de compuestos inorgánicos mediante ICPMS

PARÁMETROS DE VALIDACIÓN

- Límite cuantificación (LOQ), RSD < 20%
- Rango lineal



| AGUAS | Rango lineal* | Coefficiente correlacion (r) | LOQ |
|-------|---------------|------------------------------|----------|
| Cu | 0.2-50.0 | > 0.999 | 0,2 µg/L |
| S | 0.2-50.0 | > 0.999 | 1 mg/L |

*Cu (µg/L) y S (mg/L)



| SUELOS | Rango lineal (mg/kg) | Coefficiente correlacion (r) | LOQ |
|--------|----------------------|------------------------------|------------|
| Cu | 0.2-50.0 | > 0.999 | 0.16 mg/kg |
| S | 0.2-50.0 | > 0.999 | 400 mg/kg |



| UVAS | Rango lineal (mg/kg) | Coefficiente correlacion (r) | LOQ |
|------|----------------------|------------------------------|-----------|
| Cu | 0.2-50.0 | > 0.999 | 0.2 mg/kg |
| S | 0.2-50.0 | > 0.999 | 200 mg/kg |



| Mostos | Rango lineal* | Coefficiente correlacion (r) | LOQ |
|--------|---------------|------------------------------|------------|
| Cu | 0.2-50.0 | > 0.999 | 0.12 mg/kg |
| S | 0.2-50.0 | > 0.999 | 200 mg/kg |



| VINOS | Rango lineal* | Coefficiente correlacion (r) | LOQ |
|-------|---------------|------------------------------|-----------|
| Cu | 0.2-50.0 | > 0.999 | 62,5 µg/L |
| S | 0.2-50.0 | > 0.999 | 62,5 mg/L |

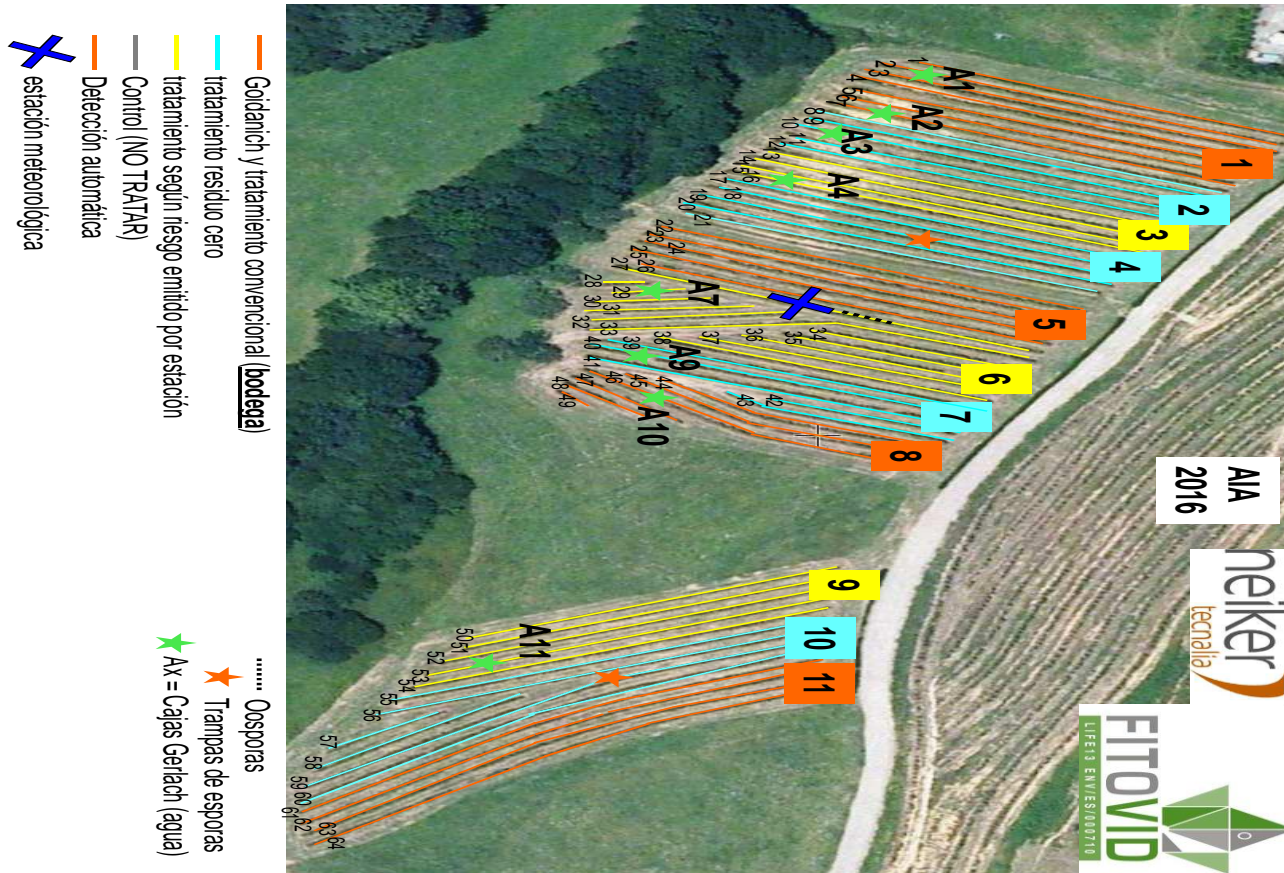
*Cu (µg/L) y S (mg/L)

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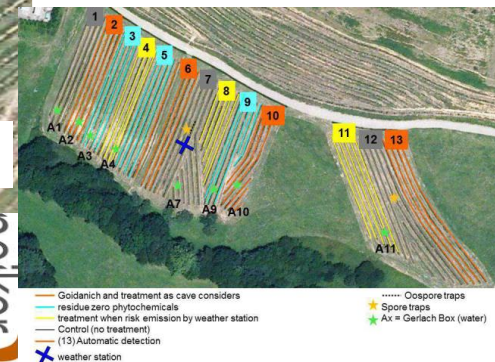


RESULTADOS y CONCLUSIONES GENERALES (PARCELAS)

PARCELA AIA



AIA 2015



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parcela de AIA

| | | | | | |
|---------|------------|-----------------|-----------------------------------------------|-----------|------------|
| 4/4/16 | TODAS | MILRAZ MZ | 4% cimoxanilo + 40% Manxozeb | 0,30% | 440 litros |
| 26/4/16 | Naranjas | MIKAL PLUS | Folpet 25% + Fosetil AI 50% + cimoxalino4% | 0,30% | 180 litro |
| | | MICRORAM | Oxicloruro de cu 50% | 0,35% | |
| 10/5/16 | Naranjas | MIKAL PLUS | Folpet 25% + Fosetil AI 50% + cimoxalino4% | 0,30% | 185 litros |
| | | POLTIGLIA | Sulfato cuprocálcico | 0,60% | |
| 18/5/16 | Amarillas | RIDOMIL | mefenoxam | 200gr/hl | 140 Litros |
| 20/5/16 | Azules | MIMOSAN | | 150cl/hl | 170 litros |
| 24/5/16 | Naranjas | PLANET PLUS | Metalaxil 8% + Manxozeb 64% | 0,30% | 235 litros |
| 24/5/16 | Azules | CUPRIN | cobre 6% | 0,30% | 220 litros |
| 2/6/16 | Amarillas | TAIREL C | Benalaxil + oxicloruro de cobre | 0,50% | 260 litros |
| 2/6/16 | Azules | MANICA | Cobre | 1% | 320 litros |
| 8/6/16 | Naranjas | BAROLON COMBI | Meferoxam 5% + Folpet 40% | 0,20% | 340 litros |
| 21/6/16 | Amarillas | MIKAL PREMIUN | folpet 25% + fosetil-al 50% + iprovalicarb 4% | 0,33% | 270 litros |
| | | CODIMUR | Folpet 30%+oxicloruro de cobre 16% | 0,25% | |
| 21/6/16 | Azules | MANICA | Sulfato Cuprocálcico 12,4% | 1% | 270 litros |
| | | MIMOSAN | | 150cl/hl | |
| 21/6/16 | Naranjas | MELODY | Iprovalicarb + folpet | 0,25% | 270 litros |
| 1/7/16 | Naranjas | Mikal Premiun F | folpet 25% + fosetil-al 50% + iprovalicarb 4% | 0,35% | 220 litros |
| | | Ossirame 50% | Oxicloruro de cu 50% | 0,40% | |
| 5/7/16 | Naranjas | Mikal Premiun F | folpet 25% + fosetil-al 50% + iprovalicarb 4% | 0,35% | 285 litros |
| | | Ossirame 50% | Oxicloruro de cu 50% | 0,40% | |
| 5/7/16 | Amarillas | PEARZE | Folpet 25% + Fosetil AI 50% + cimoxalino4% | 0,30% | 230 litros |
| 7/7/16 | Azules | MANICA | Sulfato Cuprocálcico 12,4% | 2% | 250 litros |
| 14/7/16 | Naranjas | FORUM | dimetomorf | 0,20% | 230 litros |
| | | MANSAR | mancoceb | 0,30% | |
| 21/6/16 | Azules | CUPRIN | cobre | 0,30% | 270 litros |
| | | MIMOSAN | | 150 cl/hl | |
| 28/7/16 | Naranjas | MILRAZ MZ | 4% cimoxanilo + 40% Manxozeb | 0,30% | 270 litros |
| 28/7/16 | Montteburu | SHAVIT | Triadimenol 25% | 0,05% | 260 litros |
| 29/7/16 | Amarillas | MILDICUT | Ciazofamida | 4,5 L/ha | 230 litros |
| 29/7/16 | Azules | CUPRIN | cobre | 0,30% | 280 litros |
| | | MIMOSAN | | 150 cl/hl | |
| 1/9/16 | Azules | CUPRIN | cobre | 0,30% | 270 litros |
| | | MIMOSAN | | 150 cl/hl | |
| 1/9/16 | Amarillas | FORUM | dimetomorf | 0,20% | 235 litros |
| 1/9/16 | Naranjas | MILDICUT | Ciazofamida | 4,5 L/ha | 320 litros |
| | | SONG | TEBUCONAZOL 25% | 0,10% | |
| | | REBUT | Iprodiona 50% | 1,5 kg/ha | |

| AGUAS | A1 | A2 | A3 | A4 | A7 | A9 | A10 | A11 | UNIDADES |
|-----------------------|-------|-------|-------|-------|-------|-------|-------|-------|----------|
| CIMOXANILO | nd | nd | nd | nd | nd | nd | nd | nd | mg/L |
| METALAXYL | 0,02 | nd | nd | nd | nd | nd | nd | nd | mg/L |
| DIMETOMORPH1 | 0,04 | <loq | <loq | 0,03 | <loq | nd | <loq | 0,03 | mg/L |
| TRIADIMENOL 1 | 0,08 | 0,04 | nd | nd | nd | nd | 0,03 | 0,03 | mg/L |
| IPROVALICARB | <loq | <loq | nd | nd | nd | nd | <loq | <loq | mg/L |
| BOSCALIDA | 0,03 | nd | nd | nd | nd | nd | nd | nd | mg/L |
| FOLPET | nd | nd | nd | nd | nd | nd | nd | nd | mg/L |
| TEBUCONAZOL | nd | nd | nd | nd | nd | nd | nd | nd | mg/L |
| PENCONAZOL | nd | nd | nd | nd | nd | nd | nd | nd | mg/L |
| CIAZOFAMIDA | nd | nd | nd | nd | nd | nd | nd | nd | mg/L |
| BENALAXYL | nd | nd | nd | nd | nd | nd | nd | nd | mg/L |
| PIRACLOSTRIBIN | nd | nd | nd | nd | nd | nd | nd | nd | mg/L |
| METRAFENONA | nd | nd | nd | nd | nd | nd | nd | nd | mg/L |
| QUINOXIFEN | nd | nd | nd | nd | nd | nd | nd | nd | mg/L |
| MEPTILDINOCAP | nd | nd | nd | nd | nd | nd | nd | nd | mg/L |
| Cobre | 15,37 | 17,82 | 16,64 | 58,04 | 14,43 | 23,38 | 53,16 | 69,10 | ng/mL |
| Azufre | 18,02 | 16,48 | 13,87 | 21,63 | 29,73 | 26,62 | 27,96 | 28,18 | µg/mL |
| Fosetil-Al | nd | nd | nd | nd | nd | nd | nd | nd | µg/mL |
| CS ₂ total | nd | nd | nd | nd | nd | nd | nd | nd | µg/mL |

Residuo cero

parcela de AIA

| SUELOS | A1 | A2 | A3 | A4 | A5 | A6 | A7 | A8 | A9 | A10 | A11 | UNIDADES |
|-----------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----------|
| CIMOXANILO | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | µg/g |
| METALAXYL | <LOQ | 0,02 | <LOQ | <LOQ | 0,02 | <LOQ | <LOQ | <LOQ | <LOQ | <LOQ | <LOQ | µg/g |
| DIMETOMORPH1 | <LOQ | 0,04 | 0,02 | <LOQ | 0,05 | 0,03 | <LOQ | 0,04 | 0,02 | <LOQ | 0,05 | µg/g |
| TRIADIMENOL 1 | nd | 0,05 | nd | nd | 0,02 | nd | nd | 0,04 | <LOQ | 0,02 | 0,08 | µg/g |
| IPROVALICARB | nd | nd | nd | nd | nd | nd | nd | <LOQ | nd | nd | nd | µg/g |
| BOSCALIDA | <LOQ | 0,02 | <LOQ | <LOQ | 0,03 | <LOQ | <LOQ | 0,04 | 0,03 | 0,05 | 0,08 | µg/g |
| FOLPET | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | µg/g |
| TEBUCONAZOL | nd | <LOQ | nd | nd | nd | nd | nd | nd | nd | nd | 0,06 | µg/g |
| PENCONAZOL | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | µg/g |
| CIAZOFAMIDA | nd | <LOQ | <LOQ | nd | <LOQ | <LOQ | nd | <LOQ | <LOQ | nd | <LOQ | µg/g |
| BENALAXYL | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | µg/g |
| PIRACLOSTRIBIN | nd | nd | nd | nd | <LOQ | nd | nd | nd | nd | nd | nd | µg/g |
| METRAFENONA | nd | nd | nd | nd | <LOQ | nd | nd | nd | nd | nd | nd | µg/g |
| QUINOXIFEN | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | µg/g |
| MEPTILDINOCAP | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | µg/g |
| Cobre | 91,66 | 85,36 | 64,56 | 75,25 | 91,08 | 94,68 | 66,39 | 60,27 | 86,08 | 86,78 | 86,91 | µg/g |
| Azufre | <LOQ | <LOQ | <LOQ | <LOQ | <LOQ | <LOQ | <LOQ | <LOQ | <LOQ | <LOQ | <LOQ | µg/g |
| Fosetil-Al | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | µg/g |
| CS ₂ total | <LOQ | <LOQ | <LOQ | <LOQ | 0,15 | <LOQ | 0,09 | 0,25 | <LOQ | <LOQ | 0,16 | µg/g |

LOQ= 1 mg/L

LOQ= 400

| UVAS | A1 | A2 | A3 | A4 | A5 | A6 | A7 | A8 | A9 | A10 | A11 | UNIDADES |
|-----------------------|------|------|------|------|------|------|------|------|------|------|------|----------|
| CIMOXANILO | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | µg/g |
| METALAXYL | <loq | <loq | <loq | <loq | <loq | <loq | <loq | <loq | <loq | nd | <loq | µg/g |
| DIMETOMORPH1 | 0,09 | <loq | 0,04 | <loq | 0,12 | 0,06 | <loq | 0,07 | 0,08 | <loq | 0,15 | µg/g |
| TRIADIMENOL 1 | 0,02 | nd | nd | nd | 0,02 | nd | nd | 0,02 | 0,04 | 0,04 | 0,07 | µg/g |
| IPROVALICARB | 0,12 | <loq | 0,01 | <loq | 0,12 | 0,02 | <loq | 0,14 | 0,01 | <loq | 0,12 | µg/g |
| BOSCALIDA | 0,02 | nd | nd | nd | 0,03 | nd | nd | 0,03 | 0,06 | 0,05 | 0,07 | µg/g |
| FOLPET | 0,32 | nd | nd | nd | 0,32 | nd | nd | 0,44 | nd | nd | 0,29 | µg/g |
| TEBUCONAZOL | <loq | nd | nd | nd | <loq | nd | <loq | <loq | nd | nd | 0,06 | µg/g |
| PENCONAZOL | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | µg/g |
| CIAZOFAMIDA | 0,15 | nd | 0,03 | nd | 0,17 | 0,06 | nd | 0,24 | 0,04 | nd | 0,26 | µg/g |
| BENALAXYL | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | µg/g |
| PIRACLOSTRIBIN | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | µg/g |
| METRAFENONA | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | µg/g |
| QUINOXIFEN | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | µg/g |
| MEPTILDINOCAP | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | µg/g |
| Cobre | 2,10 | 2,40 | 1,04 | 3,16 | 2,57 | 0,91 | 3,48 | 4,55 | 0,64 | 2,54 | 2,30 | µg/g |
| Azufre | <LOQ | <LOQ | <LOQ | <LOQ | <LOQ | <LOQ | <LOQ | <LOQ | <LOQ | <LOQ | <LOQ | µg/g |
| Fosetil-Al | 0,10 | nd | nd | nd | 0,13 | nd | nd | 0,10 | nd | nd | nd | µg/g |
| CS ₂ total | 4,66 | nd | nd | nd | 4,23 | nd | nd | 3,79 | nd | nd | 5,93 | µg/g |

Residuo cero

| MOSTOS | A1 | A2 | A3 | A4 | A5 | A6 | A7 | A8 | A9 | A10 | A11 | UNIDADES |
|-----------------------|-------|-------|------|-------|-------|------|-------|-------|------|-------|-------|----------|
| CIMOXANILO | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | µg/ml |
| METALAXYL | <loq | <loq | <loq | <loq | <loq | <loq | <loq | <loq | <loq | <loq | <loq | µg/ml |
| DIMETOMORPH1 | 0,45 | 0,22 | 0,12 | 0,05 | 0,55 | 0,11 | 0,02 | 0,29 | 0,30 | 0,06 | 0,44 | µg/ml |
| TRIADIMENOL 1 | 0,05 | 0,02 | <loq | <loq | 0,04 | nd | nd | 0,03 | 0,04 | 0,03 | 0,08 | µg/ml |
| IPROVALICARB | 0,85 | 0,31 | 0,06 | 0,09 | 0,63 | 0,07 | 0,03 | 0,55 | 0,11 | 0,05 | 0,38 | µg/ml |
| BOSCALIDA | 0,05 | 0,03 | nd | 0,02 | 0,09 | nd | 0,01 | 0,07 | 0,18 | 0,14 | 0,22 | µg/ml |
| FOLPET | 1,72 | 0,38 | 0,10 | 0,13 | 0,75 | 0,09 | nd | 0,50 | 0,15 | nd | 0,44 | µg/ml |
| TEBUCONAZOL | <loq | <loq | <loq | <loq | 0,02 | nd | nd | <loq | <loq | <loq | 0,16 | µg/ml |
| PENCONAZOL | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | µg/ml |
| CIAZOFAMIDA | 1,19 | 0,44 | 0,22 | 0,10 | 1,29 | 0,23 | 0,02 | 1,35 | 0,41 | 0,09 | 2,78 | µg/ml |
| BENALAXYL | <loq | <loq | <loq | <loq | <loq | <loq | <loq | <loq | <loq | <loq | <loq | µg/ml |
| PIRACLOSTRIBIN | nd | nd | nd | <loq | nd | nd | nd | nd | nd | nd | nd | µg/ml |
| METRAFENONA | nd | nd | nd | <loq | nd | nd | nd | nd | nd | nd | nd | µg/ml |
| QUINOXIFEN | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | µg/ml |
| MEPTILDINOCAP | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | µg/ml |
| Cobre | 10,79 | 10,06 | 4,06 | 12,17 | 10,58 | 3,03 | 12,12 | 14,70 | 3,91 | 10,45 | 6,32 | µg/ml |
| Azufre | <LOQ | <LOQ | <LOQ | <LOQ | <LOQ | <LOQ | <LOQ | <LOQ | <LOQ | <LOQ | <LOQ | µg/ml |
| Fosetil-Al | 0,06 | nd | nd | nd | 0,08 | nd | nd | 0,03 | nd | nd | 0,04 | µg/ml |
| CS ₂ total | 14,74 | 4,50 | nd | 1,83 | 17,80 | nd | 0,47 | 17,01 | 2,22 | 0,98 | 17,35 | µg/ml |

parcela de AIA

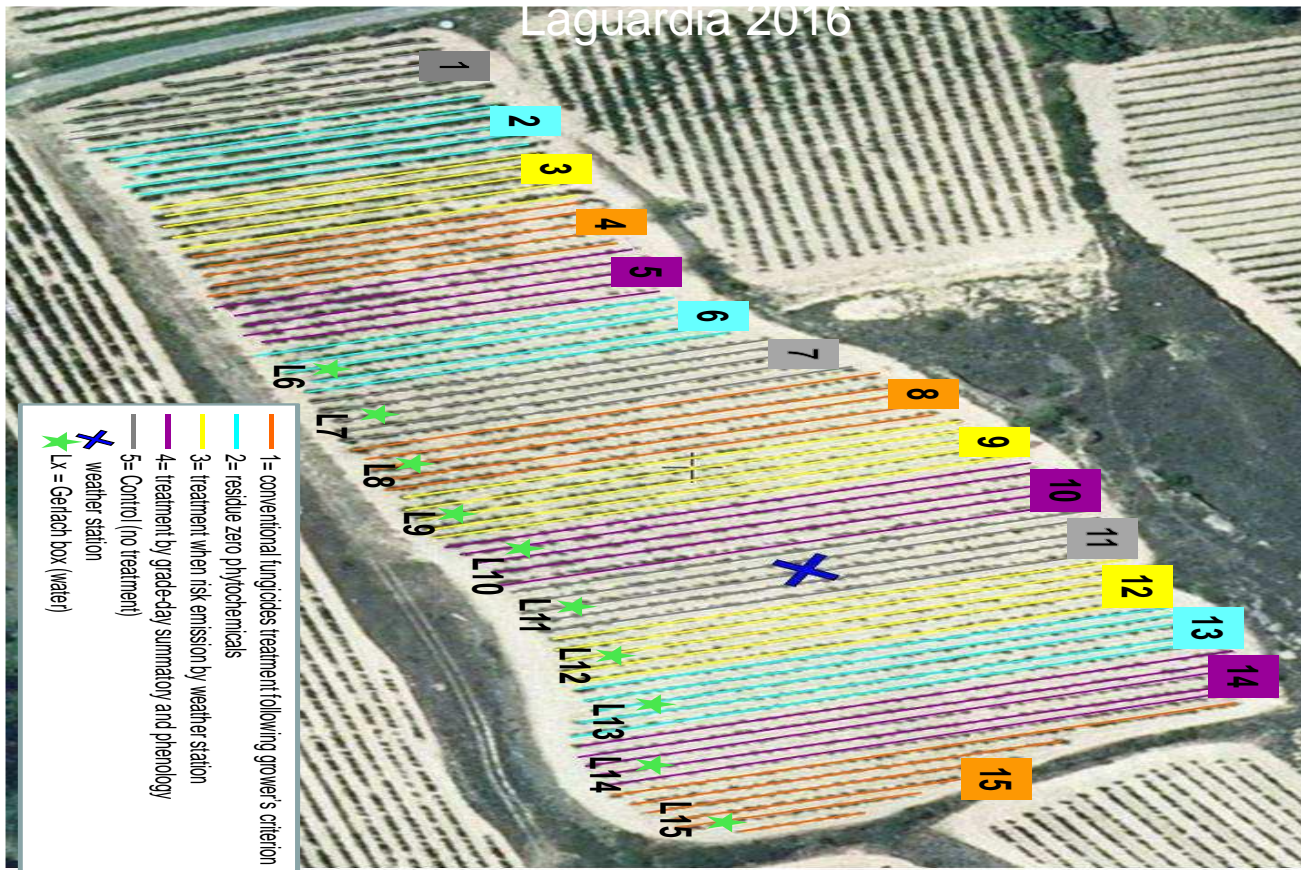
| VINOS | A1 | A2 | A3 | A4 | A5 | A6 | A7 | A8 | A9 | A10 | A11 | UNIDADES |
|-----------------------|------|------|------|------|------|------|------|------|------|------|------|----------|
| CIMOXANILO | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | µg/ml |
| METALAXYL | 0,02 | 0,01 | <loq | <loq | 0,02 | <loq | <loq | 0,02 | <loq | <loq | <loq | µg/ml |
| DIMETOMORPH1 | 0,19 | 0,05 | 0,07 | 0,02 | 0,24 | 0,06 | 0,02 | 0,12 | 0,12 | 0,03 | 0,16 | µg/ml |
| TRIADIMENOL 1 | 0,05 | 0,01 | <loq | <loq | 0,04 | <loq | <loq | 0,03 | 0,04 | 0,04 | 0,06 | µg/ml |
| IPROVALICARB | 0,58 | 0,12 | 0,06 | 0,06 | 0,50 | 0,06 | 0,02 | 0,39 | 0,06 | 0,02 | 0,25 | µg/ml |
| BOSCALIDA | 0,03 | <loq | <loq | <loq | 0,05 | <loq | <loq | 0,04 | 0,08 | 0,07 | 0,09 | µg/ml |
| FOLPET | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | µg/ml |
| TEBUCONAZOL | <loq | <loq | nd | nd | <loq | nd | nd | <loq | nd | nd | 0,05 | µg/ml |
| PENCONAZOL | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | µg/ml |
| CIAZOFAMIDA | 0,06 | 0,02 | 0,02 | 0,01 | 0,09 | 0,02 | <loq | 0,09 | 0,02 | <loq | 0,14 | µg/ml |
| BENALAXYL | <loq | <loq | <loq | <loq | <loq | <loq | <loq | <loq | <loq | <loq | <loq | µg/ml |
| PIRACLOSTRIBIN | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | µg/ml |
| METRAFENONA | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | µg/ml |
| QUINOXIFEN | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | µg/ml |
| MEPTILDINOCAP | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | µg/ml |
| Cobre | 0,06 | 0,13 | 0,03 | 0,09 | 0,07 | <LOQ | 1,28 | 0,09 | 0,08 | 0,20 | 0,10 | µg/ml |
| Azufre | <loq | <loq | <loq | <loq | <loq | <loq | <loq | <loq | <loq | <loq | <loq | µg/ml |
| Fosetil-Al | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | µg/ml |
| CS ₂ total | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | µg/ml |

eman ta zabal zazu

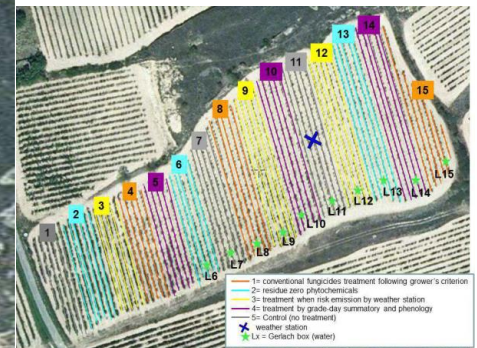


RESULTADOS y CONCLUSIONES GENERALES (parcelas)

PARCELA LAGUARDIA



Laguardia 2015



parcela de Laguardia (2016)

| FECHA | PARCELAS | PRODUCTO | MATERIA ACTIVA | DOSIS | VOL/CUBA |
|---------|----------|-------------------------|-------------------------------------------|-----------------|------------|
| 9/4/16 | TODAS | Clinic-grifosato36% | mezcla | 200ml/16l | 150l |
| 12/4/16 | todas | stomp-aqua45% | mezcla (pendimetanila) | 200ml/16l | |
| 20/5/16 | 2,6,13 | grano de oro | azufre 98,5% | 7kg | espolvoreo |
| 20/5/16 | 5,10,14 | grano de oro | azufre 98,5% | 7kg | espolvoreo |
| 20/5/16 | 4,8,15 | grano de oro | azufre 98,5% | 7kg | espolvoreo |
| 28/5/16 | 4,8,15 | manzives forte bayfidan | MANCOZEB 64% + METALAXIL 8% | 30ml | 70l |
| 2/6/16 | 5,10,14 | grano de oro | azufre 98,5% | 8kg | espolvoreo |
| 2/6/16 | 2,6,13 | jobasan | extracto | 230ml/hl | 80l |
| 7/6/16 | 3,9,12 | cabrio top | 55 % Metiram + 5 % Piraclostrobin | 100g/hl | 90l |
| 16/6/16 | 4,8,15 | fantic f-arius | BENALAXIL-M 3,75% + FOLPET 48% | 30ml/hl | 90l |
| 20/6/16 | 2,6,13 | heliosufre | azufre 72% | 600ml/hl | 100l |
| 20/6/16 | 3,9,12 | dorado | Penconazol 10% | 40ml/hl | 100l |
| 21/6/16 | 5,10,14 | grano de oro | azufre 98,5% | 6kg | espolvoreo |
| 30/6/16 | 3,9,12 | vivando | METRAFENONA 50% | 20ml/hl | 100l |
| 7/7/16 | 4,8,15 | cyclo plus collis | FOLPET 40% + METALAXIL 10% + Boscalida | 60ml/hl | 100l |
| 7/7/16 | 2,6,13 | heliosufre | azufre 72% | 600ml/hl | 100l |
| 8/7/16 | 5,10,14, | grano de oro | azufre 98,5% | 6kg | espolvoreo |
| 20/7/16 | TODAS | manzivex forte cobresta | MANCOZEB 64% + METALAXIL 8% + cobre | 2,5 kg/Ha 2 l/l | 420l |
| 30/7/16 | 2,6,13 | heliosufre | azufre 72% | 600ml/hl | 100l |
| 30/7/16 | 3,9,12 | arius | QUINOXIFEN 25% | 0,3 l/ha | 100l |
| 3/8/16 | 4,8,15 | cabrio top | 55 % Metiram + 5 % Piraclostrobin | 1,5kg/ha | 110l |
| 11/8/16 | 5,10,14 | grano de oro | azufre 98,5% | 6kg | espolvoreo |
| 11/8/16 | 2,6,13 | heliosufre | azufre 72% | 600ml/ha | 110l |
| 11/8/16 | 3,9,12 | darcos | TEBUCONAZOL 25% | 115l/ha | 110l |
| 21/8/16 | 4,8,15 | sulfato cuprocalcico 20 | sulfato cuprocalcico 20% + Penconazol 10% | 40ml/hl | 110l |
| 19/9/16 | 1,7,11 | AQ 10 | | 15g | 150l |
| 19/9/16 | 2,6,13 | AQ 10 | | 15g | 150l |

parcela de Laguardia

Residuo cero

Control

| AGUAS | L6 | L7 | L8 | L9 | L10 | L11 | L12 | L13 | L14 | L15 | UNIDADES |
|-----------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----------|
| CIMOXANILO | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | mg/L |
| METALAXYL | 0,042 | 0,029 | 0,034 | 0,041 | 0,022 | 0,029 | 0,030 | 0,059 | 0,044 | 0,038 | mg/L |
| DIMETOMORPH1 | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | mg/L |
| TRIADIMENOL 1 | nd | nd | 0,025 | nd | nd | nd | nd | nd | nd | 0,030 | mg/L |
| IPROVALICARB | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | mg/L |
| BOSCALIDA | nd | nd | 0,037 | nd | nd | nd | nd | nd | nd | nd | mg/L |
| FOLPET | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | mg/L |
| TEBUCONAZOL | nd | nd | nd | <loq | nd | nd | nd | nd | nd | nd | mg/L |
| PENCONAZOL | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | mg/L |
| CIANOFAMIDA | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | mg/L |
| BENALAXYL | nd | nd | <loq | nd | nd | nd | nd | nd | nd | <loq | mg/L |
| PIRACLOSTRIBIN | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | mg/L |
| METRAFENONA | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | mg/L |
| QUINOXIFEN | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | mg/L |
| MEPTILDINOCAP | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | mg/L |
| Cobre | 5,22 | 58,87 | 14,14 | 21,09 | 61,17 | 71,05 | 52,20 | 7,63 | 22,21 | 1,83 | ng/mL |
| Azufre | 41,08 | 11,54 | 20,93 | 24,56 | 66,01 | 35,76 | 17,73 | 55,65 | 46,06 | 14,45 | µg/mL |
| Fosetil-Al | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | µg/mL |
| CS ₂ total | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | µg/mL |

| SUELOS | L1 | L2 | L3 | L4 | L5 | L6 | L7 | L8 | L9 | L10 | L11 | L12 | L13 | L14 | L15 | UNIDADES |
|-----------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----------|
| CIMOXANILO | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | µg/g |
| METALAXYL | 0,03 | 0,04 | 0,04 | 0,04 | 0,04 | 0,05 | 0,04 | 0,07 | 0,05 | 0,04 | 0,04 | 0,04 | 0,05 | 0,04 | 0,03 | µg/g |
| DIMETOMORPH1 | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | <LOQ | nd | µg/g |
| TRIADIMENOL 1 | nd | nd | <LOQ | 0,024 | <LOQ | nd | nd | 0,04 | <LOQ | nd | nd | nd | nd | nd | <LOQ | µg/g |
| IPROVALICARB | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | µg/g |
| BOSCALIDA | 0,03 | 0,03 | 0,03 | 0,10 | 0,02 | 0,03 | 0,04 | 0,07 | 0,05 | 0,02 | 0,03 | 0,04 | 0,03 | 0,06 | 0,03 | µg/g |
| FOLPET | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | µg/g |
| TEBUCONAZOL | nd | nd | <LOQ | nd | nd | nd | nd | nd | <LOQ | nd | nd | <LOQ | nd | nd | <LOQ | µg/g |
| PENCONAZOL | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | µg/g |
| CIANOFAMIDA | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | µg/g |
| BENALAXYL | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | µg/g |
| PIRACLOSTRIBIN | nd | nd | nd | <LOQ | nd | nd | nd | <LOQ | nd | nd | nd | nd | nd | nd | <LOQ | µg/g |
| METRAFENONA | <LOQ | nd | nd | <LOQ | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | µg/g |
| QUINOXIFEN | nd | nd | nd | <LOQ | nd | nd | nd | <LOQ | nd | nd | nd | nd | nd | nd | <LOQ | µg/g |
| MEPTILDINOCAP | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | µg/g |
| Cobre | 86,39 | 79,95 | 68,37 | 65,99 | 43,86 | 47,60 | 45,98 | 51,53 | 53,46 | 37,33 | 55,14 | 43,59 | 40,80 | 25,63 | 29,03 | µg/g |
| Azufre | <LOQ | <LOQ | <LOQ | <LOQ | <LOQ | <LOQ | <LOQ | <LOQ | <LOQ | <LOQ | <LOQ | <LOQ | <LOQ | <LOQ | <LOQ | µg/g |
| Fosetil-Al | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | µg/g |
| CS ₂ total | <LOQ | <LOQ | <LOQ | <LOQ | <LOQ | <LOQ | <LOQ | <LOQ | <LOQ | <LOQ | <LOQ | <LOQ | <LOQ | <LOQ | <LOQ | µg/g |

LOQ= 400

eman ta zabal zazu



Residuo cero

Control

LOQ= 200

| UVAS | L1 | L2 | L3 | L4 | L5 | L6 | L7 | L8 | L9 | L10 | L11 | L12 | L13 | L14 | L15 | UNIDADES |
|-----------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|----------|
| CIMOXANILO | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | µg/g |
| METALAXYL | 0,14 | 0,16 | 0,32 | 0,26 | 0,13 | 0,12 | 0,12 | 0,16 | 0,19 | 0,13 | 0,13 | 0,07 | 0,03 | <loq | 0,11 | µg/g |
| DIMETOMORPH1 | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | µg/g |
| TRIADIMENOL 1 | nd | nd | nd | <loq | nd | nd | nd | <loq | nd | nd | nd | nd | nd | nd | nd | µg/g |
| IPROVALICARB | <loq | <loq | <loq | <loq | <loq | <loq | <loq | <loq | <loq | <loq | <loq | <loq | <loq | <loq | <loq | µg/g |
| BOSCALIDA | nd | nd | nd | 0,07 | nd | nd | nd | 0,02 | nd | nd | nd | nd | nd | nd | 0,02 | µg/g |
| FOLPET | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | µg/g |
| TEBUCONAZOL | <loq | <loq | 0,32 | <loq | nd | nd | <loq | <loq | 0,07 | nd | nd | 0,07 | <loq | nd | nd | µg/g |
| PENCONAZOL | nd | nd | nd | <loq | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | <loq | µg/g |
| CIANOFAMIDA | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | µg/g |
| BENALAXYL | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | µg/g |
| PIRACLOSTRIBIN | <loq | <loq | <loq | 0,01 | <loq | <loq | <loq | 0,01 | <loq | <loq | <loq | <loq | <loq | <loq | <loq | µg/g |
| METRAFENONA | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | µg/g |
| QUINOXIFEN | nd | nd | 0,02 | nd | nd | nd | nd | <loq | <loq | nd | nd | <loq | nd | nd | <loq | µg/g |
| MEPTILDINOCAP | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | µg/g |
| Cobre | 1,49 | <loq | 1,02 | 0,71 | 1,10 | <loq | 0,65 | 0,62 | 0,36 | <LOQ | <loq | <loq | 0,28 | <loq | 0,23 | µg/g |
| Azufre | <LOQ | <LOQ | <LOQ | <LOQ | <LOQ | <LOQ | <LOQ | <LOQ | <LOQ | <LOQ | <LOQ | <LOQ | <LOQ | <LOQ | <LOQ | µg/g |
| Fosetil-Al | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | µg/g |
| CS ₂ total | 2,06 | 1,29 | 2,17 | 1,26 | 1,23 | 1,32 | 1,57 | 2,03 | 1,46 | 1,19 | 1,45 | 1,15 | 0,63 | 0,97 | 0,88 | µg/g |

LOQ= 200

| MOSTOS | L1 | L2 | L3 | L4 | L5 | L6 | L7 | L8 | L9 | L10 | L11 | L12 | L13 | L14 | L15 | UNIDADES |
|-----------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|----------|
| CIMOXANILO | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | µg/ml |
| METALAXYL | 0,09 | 0,09 | 0,09 | 0,22 | 0,10 | 0,10 | 0,08 | 0,11 | 0,13 | 0,16 | 0,18 | 0,16 | 0,09 | 0,15 | 0,29 | µg/ml |
| DIMETOMORPH1 | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | µg/ml |
| TRIADIMENOL 1 | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | µg/ml |
| IPROVALICARB | <loq | <loq | <loq | <loq | <loq | <loq | <loq | <loq | <loq | <loq | <loq | <loq | <loq | <loq | <loq | µg/ml |
| BOSCALIDA | nd | nd | nd | 0,24 | nd | nd | <loq | 0,12 | <loq | nd | nd | nd | nd | nd | 0,25 | µg/ml |
| FOLPET | nd | nd | nd | 0,15 | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | 0,11 | µg/ml |
| TEBUCONAZOL | <loq | nd | 0,02 | <loq | <loq | <loq | <loq | <loq | 0,02 | <loq | <loq | 0,02 | <loq | <loq | <loq | µg/ml |
| PENCONAZOL | nd | nd | nd | <loq | nd | nd | nd | <loq | nd | nd | nd | nd | nd | nd | <loq | µg/ml |
| CIANOFAMIDA | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | µg/ml |
| BENALAXYL | nd | nd | nd | <loq | <loq | <loq | <loq | <loq | nd | nd | <loq | <loq | <loq | <loq | <loq | µg/ml |
| PIRACLOSTRIBIN | nd | <loq | <loq | 0,03 | <loq | <loq | <loq | 0,03 | <loq | <loq | <loq | <loq | <loq | <loq | 0,04 | µg/ml |
| METRAFENONA | nd | nd | <loq | nd | nd | nd | nd | <loq | 0,01 | <loq | <loq | 0,01 | <loq | <loq | <loq | µg/ml |
| QUINOXIFEN | nd | nd | nd | <loq | nd | nd | nd | <loq | <loq | nd | nd | <loq | nd | nd | <loq | µg/ml |
| MEPTILDINOCAP | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | µg/ml |
| Cobre | 1,70 | 1,55 | 1,22 | 2,99 | 1,22 | 1,47 | 1,66 | 2,22 | 1,47 | 1,53 | 1,10 | 1,70 | 0,41 | 1,69 | 1,41 | µg/ml |
| Azufre | <LOQ | <LOQ | <LOQ | <LOQ | <LOQ | <LOQ | <LOQ | <LOQ | <LOQ | <LOQ | <LOQ | <LOQ | <LOQ | <LOQ | <LOQ | µg/ml |
| Fosetil-Al | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | µg/ml |
| CS ₂ total | 0,39 | 0,56 | 1,77 | 4,46 | 4,17 | 5,39 | 4,67 | 4,94 | 3,04 | 2,93 | 2,99 | 3,76 | 1,71 | 2,22 | 0,59 | µg/ml |

LOQ=62,5

| VINOS | L1 | L2 | L3 | L4 | L5 | L6 | L7 | L8 | L9 | L10 | L11 | L12 | L13 | L14 | L15 | UNIDADES |
|-----------------------|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|----------|
| CIMOXANILO | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | µg/mL |
| METALAXYL | 0,24 | 0,13 | 0,07 | 0,05 | 0,10 | 0,06 | 0,03 | 0,03 | 0,12 | 0,11 | 0,16 | 0,14 | 0,08 | 0,14 | 0,33 | µg/mL |
| DIMETOMORPH1 | <loq | <loq | <loq | <loq | <loq | <loq | <loq | <loq | <loq | <loq | <loq | <loq | <loq | <loq | <loq | µg/mL |
| TRIADIMENOL 1 | <loq | <loq | <loq | <loq | <loq | <loq | <loq | <loq | <loq | <loq | <loq | <loq | <loq | <loq | <loq | µg/mL |
| IPROVALICARB | <loq | <loq | <loq | <loq | <loq | <loq | <loq | 0,01 | <loq | <loq | <loq | <loq | <loq | <loq | <loq | µg/mL |
| BOSCALIDA | <loq | <loq | <loq | 0,05 | <loq | <loq | <loq | 0,02 | <loq | <loq | <loq | <loq | <loq | <loq | 0,08 | µg/mL |
| FOLPET | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | µg/mL |
| TEBUCONAZOL | <loq | nd | 0,02 | nd | nd | nd | nd | <loq | 0,01 | nd | <loq | 0,02 | nd | nd | nd | µg/mL |
| PENCONAZOL | nd | nd | nd | <loq | nd | nd | nd | <loq | nd | nd | nd | nd | nd | nd | nd | µg/mL |
| CIANOFAMIDA | nd | nd | nd | nd | nd | nd | nd | 0,01 | nd | nd | nd | nd | nd | nd | nd | µg/mL |
| BENALAXYL | <loq | <loq | <loq | <loq | <loq | <loq | <loq | <loq | <loq | <loq | <loq | <loq | <loq | <loq | <loq | µg/mL |
| PIRACLOSTRIBIN | nd | nd | nd | <loq | <loq | nd | nd | <loq | nd | <loq | nd | nd | nd | nd | <loq | µg/mL |
| METRAFENONA | nd | nd | <loq | <loq | <loq | nd | nd | <loq | <loq | nd | nd | <loq | nd | nd | nd | µg/mL |
| QUINOXIFEN | nd | nd | nd | nd | nd | nd | nd | <loq | nd | nd | nd | nd | nd | nd | nd | µg/mL |
| MEPTILDINOCAP | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | µg/mL |
| Cobre | <loq | <loq | <loq | <loq | <loq | <loq | <loq | <loq | <loq | <loq | <loq | <loq | <loq | <loq | <loq | µg/mL |
| Azufre | 89,39 | 124,49 | 104,92 | 120,39 | 150,74 | 137,49 | 145,86 | 112,68 | 117,26 | 130,93 | 132,84 | 114,23 | 134,70 | 154,76 | 142,50 | µg/mL |
| Fosetil-Al | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | µg/mL |
| CS ₂ total | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | µg/mL |

eman ta zabal zazu



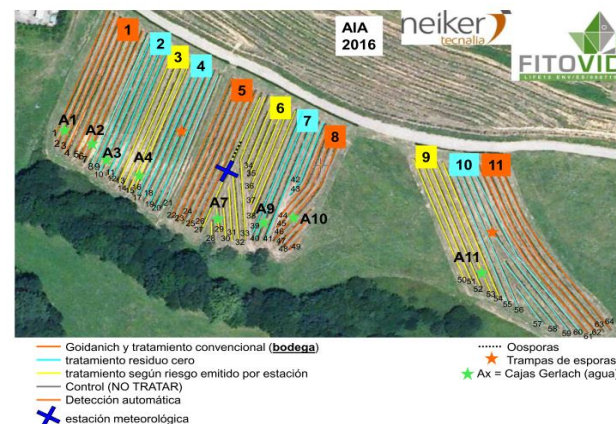
RESULTADOS Y CONCLUSIONES (SUBPARCELAS)

TRATAMIENTO RESIDUO CERO –AIA-

| | | METALAXYL | DIMETOMORPH | TRIADIMENOL | IPROVALICARB | BOSCALIDA | FOLPET | TEBUCONAZOL | CIANOFAMIDA | BENALAXYL | PIRACLOSTR | METRAFENONA | Cu | S | CS2 total |
|--------|-----|-----------|-------------|-------------|--------------|-----------|--------|-------------|-------------|-----------|------------|-------------|-------|-------|-----------|
| AGUAS | A3 | nd | <loq | nd | nd | nd | nd | nd | nd | nd | nd | nd | 16,64 | 13,87 | nd |
| | A9 | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | 23,38 | 26,62 | nd |
| SUELOS | A2 | 0,02 | 0,04 | 0,05 | nd | 0,02 | nd | <LOQ | <LOQ | nd | nd | nd | 85,36 | <LOQ | <LOQ |
| | A4 | <LOQ | <LOQ | nd | nd | <LOQ | nd | nd | nd | nd | nd | nd | 75,25 | <LOQ | <LOQ |
| | A7 | <LOQ | <LOQ | nd | nd | <LOQ | nd | nd | nd | nd | nd | nd | 66,39 | <LOQ | 0,09 |
| | A10 | <LOQ | <LOQ | 0,02 | nd | 0,05 | nd | nd | nd | nd | nd | nd | 86,78 | <LOQ | <LOQ |
| UVAS | A2 | <loq | <loq | nd | <loq | nd | nd | nd | nd | nd | nd | nd | 2,40 | <LOQ | nd |
| | A4 | <loq | <loq | nd | <loq | nd | nd | nd | nd | nd | nd | nd | 3,16 | <LOQ | nd |
| | A7 | <loq | <loq | nd | <loq | nd | nd | <loq | nd | nd | nd | nd | 3,48 | <LOQ | nd |
| | A10 | nd | <loq | 0,04 | <loq | 0,05 | nd | nd | nd | nd | nd | nd | 2,54 | <LOQ | nd |
| MOSTOS | A2 | <loq | 0,22 | 0,02 | 0,31 | 0,03 | 0,38 | <loq | 0,44 | <loq | nd | nd | 10,06 | <LOQ | 4,50 |
| | A4 | <loq | 0,05 | <loq | 0,09 | 0,02 | 0,13 | <loq | 0,10 | <loq | <loq | <loq | 12,17 | <LOQ | 1,83 |
| | A7 | <loq | 0,02 | nd | 0,03 | 0,01 | nd | nd | 0,02 | <loq | nd | nd | 12,12 | <LOQ | 0,47 |
| | A10 | <loq | 0,06 | 0,03 | 0,05 | 0,14 | nd | <loq | 0,09 | <loq | nd | nd | 10,45 | <LOQ | 0,98 |
| VINOS | A2 | 0,01 | 0,05 | 0,01 | 0,12 | <loq | nd | <loq | 0,02 | <loq | nd | nd | 0,13 | <loq | nd |
| | A4 | <loq | 0,02 | <loq | 0,06 | <loq | nd | nd | 0,01 | <loq | nd | nd | 0,09 | <loq | nd |
| | A7 | <loq | 0,02 | <loq | 0,02 | <loq | nd | nd | <loq | <loq | nd | nd | 1,28 | <loq | nd |
| | A10 | <loq | 0,03 | 0,04 | 0,02 | 0,07 | nd | nd | <loq | <loq | nd | nd | 0,20 | <loq | nd |

TRATAMIENTOS APLICADOS

4% cimoxanilo + 40% Mancozeb
Cobre 6%
EXTRACTO NATURAL DE MIMOSA
Sulfato Cuprocálcico 12,4%
Triadimenol 25% (Solo en A10)



RESULTADOS Y CONCLUSIONES (SUBPARCELAS)

TRATAMIENTO CONVENCIONAL BODEGA –AIA-

| | | METALAXYL | DIMETOMORPH | TRIADIMENOL | IPROVALICARB | BOSCALIDA | FOLPET | TEBUCONAZOL | CIANOFAMIDA | BENALAXYL | PIRACLOSTRIBIN | METRAFENONA | Cu | S | Fosetil-AI | CS2 total |
|--------|-----|-----------|-------------|-------------|--------------|-----------|--------|-------------|-------------|-----------|----------------|-------------|-------|-------|------------|-----------|
| AGUAS | A1 | 0,02 | 0,04 | 0,08 | <loq | 0,03 | nd | nd | nd | nd | nd | nd | 15,37 | 18,02 | nd | nd |
| | A2 | nd | <loq | 0,04 | <loq | nd | nd | nd | nd | nd | nd | nd | 17,82 | 16,48 | nd | nd |
| | A10 | nd | <loq | 0,03 | <loq | nd | nd | nd | nd | nd | nd | nd | 53,16 | 27,96 | nd | nd |
| SUELOS | A1 | <LOQ | <LOQ | nd | nd | <LOQ | nd | nd | nd | nd | nd | nd | 91,66 | <LOQ | nd | <LOQ |
| | A5 | 0,02 | 0,05 | 0,02 | nd | 0,03 | nd | nd | <LOQ | nd | <LOQ | <LOQ | 91,08 | <LOQ | nd | 0,15 |
| | A8 | <LOQ | 0,04 | 0,04 | <LOQ | 0,04 | nd | nd | <LOQ | nd | nd | nd | 60,27 | <LOQ | nd | 0,25 |
| | A11 | <LOQ | 0,05 | 0,08 | nd | 0,08 | nd | 0,06 | <LOQ | nd | nd | nd | 86,91 | <LOQ | nd | 0,16 |
| UVAS | A1 | <loq | 0,09 | 0,02 | 0,12 | 0,02 | 0,32 | <loq | 0,15 | nd | nd | nd | 2,10 | <LOQ | 0,10 | 4,66 |
| | A5 | <loq | 0,12 | 0,02 | 0,12 | 0,03 | 0,32 | <loq | 0,17 | nd | nd | nd | 2,57 | <LOQ | 0,13 | 4,23 |
| | A8 | <loq | 0,07 | 0,02 | 0,14 | 0,03 | 0,44 | <loq | 0,24 | nd | nd | nd | 4,55 | <LOQ | 0,10 | 3,79 |
| | A11 | <loq | 0,15 | 0,07 | 0,12 | 0,07 | 0,29 | 0,06 | 0,26 | nd | nd | nd | 2,30 | <LOQ | nd | 5,93 |
| MOSTOS | A1 | <loq | 0,45 | 0,05 | 0,85 | 0,05 | 1,72 | <loq | 1,19 | <loq | nd | nd | 10,79 | <LOQ | 0,06 | 14,74 |
| | A5 | <loq | 0,55 | 0,04 | 0,63 | 0,09 | 0,75 | 0,02 | 1,29 | <loq | nd | nd | 10,58 | <LOQ | 0,08 | 17,80 |
| | A8 | <loq | 0,29 | 0,03 | 0,55 | 0,07 | 0,50 | <loq | 1,35 | <loq | nd | nd | 14,70 | <LOQ | 0,03 | 17,01 |
| | A11 | <loq | 0,44 | 0,08 | 0,38 | 0,22 | 0,44 | 0,16 | 2,78 | <loq | nd | nd | 6,32 | <LOQ | 0,04 | 17,35 |
| VINOS | A1 | 0,02 | 0,19 | 0,05 | 0,58 | 0,03 | nd | <loq | 0,06 | <loq | nd | nd | 0,06 | <loq | nd | nd |
| | A5 | 0,02 | 0,24 | 0,04 | 0,50 | 0,05 | nd | <loq | 0,09 | <loq | nd | nd | 0,07 | <loq | nd | nd |
| | A8 | 0,02 | 0,12 | 0,03 | 0,39 | 0,04 | nd | <loq | 0,09 | <loq | nd | nd | 0,09 | <loq | nd | nd |
| | A11 | <loq | 0,16 | 0,06 | 0,25 | 0,09 | nd | 0,05 | 0,14 | <loq | nd | nd | 0,10 | <loq | nd | nd |

TRATAMIENTOS APLICADOS

Folpet 25% + Fosetil AI 50% + cimoxalino4%

11,3% Dimetomorf; 60.0 % p/p Folpet

4% cimoxanilo + 40% Mz

Ciazofamida

FOLPET 25% + FOSETIL-AI 50% +
IPROVALICARB 4%

Iprodiona 50%

Iprovalicarb + folpet

MANCOZEB

Meferoxam 5% + Folpet 40%

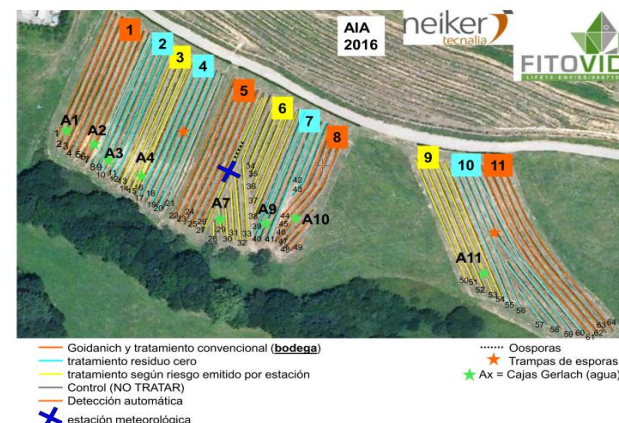
Metalaxil 8% + Mz 64%

Oxicloruro de cu 50%

Sulfato cuprocálcico

TEBUCONAZOL 25%

Triadimenol 25% (sólo en A11)



RESULTADOS Y CONCLUSIONES (SUBPARCELAS)

TRATAMIENTO SEGÚN RIESGO EMITIDO POR ESTACIÓN –AIA–

METALAXYL DIMETOMORPH TRIADIMENOL IPROVALICARB BOSCALIDA FOLPET TEBUCONAZOL CIANOFAMIDA BENALAXYL Cu S CS2 total

| | | | | | | | | | | | | | |
|--------|-----|------|------|------|------|------|------|------|------|------|-------|-------|------|
| AGUA | A4 | nd | 0,03 | nd | nd | nd | nd | nd | nd | nd | 58,04 | 21,63 | nd |
| | A7 | nd | <loq | nd | nd | nd | nd | nd | nd | nd | 14,43 | 29,73 | nd |
| | A11 | nd | 0,03 | 0,03 | <loq | nd | nd | nd | nd | nd | 69,10 | 28,18 | nd |
| SUELO | A3 | <LOQ | 0,02 | nd | nd | <LOQ | nd | nd | <LOQ | nd | 64,56 | <LOQ | <LOQ |
| | A6 | <LOQ | 0,03 | nd | nd | <LOQ | nd | nd | <LOQ | nd | 94,68 | <LOQ | <LOQ |
| | A9 | <LOQ | 0,02 | <LOQ | nd | 0,03 | nd | nd | <LOQ | nd | 86,08 | <LOQ | <LOQ |
| UVAS | A3 | <loq | 0,04 | nd | 0,01 | nd | nd | nd | 0,03 | nd | 1,04 | <LOQ | nd |
| | A6 | <loq | 0,06 | nd | 0,02 | nd | nd | nd | 0,06 | nd | 0,91 | <LOQ | nd |
| | A9 | <loq | 0,08 | 0,04 | 0,01 | 0,06 | nd | nd | 0,04 | nd | 0,64 | <LOQ | nd |
| MOSTOS | A3 | <loq | 0,12 | <loq | 0,06 | nd | 0,10 | <loq | 0,22 | <loq | 4,06 | <LOQ | nd |
| | A6 | <loq | 0,11 | nd | 0,07 | nd | 0,09 | nd | 0,23 | <loq | 3,03 | <LOQ | nd |
| | A9 | <loq | 0,30 | 0,04 | 0,11 | 0,18 | 0,15 | <loq | 0,41 | <loq | 3,91 | <LOQ | 2,22 |
| VINOS | A3 | <loq | 0,07 | <loq | 0,06 | <loq | nd | nd | 0,02 | <loq | 0,03 | <loq | nd |
| | A6 | <loq | 0,06 | <loq | 0,06 | <loq | nd | nd | 0,02 | <loq | <LOQ | <loq | nd |
| | A9 | <loq | 0,12 | 0,04 | 0,06 | 0,08 | nd | nd | 0,02 | <loq | 0,08 | <loq | nd |

TRATAMIENTOS APLICADOS

Fosetil-Al 50%+ Cimoxanilo 4%+Folpet 25%

Benalaxil 4%+ oxiclورو de cobre 33%

folpet 25% + fosetil-al 50% + iprovalicarb 4%

Folpet 30%+oxiclورو de cobre 16%

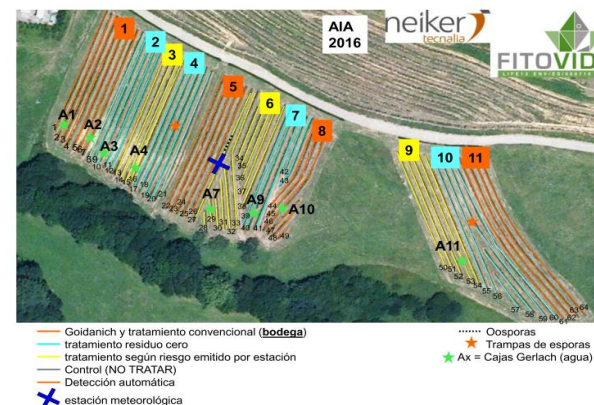
Triadimenol 25% (solo en A9 y Agua A11)

Dimetomorf 15%

Ciazofamida 2,5%

Cimoxanilo 4% + Mancozeb

Mefenoxam



RESULTADOS Y CONCLUSIONES (SUBPARCELAS)

TRATAMIENTO CONTROL -LAGUARDIA-

| | | METALAXYL | DIMETOMORPH | TRIADIMENOL | IPROVALICARB | BOSCALIDA | TEBUCONAZOL | BENALAXYL | PIRACLOSTRIBIN | METRAFENONA | Cu | S | CS2 total |
|--------|-----|-----------|-------------|-------------|--------------|-----------|-------------|-----------|----------------|-------------|-------|--------|-----------|
| AGUA | L7 | 0,03 | nd | nd | nd | nd | nd | nd | nd | nd | 58,87 | 11,54 | nd |
| | L11 | 0,03 | nd | nd | nd | nd | nd | nd | nd | nd | 71,05 | 35,76 | nd |
| SUELO | L1 | 0,03 | nd | nd | nd | 0,03 | nd | nd | nd | <LOQ | 86,39 | <LOQ | <LOQ |
| | L7 | 0,04 | nd | nd | nd | 0,04 | nd | nd | nd | nd | 45,97 | <LOQ | <LOQ |
| | L11 | 0,04 | nd | nd | nd | 0,03 | nd | nd | nd | nd | 55,14 | <LOQ | <LOQ |
| UVAS | L1 | 0,14 | nd | nd | <loq | nd | <loq | nd | <loq | nd | 1,49 | <LOQ | 2,06 |
| | L7 | 0,12 | nd | nd | <loq | nd | <loq | nd | <loq | nd | 0,65 | <LOQ | 1,57 |
| | L11 | 0,13 | nd | nd | <loq | nd | nd | nd | <loq | nd | <loq | <LOQ | 1,45 |
| MOSTOS | L1 | 0,09 | nd | nd | <loq | nd | <loq | nd | nd | nd | 1,70 | <LOQ | 0,39 |
| | L7 | 0,08 | nd | nd | <loq | <loq | <loq | <loq | <loq | nd | 1,66 | <LOQ | 4,67 |
| | L11 | 0,18 | nd | nd | <loq | nd | <loq | <loq | <loq | <loq | 1,10 | <LOQ | 2,99 |
| VINOS | L1 | 0,24 | <loq | <loq | <loq | <loq | <loq | <loq | nd | nd | <loq | 89,39 | nd |
| | L7 | 0,03 | <loq | <loq | <loq | <loq | nd | <loq | nd | nd | <loq | 145,86 | nd |
| | L11 | 0,16 | <loq | <loq | <loq | <loq | <loq | <loq | nd | nd | <loq | 132,84 | nd |

TRATAMIENTOS APLICADOS

Pendimetalina(no se analiza)
Ampelomyces quisqualis cepa M10 58%
 Mancozeb + metalaxil + cobre
 Glifosato 36% (no se analiza)



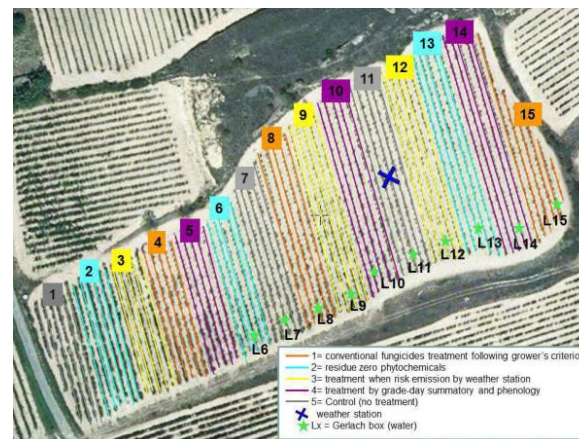
RESULTADOS y CONCLUSIONES (SUBPARCELAS)

TRATAMIENTO RESIDUO CERO –LAGUARDIA-

| | | METALAXYL | DIMETOMORPH | TRIADIMENOL | IPROVALICARB | BOSCALIDA | TEBUCONAZOL | BENALAXYL | PIRACLOSTRIBIN | METRAFENONA | Cu | S | CS2 total |
|--------|-----|-----------|-------------|-------------|--------------|-----------|-------------|-----------|----------------|-------------|-------|--------|-----------|
| AGUAS | L6 | 0,04 | nd | nd | nd | nd | nd | nd | nd | nd | 5,22 | 41,08 | nd |
| | L13 | 0,06 | nd | nd | nd | nd | nd | nd | nd | nd | 7,63 | 55,65 | nd |
| SUELOS | L2 | 0,04 | nd | nd | nd | 0,03 | nd | nd | nd | nd | 79,95 | <LOQ | <LOQ |
| | L6 | 0,05 | nd | nd | nd | 0,03 | nd | nd | nd | nd | 47,60 | <LOQ | <LOQ |
| | L13 | 0,05 | nd | nd | nd | 0,03 | nd | nd | nd | nd | 40,80 | <LOQ | <LOQ |
| UVAS | L2 | 0,16 | nd | nd | <loq | nd | <loq | nd | <loq | nd | <loq | <LOQ | 1,29 |
| | L6 | 0,12 | nd | nd | <loq | nd | nd | nd | <loq | nd | <loq | <LOQ | 1,32 |
| | L13 | 0,03 | nd | nd | <loq | nd | <loq | nd | <loq | nd | 0,28 | <LOQ | 0,63 |
| MOSTOS | L2 | 0,09 | nd | nd | <loq | nd | nd | nd | <loq | nd | 1,55 | <LOQ | 0,56 |
| | L6 | 0,10 | nd | nd | <loq | nd | <loq | <loq | <loq | nd | 1,47 | <LOQ | 5,39 |
| | L13 | 0,09 | nd | nd | <loq | nd | <loq | <loq | <loq | <loq | 0,41 | <LOQ | 1,71 |
| VINOS | L2 | 0,13 | <loq | <loq | <loq | <loq | nd | <loq | nd | nd | <loq | 124,49 | nd |
| | L6 | 0,06 | <loq | <loq | <loq | <loq | nd | <loq | nd | nd | <loq | 137,49 | nd |
| | L13 | 0,08 | <loq | <loq | <loq | <loq | nd | <loq | nd | nd | <loq | 134,70 | nd |

TRATAMIENTOS APLICADOS

GLIFOSATO 36% (no se analiza)
 PENDIMETALINA 45,5% (no se analiza)
 azufre 98,5%
 extracto VEGETAL
Ampelomyces quisqualis cepa M10 58%
 azufre 72%
 MANCOZEB+ METALAXIL+COBRE



RESULTADOS Y CONCLUSIONES (SUBPARCELAS)

TRATAMIENTO CONVENCIONAL BODEGA -LAGUARDIA-

| | | METALAXYL | DIMETOMORPH | TRIADIMENOL | IPROVALICARB | BOSCALIDA | FOLPET | TEBUCONAZOL | PENCONAZOL | CIANOFAMIDA | BENALAXYL | PIRACLOSTR | METRAFENONA | QUINOXIFEN | Cu | S | CS2 total |
|--------|-----|-----------|-------------|-------------|--------------|-----------|--------|-------------|------------|-------------|-----------|------------|-------------|------------|-------|--------|-----------|
| AGUAS | L8 | 0,03 | nd | 0,03 | nd | 0,04 | nd | nd | nd | nd | <loq | nd | nd | nd | 14,14 | 20,93 | nd |
| | L15 | 0,04 | nd | 0,03 | nd | nd | nd | nd | nd | nd | <loq | nd | nd | nd | 1,83 | 14,45 | nd |
| SUELOS | L4 | 0,04 | nd | 0,02 | nd | 0,10 | nd | nd | nd | nd | nd | <LOQ | <LOQ | <LOQ | 65,99 | <LOQ | <LOQ |
| | L8 | 0,07 | nd | 0,04 | nd | 0,07 | nd | nd | nd | nd | nd | <LOQ | nd | <LOQ | 51,53 | <LOQ | <LOQ |
| | L15 | 0,03 | nd | <LOQ | nd | 0,03 | nd | <LOQ | nd | nd | nd | <LOQ | nd | <LOQ | 29,03 | <LOQ | <LOQ |
| UVAS | L4 | 0,26 | nd | <loq | <loq | 0,07 | nd | <loq | <loq | nd | nd | 0,01 | nd | nd | 0,71 | <LOQ | 1,26 |
| | L8 | 0,16 | nd | <loq | <loq | 0,02 | nd | <loq | nd | nd | nd | 0,01 | nd | <loq | 0,62 | <LOQ | 2,03 |
| | L15 | 0,11 | nd | nd | <loq | 0,02 | nd | nd | <loq | nd | nd | <loq | nd | <loq | 0,23 | <LOQ | 0,88 |
| MOSTOS | L4 | 0,22 | nd | nd | <loq | 0,24 | 0,15 | <loq | <loq | nd | <loq | 0,03 | nd | <loq | 2,99 | <LOQ | 4,46 |
| | L8 | 0,11 | nd | nd | <loq | 0,12 | nd | <loq | <loq | nd | <loq | 0,03 | <loq | <loq | 2,22 | <LOQ | 4,94 |
| | L15 | 0,29 | nd | nd | <loq | 0,25 | 0,11 | <loq | <loq | nd | <loq | 0,04 | <loq | <loq | 1,41 | <LOQ | 0,59 |
| VINOS | L4 | 0,05 | <loq | <loq | <loq | 0,05 | nd | nd | <loq | nd | <loq | <loq | <loq | nd | <loq | 120,39 | nd |
| | L8 | 0,03 | <loq | <loq | 0,01 | 0,02 | nd | <loq | <loq | 0,01 | <loq | <loq | <loq | <loq | <loq | 112,68 | nd |
| | L15 | 0,33 | <loq | <loq | <loq | 0,08 | nd | nd | nd | nd | <loq | <loq | nd | nd | <loq | 142,50 | nd |

TRATAMIENTOS APLICADOS

PENDIMETALINA 45,5% (no se analiza)

55 % Metiram + 5 % Piraclostrobin

azufre 98,5%

BENALAXIL-M 3,75% + FOLPET 48%

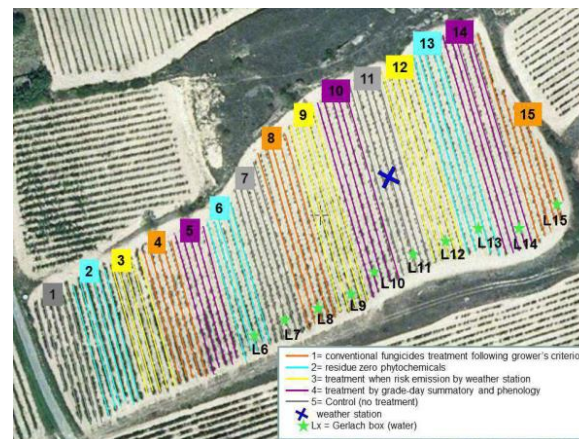
FOLPET 40% + METALAXIL 10% + BOSCALIDA + Kresoxim-methyl

GLIFOSATO 36% (no se analiza)

MANCOZEB 64% + METALAXIL 8% + triadimenol

MANCOZEB 64% + METALAXIL 8% + cobre

sulfato cuprocalcico 20% + Penconazol 10%



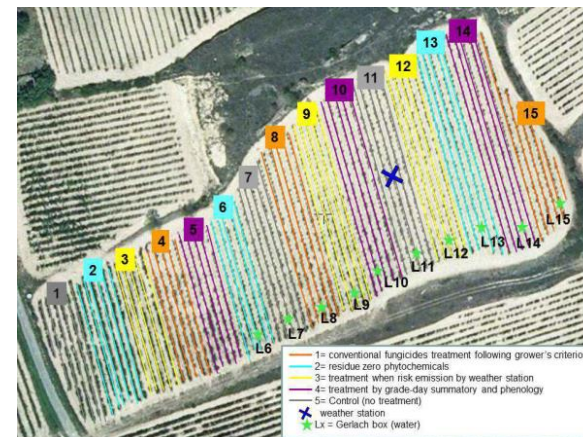
RESULTADOS y CONCLUSIONES (SUBPARCELAS)

TRATAMIENTO SEGÚN RIESGO EMITIDO POR ESTACIÓN -LAGUARDIA-

| | | METALAXYL | DIMETOMORPH | TRIADIMENOL | IPROVALICARB | BOSCALIDA | TEBUCONAZOL | BENALAXYL | PIRACLOSTRIBIN | METRAFENONA | QUINOXIFEN | Cu | S | CS2 total |
|--------|-----|-----------|-------------|-------------|--------------|-----------|-------------|-----------|----------------|-------------|------------|-------|--------|-----------|
| AGUA | L9 | 0,04 | nd | nd | nd | nd | <loq | nd | nd | nd | nd | 21,09 | 24,56 | nd |
| | L12 | 0,03 | nd | nd | nd | nd | nd | nd | nd | nd | nd | 52,20 | 17,73 | nd |
| SUELO | L3 | 0,04 | nd | <LOQ | nd | 0,03 | <LOQ | nd | nd | nd | nd | 68,37 | <LOQ | <LOQ |
| | L9 | 0,05 | nd | <LOQ | nd | 0,05 | <LOQ | nd | nd | nd | nd | 53,46 | <LOQ | <LOQ |
| | L12 | 0,04 | nd | nd | nd | 0,04 | <LOQ | nd | nd | nd | nd | 43,59 | <LOQ | <LOQ |
| UVAS | L3 | 0,32 | nd | nd | <loq | nd | 0,32 | nd | <loq | nd | 0,02 | 1,02 | <LOQ | 2,17 |
| | L9 | 0,19 | nd | nd | <loq | nd | 0,07 | nd | <loq | nd | <loq | 0,36 | <LOQ | 1,46 |
| | L12 | 0,07 | nd | nd | <loq | nd | 0,07 | nd | <loq | nd | <loq | <loq | <LOQ | 1,15 |
| MOSTOS | L3 | 0,09 | nd | nd | <loq | nd | 0,02 | nd | <loq | <loq | nd | 1,22 | <LOQ | 1,77 |
| | L9 | 0,13 | nd | nd | <loq | <loq | 0,02 | nd | <loq | 0,01 | <loq | 1,47 | <LOQ | 3,04 |
| | L12 | 0,16 | nd | nd | <loq | nd | 0,02 | <loq | <loq | 0,01 | <loq | 1,70 | <LOQ | 3,76 |
| VINOS | L3 | 0,07 | <loq | <loq | <loq | <loq | 0,02 | <loq | nd | <loq | nd | <loq | 104,92 | nd |
| | L9 | 0,12 | <loq | <loq | <loq | <loq | 0,01 | <loq | nd | <loq | nd | <loq | 117,26 | nd |
| | L12 | 0,14 | <loq | <loq | <loq | <loq | 0,02 | <loq | nd | <loq | nd | <loq | 114,23 | nd |

TRATAMIENTOS APLICADOS

Pendimetalina (no se analiza)
 Metiram 55% + Piraclostribin 5%
 Penconazol 10%
 Metrafenona 50%
 Quinoxifen 25%
 Mancozeb + metalaxil + cobre
 Tebuconazol 25%
 Glifosato 36% (no se analiza)



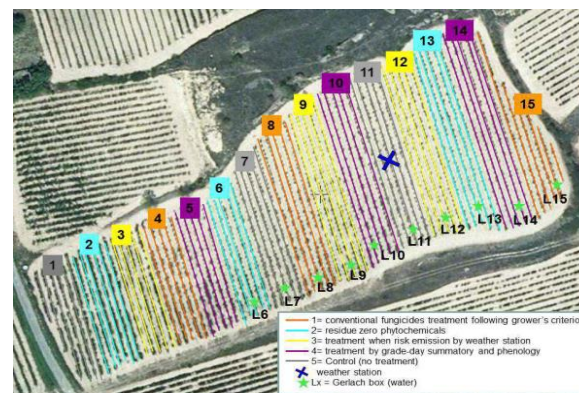
RESULTADOS Y CONCLUSIONES (SUBPARCELAS)

TRATAMIENTO GRADO/DIA -LAGUARDIA-

| | | METALAXYL | DIMETOMORPH | TRADIENOL | IPROVALICARB | BOSCALIDA | TEBUCONAZOL | BENALAXYL | PIRACLOSTRIBIN | METRAFENONA | Cu | S | CS2 total |
|--------|-----|-----------|-------------|-----------|--------------|-----------|-------------|-----------|----------------|-------------|-------|--------|-----------|
| AGUA | L10 | 0,02 | nd | nd | nd | nd | nd | nd | nd | nd | 61,17 | 66,01 | nd |
| | L14 | 0,04 | nd | nd | nd | nd | nd | nd | nd | nd | 22,21 | 46,06 | nd |
| SUELO | L5 | 0,04 | nd | <LOQ | nd | 0,02 | nd | nd | nd | nd | 43,86 | <LOQ | <LOQ |
| | L10 | 0,04 | nd | nd | nd | 0,02 | nd | nd | nd | nd | 37,33 | <LOQ | <LOQ |
| | L14 | 0,04 | <LOQ | nd | nd | 0,06 | nd | nd | nd | nd | 25,63 | <LOQ | <LOQ |
| UVAS | L5 | 0,13 | nd | nd | <loq | nd | nd | nd | <loq | nd | 1,10 | <LOQ | 1,23 |
| | L10 | 0,13 | nd | nd | <loq | nd | nd | nd | <loq | nd | <LOQ | <LOQ | 1,19 |
| | L14 | <loq | nd | nd | <loq | nd | nd | nd | <loq | nd | <loq | <LOQ | 0,97 |
| MOSTOS | L5 | 0,10 | nd | nd | <loq | nd | <loq | <loq | <loq | nd | 1,22 | <LOQ | 4,17 |
| | L10 | 0,16 | nd | nd | <loq | nd | <loq | nd | <loq | <loq | 1,53 | <LOQ | 2,93 |
| | L14 | 0,15 | nd | nd | <loq | nd | <loq | <loq | <loq | <loq | 1,69 | <LOQ | 2,22 |
| VINOS | L5 | 0,10 | <loq | <loq | <loq | <loq | nd | <loq | <loq | <loq | <loq | 150,74 | nd |
| | L10 | 0,11 | <loq | <loq | <loq | <loq | nd | <loq | <loq | nd | <loq | 130,93 | nd |
| | L14 | 0,14 | <loq | <loq | <loq | <loq | nd | <loq | nd | nd | <loq | 154,76 | nd |

TRATAMIENTOS APLICADOS

Pendimetalina (no se analiza)
 Mancozeb + metalaxil + cobre
 Glifosato 36% (no se analiza)
 Azufre 98,5%



Comparación entre Parcelas: visión general

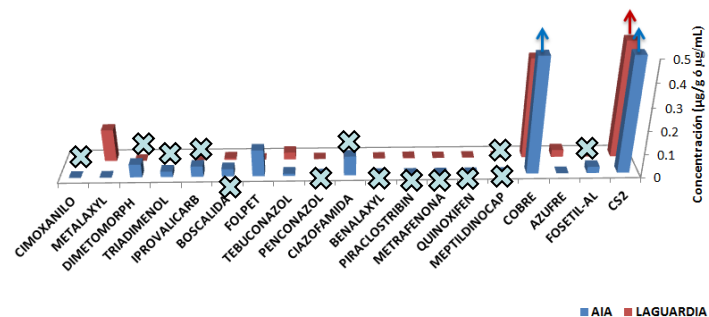
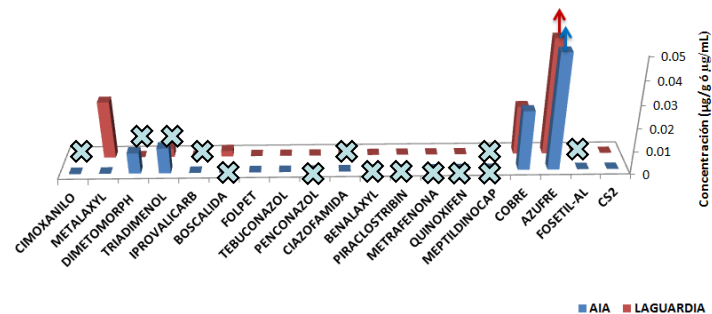
Medias de las concentraciones encontradas



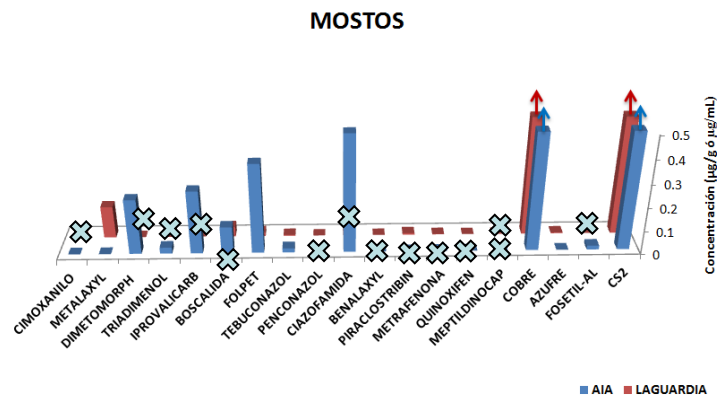
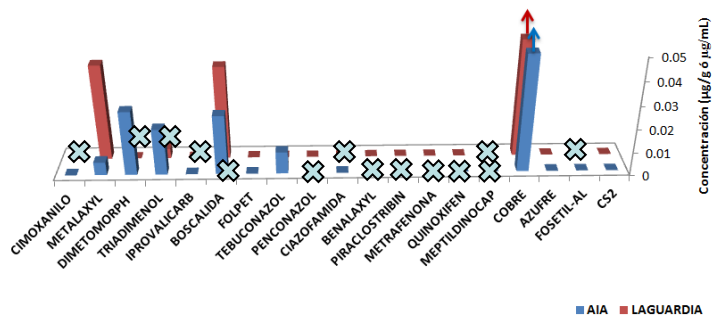
m.a. no

UVAS

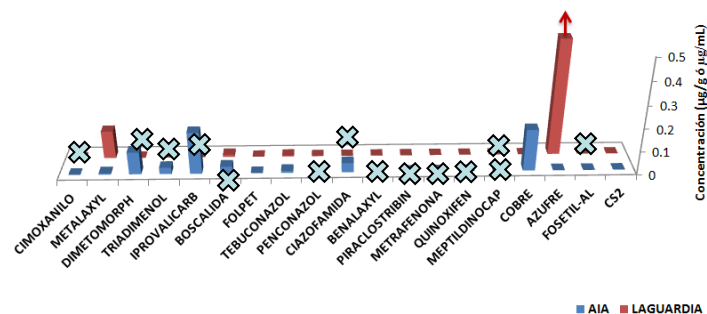
AGUA



SUELOS



VINOS



RESULTADOS y CONCLUSIONES

- Los fungicidas detectados presentan habitualmente **concentraciones inferiores a los MRLs**
- Algunos fungicidas (como son *boscalida* y *dimetomorf*) **persisten** desde la anualidad anterior ya que **son detectadas a pesar de no haber sido añadidas** por los agricultores (teniendo en cuenta los resultados de las muestras de suelo y aguas de marzo 2016, recogidas como referencia)
- En **AIA**, en la subparcela de tratamiento residuo cero, se encuentran residuos de fungicidas aplicados en las sub-parcelas colindantes.
- En **LAGUARDIA**, los resultados obtenidos se muestran de acuerdo con los tratamientos aplicados en cada sub-parcela. El *azufre* encontrado en Vino puede provenir de los sulfitos añadidos en la vinificación.
- *De forma general*, la presencia de m.a. es inferior a la de la campaña 2015, aunque el tratamiento de resultados se está realizando en estos momentos.

thank you!

eman ta zabal zazu



Universidad del País Vasco
Euskal Herriko Unibertsitatea
The University of the Basque Country