

Project Bluewater 2

Mackay and Whitsunday Isaac Paddock to Reef Forum

Presented By Adam Keilbach



Activities

- **Review current practice**
 - Product use
 - Weed control
 - Grub control
 - Spray rig assessment
- **Identify Improvements**
 - Products
 - Use Practices
 - Sprayer upgrades
 - Safe use
- **Pesticide Management Plan**
- **Extension support**



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Mackay

Far North QLD
Northern NSW

Pesticide Management Planning

- Buffer Maps
- Soils and Slopes Maps
- Weed Pressure Maps
- Pesticide Decision Support Tool
- Product Option Table
- Active Maps



Demo Folder

PCK-00000A



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- Some Pesticides have a buffer varying from 5 to 200m+ meters
- E.g., Flame (Imazapic products) have a 50m watercourse buffer.

- Buffers

- Natural Aquatic
- Wetlands and Waterways
- Vegetation
- Bystander Areas
- Livestock
- Sensitive Vegetation
- Pollinator Areas





AMICIDE

ADVANCE® 700

Boom Sprayers

DO NOT apply by a boom sprayer (except with Optical Spot Spraying Technology) unless the following requirements are met:

- Spray droplets are not smaller than a VERY COARSE spray droplet size category
- Minimum distances between the application site and downwind sensitive areas (see "Mandatory buffer zones" section of the following table titled "Buffer zones for boom sprayers") are observed.

Buffer Zones for Boom Sprayers

| Application rate | Boom Height above target canopy | Mandatory buffer zones (distances given in metres) | | | | |
|------------------|---------------------------------|--|-----------------------|------------------|------------------|-----------------|
| | | Bystander Areas | Natural Aquatic Areas | Pollinator Areas | Vegetation Areas | Livestock Areas |
| Up to 250 mL/ha | 0.5 m or lower | Not Required | Not required | Not Required | Not required | Not Required |
| | 1.0 m or lower | | 15 | | 15 | |
| Up to 500 mL/ha | 0.5 m or lower | | Not required | | Not required | |
| | 1.0 m or lower | | 30 | | 30 | |
| Up to 1 L/ha | 0.5 m or lower | | 20 | | 15 | |
| | 1.0 m or lower | | 45 | | 45 | |
| Up to 1.5 L/ha | 0.5 m or lower | | 25 | | 25 | |
| | 1.0 m or lower | | 60 | | 60 | |
| Up to 3 L/ha | 0.5 m or lower | | 35 | | 35 | |
| | 1.0 m or lower | | 110 | | 100 | |
| Up to 4 L/ha | 0.5 m or lower | 45 | 45 | | | |
| | 1.0 m or lower | 140 | 130 | | | |
| Up to 4.75 L/ha | 0.5 m or lower | 55 | 50 | | | |
| | 1.0 m or lower | 160 | 160 | | | |

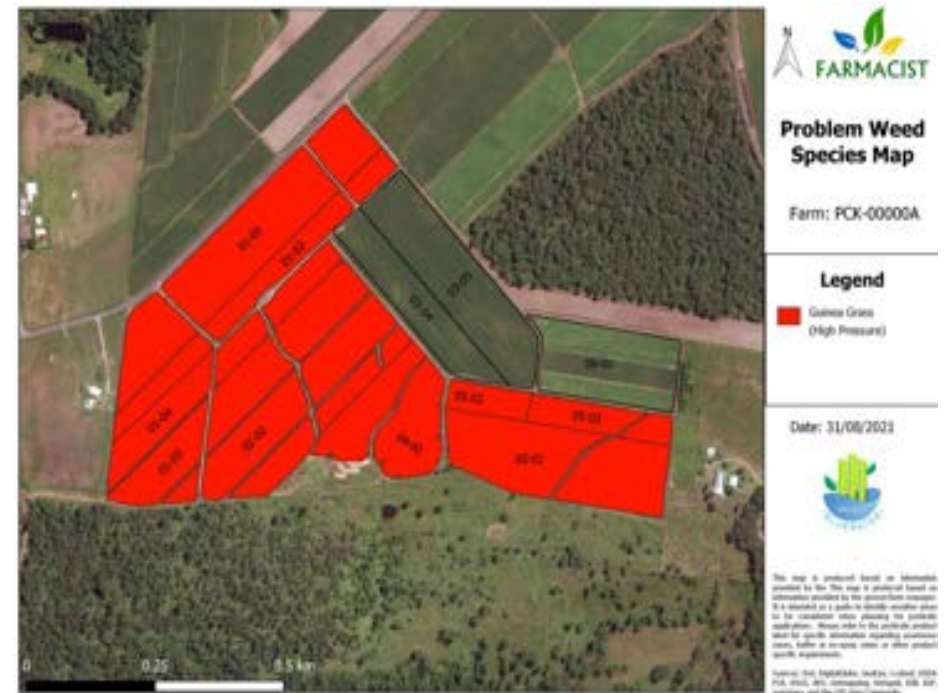


Pesticide Management Plan

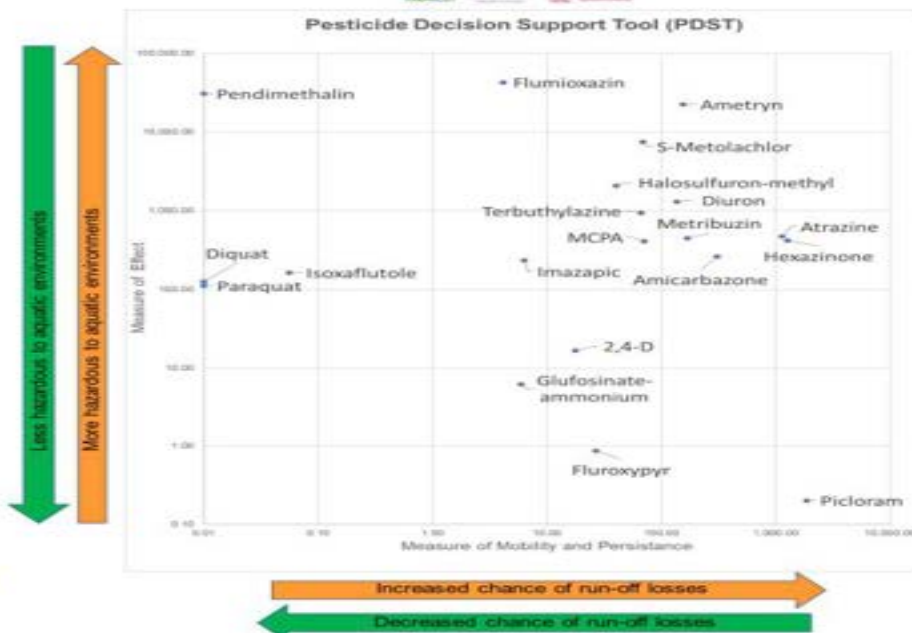
- Soil Types – Organic carbon, CEC and % Sand
- Slopes – 0-3%
 - 0.0-0.3%
 - 3.0-4.0%
 - 4.0-5.0%
 - >5%
- Bobcat Imaxx 5% and Bobcat Combi 3% max slope



- Weed Pressures
 - Grass
 - Broadleaf
- Canegrub
- Specific weed issues
 - Vines
 - Guinea Grass
 - Wild sorghum

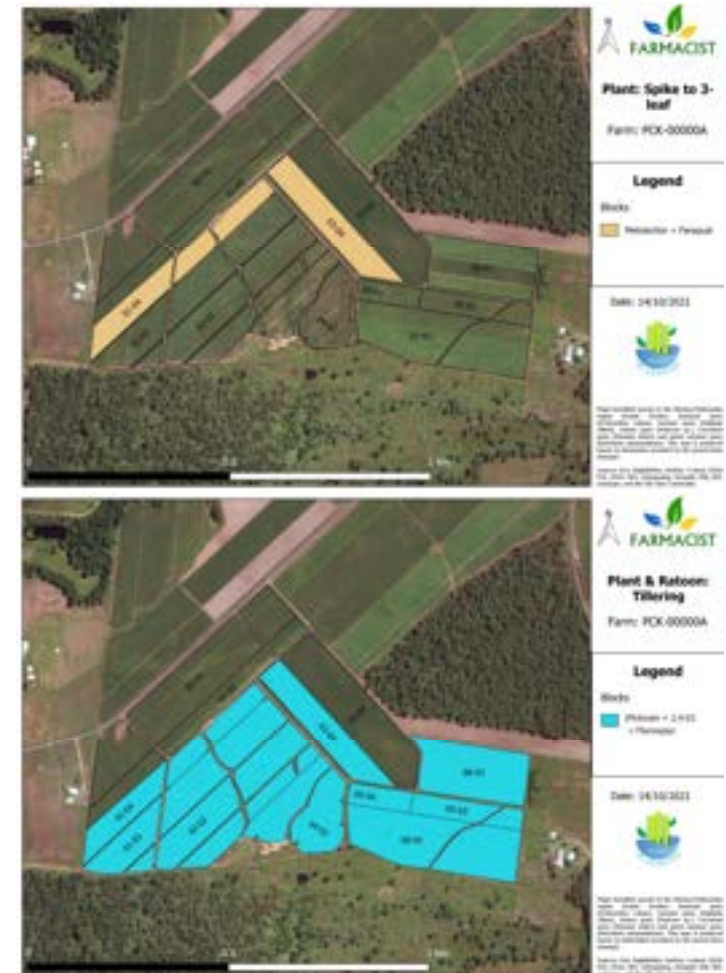


| Active Ingredient & Example Trade Name | NEW Mode of Action | Product Rate Range | Dropset size & Water Rate | Key Restrictions | Incorporation | App. Mts. Risk Rating |
|--|--------------------|-----------------------------|--|--|--|-----------------------|
| Nonionic Wettable Concentrates | | | | | | |
| 400 g/L Fluorfenoxim (eg. Stomp® 800) | 3 | 2.2 - 3.2 L/ha | Flat fan nozzles, water rate 300-350 L/ha | Do not apply mixtures with abscisic acid heavy clay soils. | Incorporate with 1.5 diamts of rain or irrigation within 5 days or activate by rain. | 0.80 |
| 750 g/L hexazinone (eg. Balanor® , Polaron® , AKO paraquat) | 27 | 100 - 200 g/L/ha | Medium to coarse droplet, Minimum 250 L/ha water rate | Do not apply to soils with CEC >3, Clay >35% or EC >0.8%. Check label for weeds control. Sugarbeet 10-12 weeks. | UV stable, rainfall or irrigation is required to activate. | 0.08 @ 100g/L/ha |
| 240 g/L mecoprop (eg. Flamer® , Imagor® , AKO paraquat) | 3 | 300 - 400 mL/ha | Water rate 300 - 200 L/ha, Medium droplet | Do not spray within 50 m of waterbodies or waterways. Imagor® , 50m down-drift buffer for waterways. | UV stable, rainfall or irrigation is required to activate. | 14.91 @ 400g/L/ha |
| 75 g/L (hexafluoro) + 750 g/L hexachlorophosphate (eg. Triox) | 15, 27 | 1 - 2 L/ha | Coarse droplet, Minimum 250 L/ha water rate | Do not apply to soils with CEC >3, Clay >35% or EC >0.8%. Substrate label 40% (acidic soil) - rainfall label | Rainfall or irrigation is required to activate. | 621.96 @ 1.5kg/L/ha |
| 750 g/L metribuzin (eg. Monter® , AKO paraquat) | 5 | 0.8 - 2 kg/ha | Minimum water rate 250 L/ha. Incorporate within 5 days. | Application should not be made if heavy rains are expected within 48 hours. Do not apply within 30m buffer to waterways and 20m to vegetation. 500 Buffers for logs. | Apply to moist soil. Incorporation by rain or irrigation required within 5 days. | 750.34 @ 1.5kg/L/ha |
| 750 g/L dicamba/trifluralin (eg. Ambrion® , Triox) | 9 | 0.5 - 1 kg/ha | Spray droplets. Should be minimum or larger. Water rate minimum 200 L/ha | Groundwater risk spray buffer for sensitive vegetation is 10m and for waterbodies and streams is 30m. Manufacturer/DO NOT apply on slopes > 2% & DO NOT apply during Oct-Dec. Do not apply > 600 g/L/ha to very sandy soils (<50%). | UV stable, rainfall or irrigation is required to activate. | 801.72 @ 750g/L/ha |
| 500 g/L flumioxazin (eg. Water® , 500 mL , AKO paraquat) | 24 | 500 - 600 g/L/ha | Coarse droplets for Water. Coarse droplet requirement for paraquat products. Water rate > 200 L/ha | 1.25m down-drift buffer to protected vegetation. 5m down-drift buffer to streams & water bodies. Do not apply to sandy soils where slope exceeds 4%. | UV stable for at least 3 weeks. Reapply. Onset within 3 weeks. | 1769.26 @ 500g/L/ha |
| 600 g/L Dicloron (eg. Dicloron 300) | 9 | 0.275 - 1.9 kg/ha | DO NOT apply with spray droplets smaller than CS-0450 (spray droplet size category) | Apply only in a directed band spray over a maximum 50% of the crop area. Do not apply if greater than 100mm rainfall expected within 3 days. Do not apply where slope exceeds 2%. DO NOT use on slopes. Apply, refer to label. Down-drift buffer to aquatic areas 100m, terrestrial vegetation 20m. | Rain or irrigation is required within 10 days. | 1775.47 @ 300g/L/ha |
| 350 g/L mecoprop + 750 g/L hexazinone (eg. Stomp® , AKO paraquat) | 2, 5 | 500 - 650 g/L/ha | Reduce the incidence of "flood" for using the correct nozzle and operating pressures. | Maximum slope 5%. | Rainfall or irrigation is required to wet soil for 50m prior to weed emergence. | 4790.40 @ 500g/L/ha |
| 900 g/L dicamba (eg. Outlast®) | 15 | 1.45 - 1.8 L/ha | Minimum 60 L/ha of water. | Do not apply if runoff events are forecast within 2 days of application. | Rain or irrigation is required for the wet soil to run. Excess will reduce efficiency. | 5174.14 @ 1.8L/ha |
| 800 g/L tri-allate (eg. Ambrion® , 900000) | 5 | 2.2 - 3.0 kg/ha | Minimum water volumes 230 L/ha. | DO NOT mix, load or apply within 20m of any well or stream. DO NOT apply this product within 50m of natural or unimproved lakes or dams. DO NOT use to characterize or drains. Do not apply if runoff causing rain is forecast within 2 days of application. | Apply to moist soil, requires incorporation within 10 days. | 5361.76 @ 2kg/ha |
| 270 g/L hexazinone (eg. Triox) | 3 | 1.5 - 2 L/ha + Mts. partner | CS-0450 or larger spray droplet 100-200 L/ha water rate. | Do not use in plantations until after final felling. Avoid contact with growing forest. Do not apply where slope > 5% (do not use on light sandy soils - crop injury risk) | Some UV stability but requires rainfall for activation. | 5761 @ 2 L/ha |
| 400 g/L dicloron + 150 g/L hexazinone (eg. Balanor® , Combi 900 , Stomp) | 5 | 1 - 4 kg/ha | CS-0450 or larger spray droplet 400-600 L/ha water rate. | Do not apply if greater than 100mm rainfall expected within 3 days. Do not apply where slope exceeds 5%. DO NOT use on slopes. Apply, refer to label. Buffer to natural waterways 500m, vegetation 200m. Do Not Exceed 50% coverage of products. | Best results if incorporated within 3 to 5 days after application. | 6276.69 @ 1.5kg/L/ha |
| 600 g/L dicamba (eg. Ambrion® , 900000) | 5 | 2.8 kg/ha | Minimum water rate 120 L/ha | Scouting should not be performed for 16 days following application without PPS. | Apply to moist soil, require incorporation within 10 days. | 34,610.85 |
| Nonionic Emulsifiable Concentrates | | | | | | |
| 150 g/L Fluorfenoxim (eg. Stomp® , Advantage) | 4 | 760 mL/ha | Water rate 300 to 400 L/ha. Flat fan nozzle applying a medium quality spray. | Do not apply if rain is likely within 1 hour. Adjust - 1.5kg/ha @ 1600 mL/100L. | | 0.23 |
| 700 g/L 2,4-D (eg. Ambrion® , Advantage 700) | 4 | 0.5 - 1.1 L/ha | Mandatory use of Very Coarse spray droplets or larger. Water rate 500 - 250 L/ha | NEO SPINAT buffer zones apply for biosecurity applications where application allows canopy height. Refer label. DO NOT apply under unimproved conditions. | | 2.96 @ 1.1L/ha |
| 240 g/L Picloram (eg. Picoflex®) | 4 | 120 - 470 mL/ha | Aerial water 100L/ha Ground 200 L/ha minimum. | Use Mts partner, refer label. Adjusted 1.5kg/100L or Water 1000L 100mL/100L. | | 3.77 @ 470mL/ha |
| 300 g/L 2,4-D + 75 g/L Picloram (eg. Trooper® , PS-0) | 4 | 0.7 - 1.3 L/ha | Mandatory use Very Coarse droplet. Water rate 300-1000 L/ha | NEO SPINAT buffer zones apply for biosecurity applications. Do not apply under weather conditions or from equipment that may cause drift onto nearby susceptible plants or crops or pastures. | | 4.26 @ 1.3L/ha |
| 750 g/L MCPA (eg. Agrotop® , 750) | 4 | 0.90 - 1.45 L/ha | Coarse droplet. Water rate 300 - 1200 L/ha | Directed spray (band spray) only. Do not apply if rain is likely within 6 hours. Avoid off-target spray drift. | | 280.51 @ 1.5L/ha |
| Nonionic Soluble Concentrates | | | | | | |
| 250 g/L dicamba (eg. Ambrion® , 250 SL) | 22 | 0.2 - 1.6 L/ha | Minimum 200 L/ha water, droplets 200-250 micron. | Avoid off-target spray drift. Do not use additive or emulsifier wetting agents. Use clean water only. | Stronger on grasses than Spiny Speed. | 0.60 |
| 150 g/L picloram + 150 g/L dicamba (eg. Spiny Speed® , 250) | 22 | 0.2 - 2 L/ha | Water rate 250 - 400 L/ha. 1.5m flat fan nozzle, pressure 200 to 300kPa. | Avoid off-target spray drift. Use clean water only. | Stronger on broadleaf weeds than Picloram. | 0.60 |
| 300 g/L glyphosate-ammonium (eg. Roundup®) | 10 | 1 - 1.5 L/ha | 300 to 500 L/ha water/ha. Coarse to very coarse droplets. | Do not apply where slope exceeds 4%. Do not apply if rain is expected within 48 hrs. 50MP 26 weeks. | Use of AAE recommended. | 6.57 @ 1.5L/ha |
| Regulants | | | | | | |
| 750 g/L haloxyfury-methyl (eg. haloxyfury-methyl) | 3 | 65 - 130 g/L/ha | Minimum 800 L water/ha. | Do not apply if heavy rainfall forecast within 48 hours. Do not apply if rain is likely within 12 hours. | Adjustment - Supercharge or Tempo @ 1000 mL/100L | 834.21 @ 1.3L/ha |



Actives Plan

Pesticide Selections by growth stage



Equipment calibration and upgrades

- How often do growers accurately calibrate their spray equipment
- Key findings during boom assessments
- Looks can be deceiving
- Managing drift through nozzle selection
- Nozzle spacing V's Coverage







Looks can be deceiving



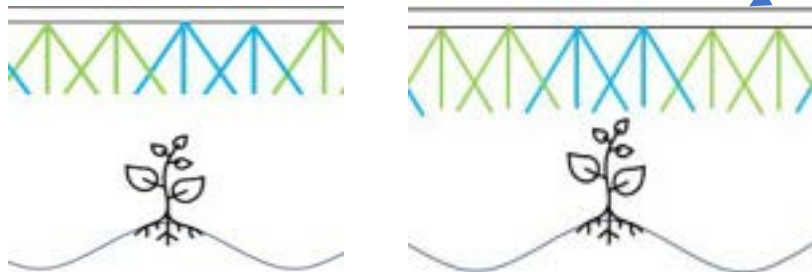
Nozzle Spacing – 1.55m rows X 7 rows = ???
12-meter boom = How many rows???



Nozzle Placement & Spacing

| Row Spacing | Boom Width | | | | | |
|-------------|------------|------|------|------|------|------|
| | 8 | 8.5 | 9 | 9.5 | 10 | 12 |
| 1.55 | 5.16 | 5.48 | 5.81 | 6.13 | 6.45 | 7.74 |
| 1.6 | 5.00 | 5.31 | 5.63 | 5.94 | 6.25 | 7.50 |
| 1.625 | 4.92 | 5.23 | 5.54 | 5.85 | 6.15 | 7.38 |
| 1.65 | 4.85 | 5.15 | 5.45 | 5.76 | 6.06 | 7.27 |
| 1.7 | 4.71 | 5.00 | 5.29 | 5.59 | 5.88 | 7.06 |
| 1.75 | 4.57 | 4.86 | 5.14 | 5.43 | 5.71 | 6.86 |
| 1.8 | 4.44 | 4.72 | 5.00 | 5.28 | 5.56 | 6.49 |
| 1.85 | 4.32 | 4.59 | 4.86 | 5.14 | 5.41 | 6.49 |
| 2 | 4.00 | 4.25 | 4.50 | 4.75 | 5.00 | 6.00 |

Nozzle Spacing



| Cane Row Spacing | Ideal nozzle spacing (m) | Ideal nozzle spacing (cm) | Most common spacing (m) | Most common spacing (cm) |
|------------------|--------------------------|---------------------------|-------------------------|--------------------------|
| 1.5 | 0.5 | 50 | 0.5 | 50 |
| 1.55 | 0.3875 | 38.75 | | |
| 1.6 | 0.4 | 40 | | |
| 1.625 | 0.406 | 40.62 | | |
| 1.65 | 0.41 | 41.25 | | |
| 1.7 | 0.425 | 42.5 | | |
| 1.75 | 0.4375 | 43.75 | | |
| 1.8 | 0.45 | 45 | | |
| 1.85 | 0.4625 | 46.25 | | |
| 2 | 0.5 | 50 | | |





Pesticide Application – Boom Setup

Potential Volume Loss <150um @ 3bar



XR

41%



AIXR

16%



AITTJ60

8%



AI Teejet

4%



TTI60

1%



End of paddock runoff sampling

- Engage local growers
- Compare losses from different actives
- Demonstrate impact of changed practice
 - Amount on → Amount off
 - Timing → post harvest v late directed
 - Runoff from differing soils, slopes, rainfall events
- Managing high risk Pesticides
 - Eg early application of metolachlor



PB22-05 Site Details

- Variety: Plant SRA9
- Soil type: Clay Loam
- Location: Koumala
- Irrigation: Overhead
- Row Spacing: 1.85m
- Row length: 560m
- Slope: 0.9%
- KP event samplers
- 4 sec in 10min -> 2.5L

Herbicide History:

- Bed form
 - glyphosate + fluroxypyr (1800+160gai/ha)
- Multispecies break crop
 - 1 x haloxyfop (78gai/ha)
 - 1 x glyphosate + fluroxypyr (1620+120gai/ha)
- Plant
 - metolachlor + paraquat+atrazine (1728+250+2430gai/ha)
 - msma 2880gai/ha
 - Pendimethalin+ paraquat+ isoxaflutole, (1452+250+80gai/ha)
 - 2,4-D + fluroxypyr (700+160gai/ha)



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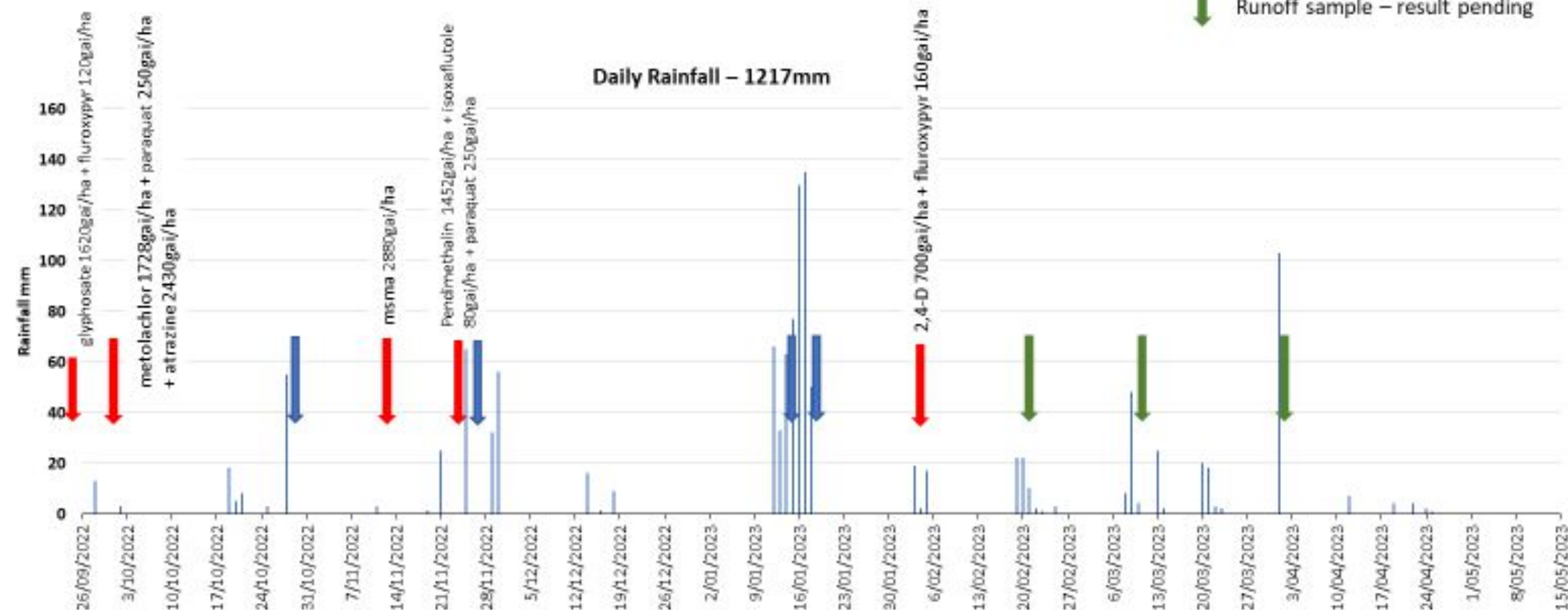
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PB22-05

- ↓ Herbicide application
- ↓ Runoff sample – result received
- ↓ Runoff sample – result pending



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Mean Runoff to Date ug/L

| PB22-05 | 28/10/2022 | 25/11/2022 | 13/01/2023 | 17/01/2023 |
|---------------|------------|------------|------------|------------|
| 2,4-D | 0.775 | 0.09 | 0.12 | 0 |
| Atrazine | 13.6 | 0.635 | 0.225 | 0.06 |
| Fluroxypyr | 3.2 | <0.7 | 0.72 | 0 |
| Isoxaflutole | 1.25 | 6.55 | 0.44 | 0.34 |
| Metolachlor | 34 | 4.15 | 0.77 | 0.1 |
| Pendimethalin | 0 | 28 | 0.47 | 0.06 |



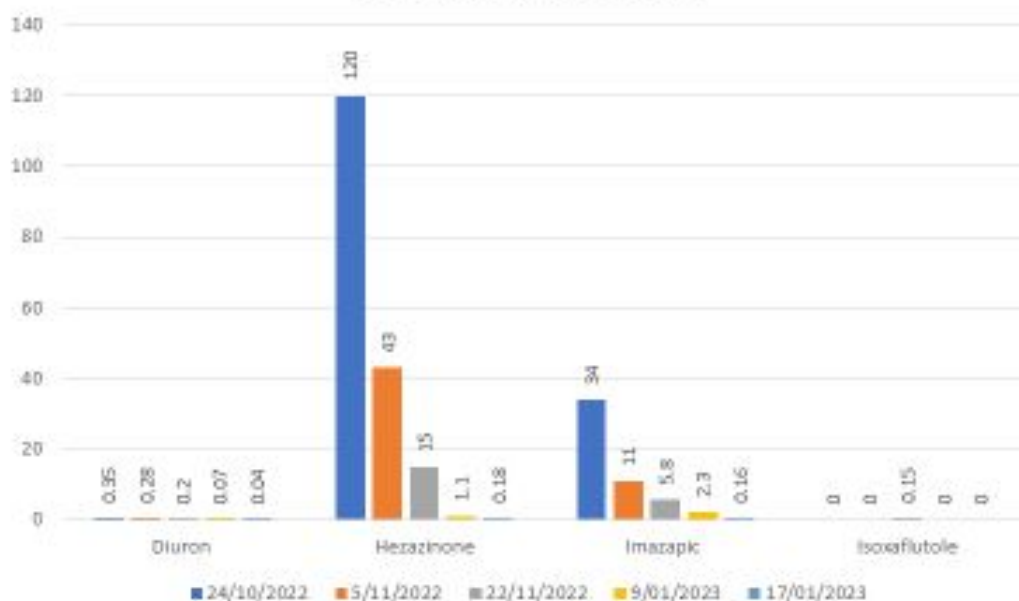
Post harvest and out of hand pre-emergent

- Variety SRA9 & Q183
- Soil type: Sandy Loam
- Location: Balbera
- Irrigation Method: Winch & Flood
- Row Spacing: 1.65m
- Previous Herbicide Applications:
 - Balance
 - Atrazine
 - Bobcat Combi

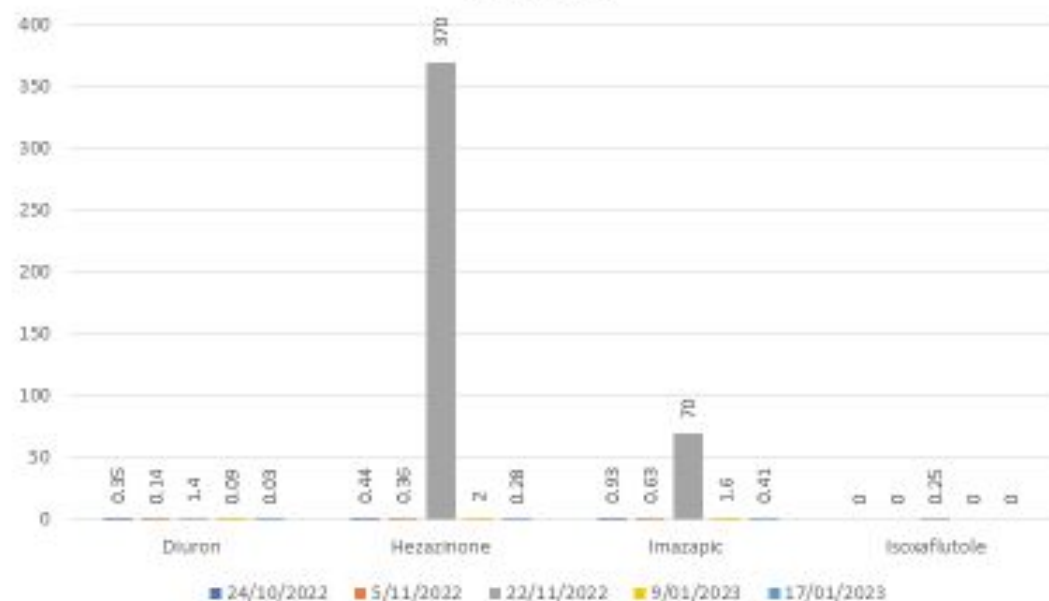


Bobcat iMaxx Post Harvest vs OOH

Bobcat iMaxx Post Harvest



Treatment 7



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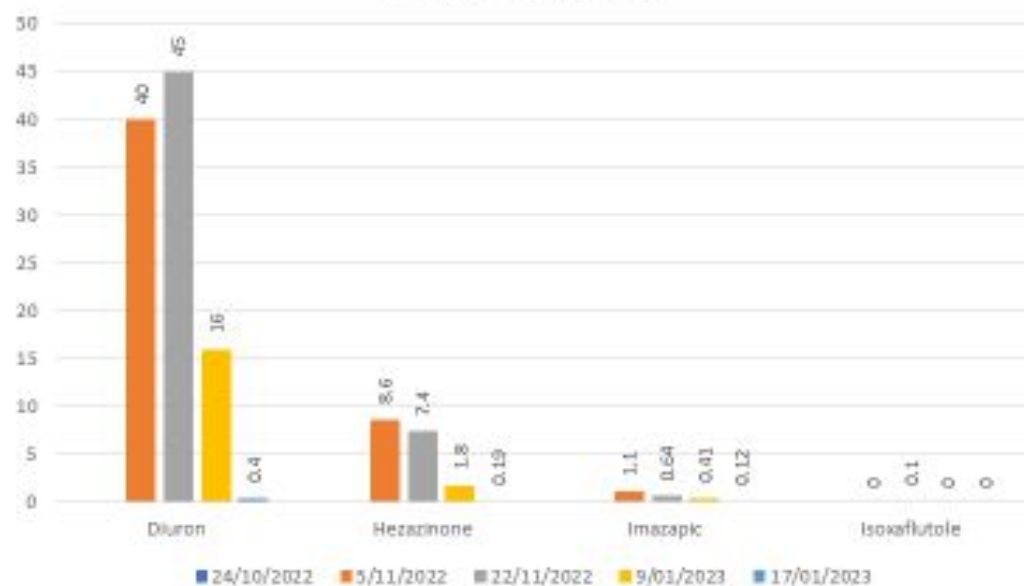
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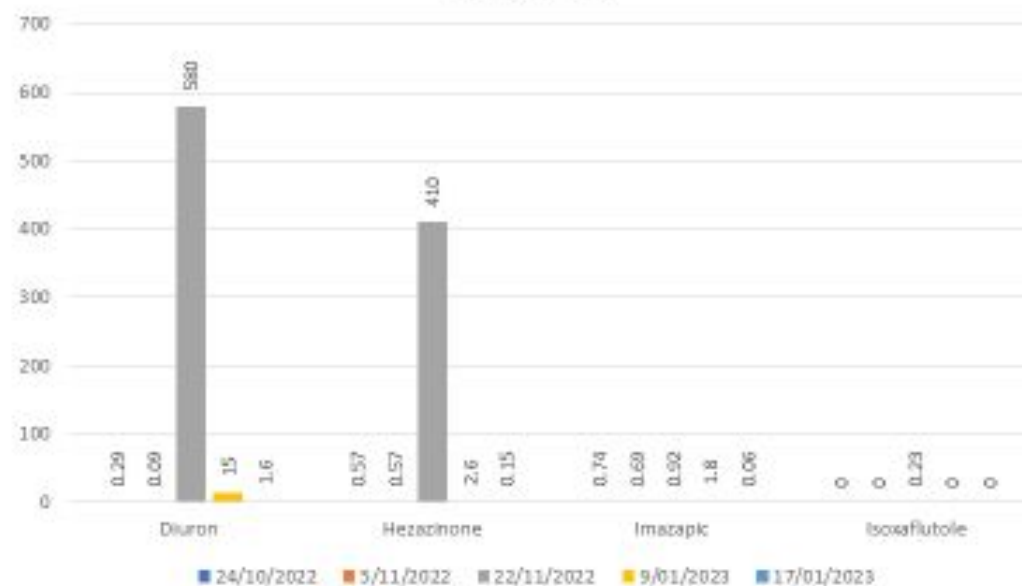
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Barrage Post Harvest vs OOH

Barrage Post Harvest



Barrage OOH



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