

Formulation and Runoff

Case Study

Granular vs Liquids

- Variable
- Liquid often is higher if high solubility
- Granular may be higher if carried off site
- More a function of the chemical and adjuvant

In this case...

- ...the effect of formulation was marked. The fraction of applied granular diazinon recovered in runoff water was $1.5 \pm 0.2\%$ of application, while $21.8 \pm 4.3\%$ of applied aqueous concentrate diazinon was recovered in runoff
- Granular dissolution rate-limiting mechanism appears to reduce post-application off-site granular diazinon movement in runoff water relative to aqueous concentrate applications in turf.

Figure 7c. Mean runoff curves (mean conc. +/- sd vs. volume) **AND** cumulative mass vs. volume curves for aqueous concentrate, low slope, low water rate treatment group (plots 5, 16, 22, 32) and aqueous concentrate, low slope, high water rate groups (plots 8,14,24,29)

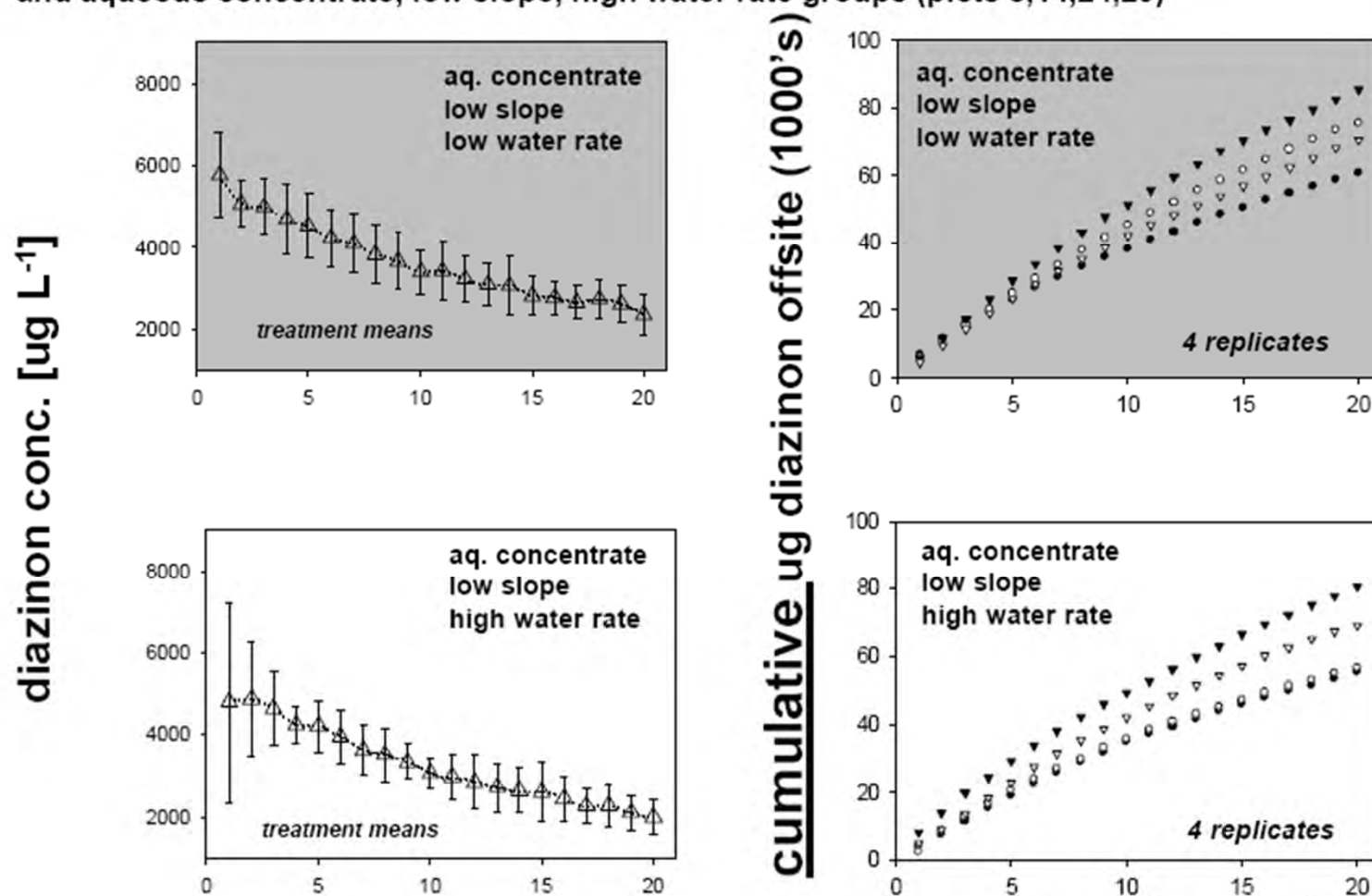
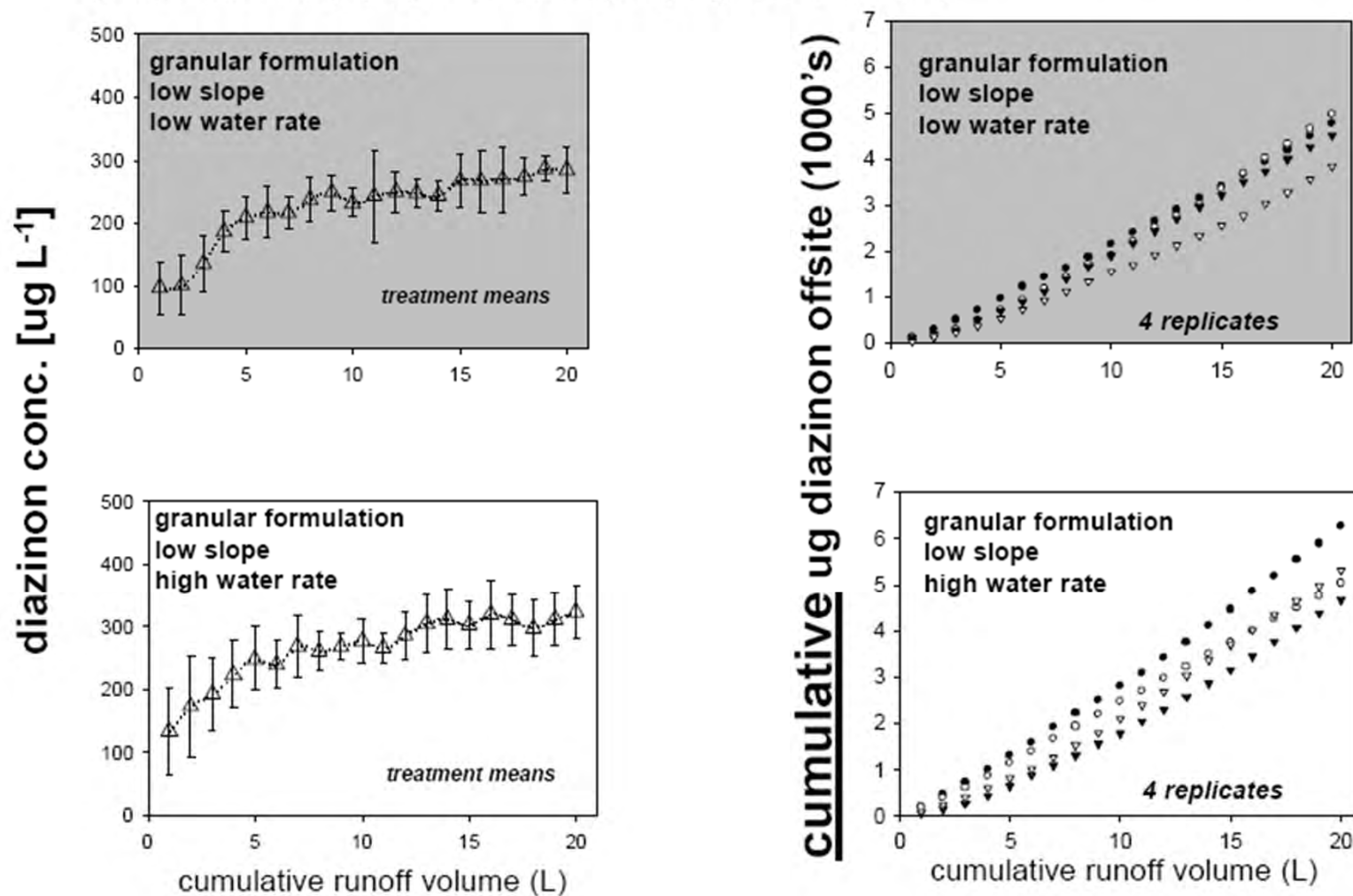
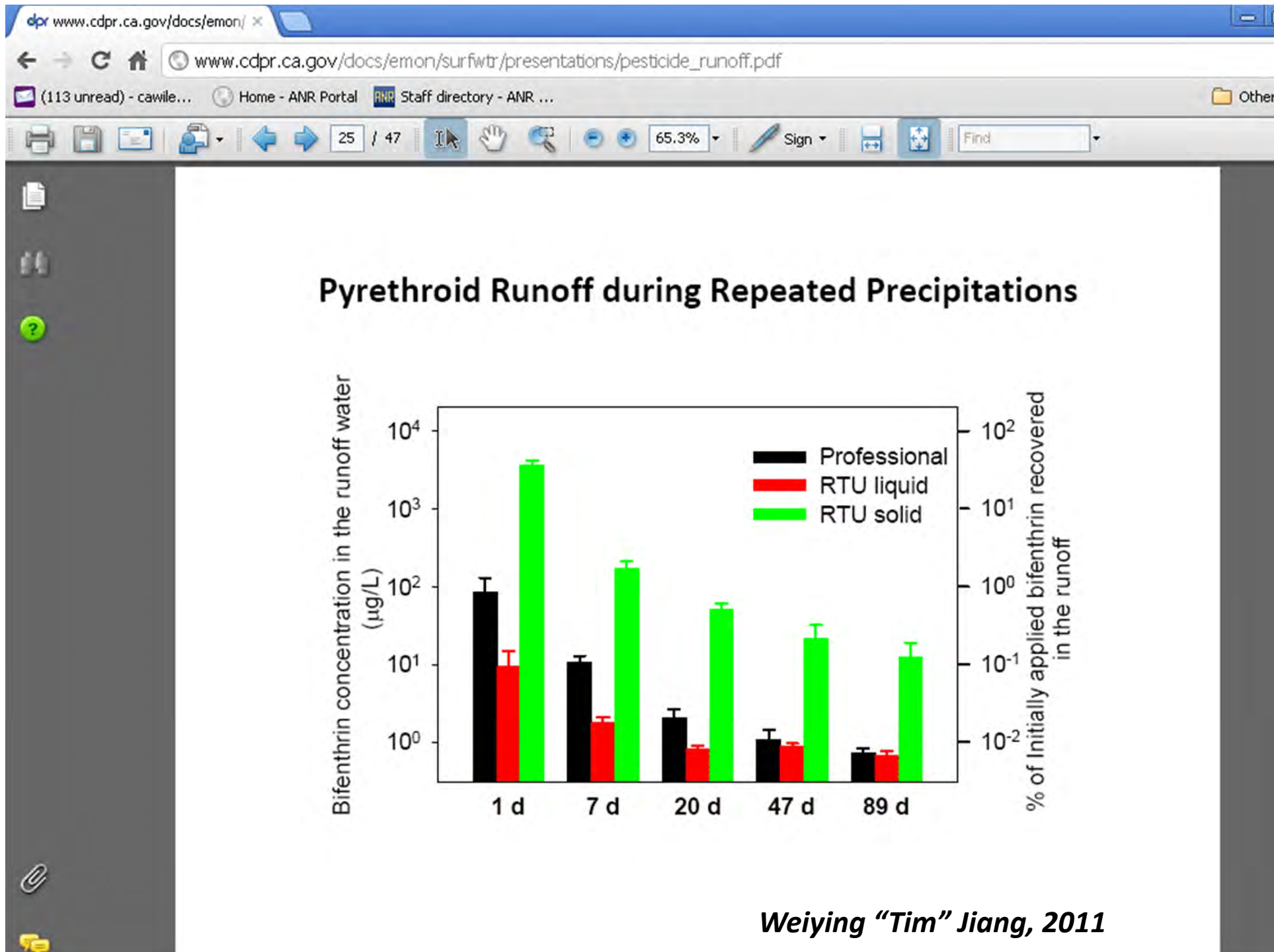


Figure 7a. Mean runoff curves (mean conc. +/- sd vs. volume) AND cumulative mass vs. volume curves for granular, low slope, low water rate treatment group (plots 7, 13, 23, 30) and granular, low slope, high water rate groups (plots 6,15,21,31)





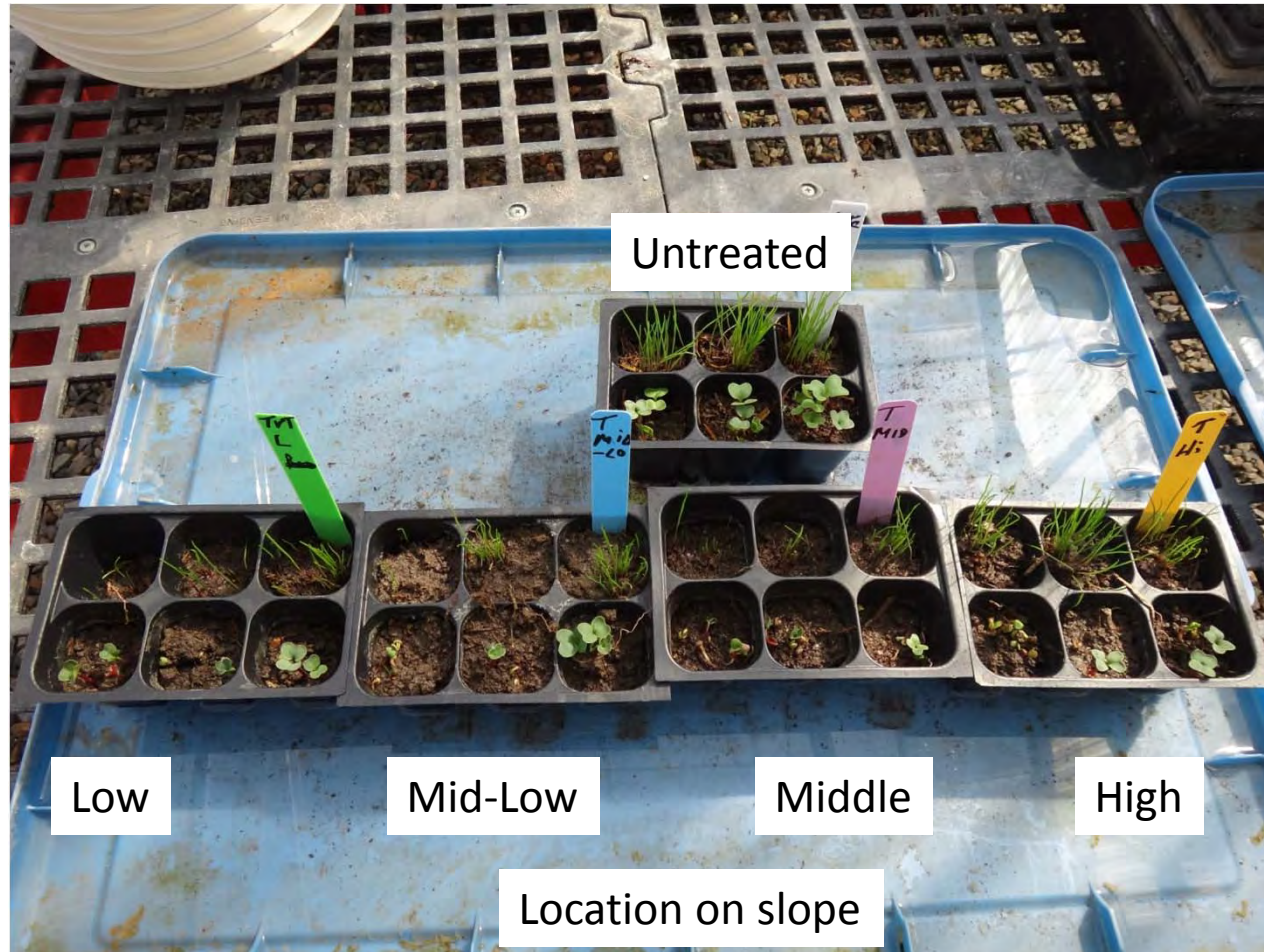
Injury noted about 4WAT



Distinct line of injury

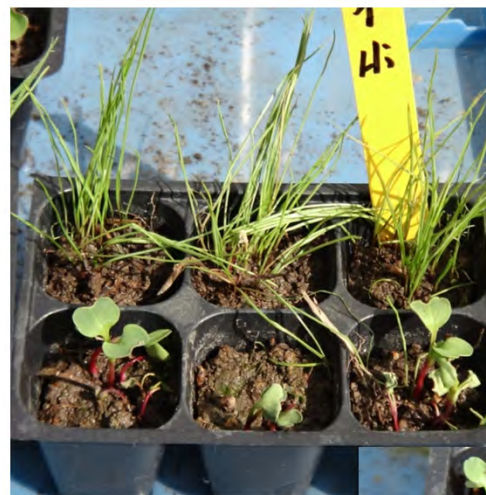


Bioassay 1week ryegrass and radish





Untreated



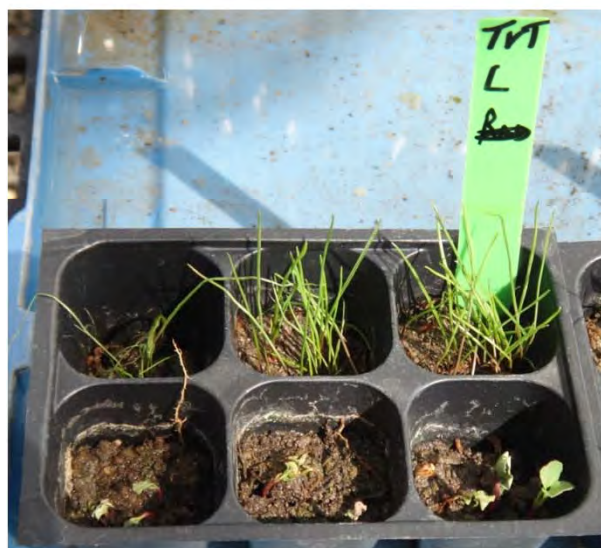
High



Middle



Mid-Low



Low

~2 Weeks

Likely Surface Movement Carried on soil particles



Landmark XP

Sulfometuron methyl+Chlorsulfuron
like Oust+Telar

DuPont™ Landmark® XP herbicide delivers long-lasting control of over 120 broadleaf weeds and grasses. Sulfonylurea

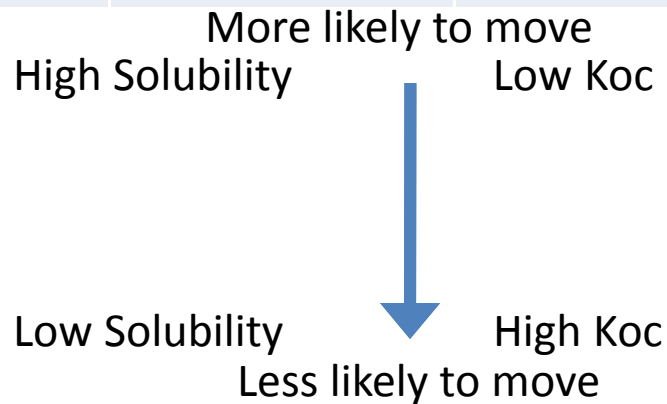
The herbicide may be taken up by plants through both roots and foliage. Herbicide symptoms in target plants appear within 2 to 3 weeks after application.



Properties

Common Name	Pesticide Movement Rating	Soil Half-life (days)	Water Solubility (mg/l)	Sorption Coefficient (soil Koc)
Sulfometuron-methyl	Moderate	20	70	78
Chlorsulfuron	High	40	7000	40
Oryzalin	Low	20	2.5	600
Oxadiazon	Very Low	60	0.7	3200

Not well adsorbed



Adjuvants

- **Grounded** - use with residual herbicides to reduce drift, leaching and improve weed control.
- Specifically designed to improve the performance of residual materials it combines non-ionic surfactants, sticking agents and emulsifiers with a special oil that **increases the adsorption of the herbicide onto soil particles** and therefore significantly reduces leaching.
- Mineral Oil (85%) Polyol fatty acid ester (15%)

What Went Wrong?

- Right herbicide but wrong place
 - High Solubility/Low Koc
- Right idea about adjuvant but wrong soil type
 - Use of adjuvant (Grounded) that probably increased Koc
- Hillside
- Soil movement
- About 1" rain not long after application