

Platte River Water Quality Testing for Imazapyr chemical



Background

During the summer of 2008 and 2009 Platte Valley and West Central Weed Management Areas applied trade name Habitat^R herbicide on approximately 12,000 acres of Phragmites and Purple Loosestrife within the Platte River corridor. Habitat^R is EPA labeled for aquatic use to control undesirable wetland, riparian and terrestrial vegetation growing in and around surface water. The product is not harmful to aquatic or terrestrial fauna at recommended rates. EPA uses LD50 to estimate the potential toxicities of a product. LD50 of a product is the acute dose required to cause mortality in one half of a test population. The LD50 of Imazapyr for humans is greater than 5,000 parts per million (ppm), for a duck the LD50 is greater than 2,150, for a rainbow trout greater than 100, aquatic invertebrates (*Daphnia magna*) greater than 100 ppm. Habitat^R has a 120 day irrigation restriction if applied within a waterway or system that is used for irrigation purposes. Habitat^R is recommended at one to three quarts per acre depending on vegetation species present. State licensed applicators applied two quarts per acre after irrigation season or below any irrigation diversions with majority of application done by helicopter. A pilot water quality testing program was initiated in 2009 to document any presence of Imazapyr (active ingredient in Habitat herbicide) within the channels of the Platte River.

Sample Locations and Results

Eleven samples were taken at five different locations within the Platte River in Central Nebraska.

Samples PV01, PV02 and PV03 were taken at highway #34 bridge south of Grand Island. Contractors were actively applying herbicide upstream. Samples were spaced across the channel from south to north and sample number one was in a slow moving backwater area surrounded by Phragmites that was applied with herbicide minutes before sample was taken.

Samples PV04 and PV05 were taken west of the Kearney bridge. Samples were taken after four hours of application upstream and during active application at sample locations. Sample locations were spaced south to north across moving channel.

Samples PV06 and PV07 were taken east of the Minden highway bridge. Contractors were actively spraying herbicide during sample collection. Sample number PV06 was slow moving backwater.

Samples PV08 and PV09 were taken approximately three miles west of Central City. Contractors applied herbicide during morning hours and for the previous two days upstream. If any bio-accumulation occurs these samples should capture chemical levels.

Samples PV10 and PV11 were controls taken upstream of Overton bridge where no aerial application had taken place. Spot treatments along bank lines were performed in the last two weeks.

Table 1. Results of Imazapyr chemical at sample locations shown in parts per billion.

sample ID	sample Description	Imazapyr residue [µg/ml]or ppb*
Plate River_100209-15	PV01	51
Plate River_100209-16	PV02	11
Plate River_100209-06	PV03	6
Plate River_100209-07	PV04	7
Plate River_100209-08	PV05	8
Plate River_100209-20	PV06	53
Plate River_100209-21	PV07	17
Plate River_100209-11	PV08	1
Plate River_100209-12	PV09	1
Plate River_100209-13	PV10	<1
Plate River_100209-14	PV11	1
Rcoveries=103% (n=2) Control Reference water <1 ppb *Part per billion		

Summary

Imazapyr chemical was found in trace amounts at all sample locations. The highest amounts (53 ppb) were found in a slow moving backwater slough area that was surrounded by Phragmites and received direct application. The 53 ppb, or 0.053ppm, is extremely below the LD50 of invertebrates’ dosage which is greater than 100 ppm, or 100,000 ppb. Imazapyr chemical is rapidly diluted and broke down in the water column and does not build residue levels over extended area or time.