Crop protection compounds in drainage water, ditches and yard run off monitored with passive sampling

Deltares

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1220987-000

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Client	Project	Reference	Pages
Bayer Cropscience SA-NV	1220987-000	1220987-000-BGS-0006	71

Keywords
Passive sampling, Drainage water, Yard run-off, Water quality monitoring, Plant protection products, Forward farming

Abstract
The Forward Farm in Abbenes is an independent farm that has a partnership with Bayer Crop Sciences in order to gain insight in emission pathways of plant protection products to surface waters and where measures are tested to reduce the emissions.
To get insight in emissions via drains, the quality of drainage and ditch water has been monitored during a year using passive sampling. Also water from a special yard run-off system was investigated to test the efficiency of this measure.
A new deployment system for the passive samplers was developed and applied during three periods: before, during and after the application of the plant protection products.
Silicone rubber and Speedisk samplers were installed at the end of two drains located in a field with potatoes and at two drains in a field with winter wheat. A test was done on the winter wheat with the application of a double dose of the product Herold SC with diflufenican/flufenacet as active compounds. The samplers were analysed on a broad range of active compounds, including most compounds that were applied on the various crops (potatoes, sugar beets, flowers and winter wheat) during the year.
To investigate the yard run off system, samplers were installed at the discharge of the system.

Application of passive sampling in drains
The results of the monitoring showed that the developed device was working well and was easy to apply. This made it possible to monitor the drainage water over a longer period, even when the drain temporary went dry during the monitoring period. More compounds were detected on the samplers than in the grab samples.

Compounds in drains and ditches
Many compounds that were applied on the fields were detected in the drains. The concentrations varied and also the moment that the compounds were released. Some compounds were released with the first flush of water and others after a longer retention time. This makes it beneficial to use passive sampling for the monitoring because the sampling occurs over a longer period, the chances of missing a peak concentration are much smaller than while using regular water sampling (which is like a snap shot).

A double dose of a crop protection product with diflufenican/flufenacet resulted in a higher concentration flufenacet. Diflufenican did not show higher concentrations, probably because the compound is more hydrophobic compared to flufenacet and will bind stronger to soil organic matter.

Organic matter binds plant protection compounds and plays therefore a role in the retention. It is assumed that a higher organic matter content gives more binding of compounds. However part of the potato field contains higher organic matter contents, but the concentrations in the drain located in this part were generally higher than in the drain located at the part of the field

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with lower organic matter content. The higher concentrations might be caused by preferential flow paths in the soil which result in faster leaching of compounds to the drains.

Many compounds were emitted in the autumn/winter season, after the application period. Emission via drains is therefore a source of crop protection compounds in periods when they are not applied and do not enter the water via drift. During the periods that the samplers were installed in the ditch, no run off event occurred so the concentrations detected in ditches were mainly coming from the drainage system.

Yard run off system
At the Forward Farm a special system had been developed in which rain water that runs off the yard is first drained though a vessel with compost before it enters the ditch. The purpose of this system is to bind possible active compounds in this run off water and prevent emission to the ditch.
Many compounds monitored in the water flowing from this system occurred in relatively constant concentrations, some of them above 1 µg/L. Probably these compounds were adsorbed in the past and released now, maybe due to biodegradation of the compost. Three compounds, chloorprofam, dimethenamid (-P) and metolachloor, were present in high concentrations during the monitoring periods in spring, summer and autumn/winter. These concentrations may be caused by two incidents in 2015 and the beginning of 2016 with the emission of high concentrations of these compounds. They were initially bound in the system, but are released during the year. These incidents show that even with a system to prevent compounds from entering the ditch, yard-run off is a serious source of active compounds in the surface water.

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Content

1 Introduction

Crop protection products are widely used in agriculture. Due to the emission of active compounds by drift, (yard) run off and leaching, they enter the surface water and can cause potential environmental risk in case of noncompliance of the water quality standards.

To improve the water quality, the Dutch parliament agreed on the Directive for sustainable crop protection – healthy growth, sustainable harvest (Gezonde Groei, Duurzame Oogst; Tweede Nota Duurzame Gewasbescherming). This Directive aims a reduction of exceedance of the water quality standards of plant protection substances of 50% in 2018 and 90% in 2023 (compared to the reference period 2011-2013) based on monitoring results.

Various measures can be taken to reduce the emission of plant protection substances to surface waters. However, to identify which measures are most effective, it is crucial to get a better overview of the underlying emission patterns. Such insight can be gained by modelling and monitoring actions with real-life scenarios. On the Forward Farm of Bayer Crop Science in Abbenes, the concentrations of plant protection substances are monitored in drainage waters and the ditches. Additionally, the water quality from the yard run off system was monitored. This system is a measure to reduce the emission of the active compounds by yard run off.

The monitoring was performed by using passive sampling, a new technique of sampling the water by applying samplers with a high affinity for plant protection substances in the water for a period of several weeks. Compared to regular water sampling, the water quality can be monitored over a longer period.

1.1 Aim

The main aim of the project was

- Get more insight in the emissions of the active compounds applied on the field during the crop season via leaching towards subsurface drains and in the influence on the water quality of the ditches in which the drain water enters.

The secondary aims were to:

- Develop a system to monitor the water of the drains by passive sampling
- Get insight in the water quality of the water that enters the ditch from the yard run off system

1.2 Content report

This report describes the results of the monitoring. In Chapter 2 more information is given about the location and the setup of the performed monitoring is described. Chapter 3 shows the data with some discussion about the results, followed by the conclusions in Chapter 4.

2 Study site and the monitoring set up

2.1 Location

The Forward Farm of Bayer Crop Science is located in the Haarlemmermeer polder in the west of the Netherlands (Figure 2.1).

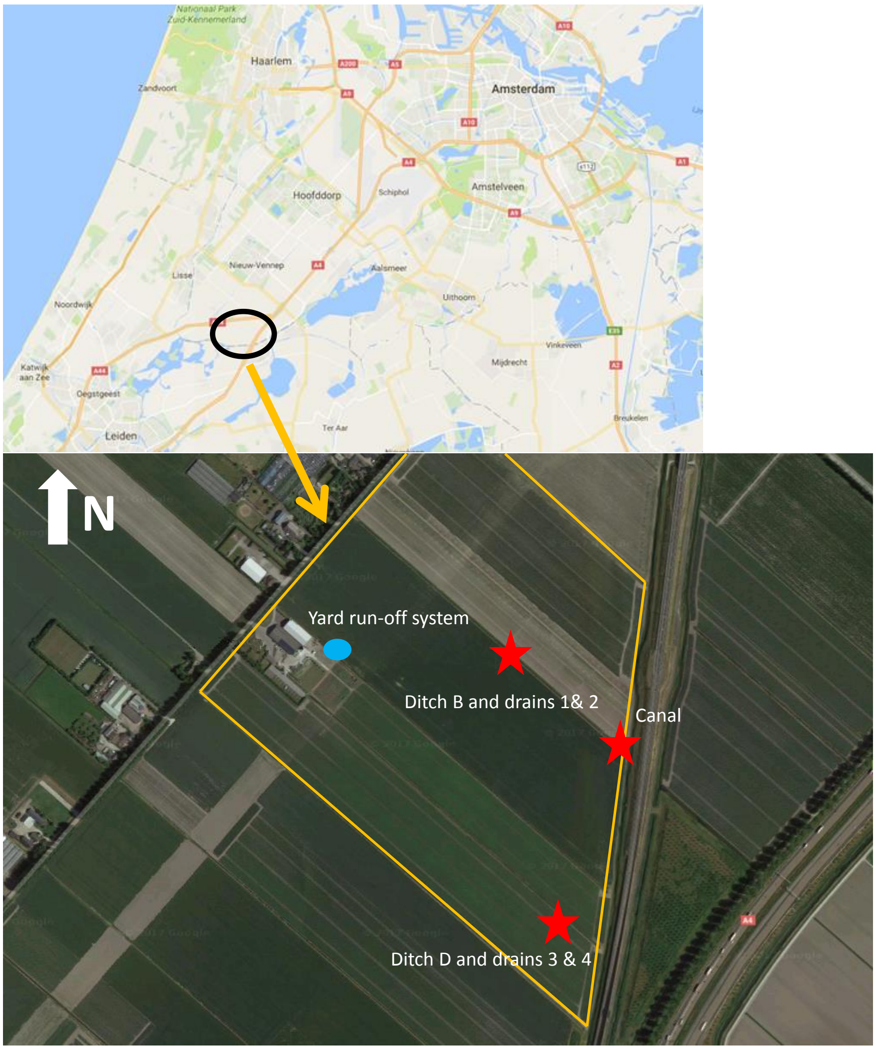

Figure 2.1 Location of the Forward Farm where the monitoring is performed in the drains and ditches (red stars) and the yard run off system (blue circle)

It is an agricultural farm with mixed crop production. In 2016, potatoes, sugar beets, asters, tulips, mixed flowers and winter wheat were grown on the various fields.

2.1.1 Geohydrology

The study site is located in the Haarlemmermeer polder and is reclaimed in the 19th century. The polder has an approx. 7 meter thick layer of Holocene clayey and peaty deposits overlying an aquifer of Pleistocene sands (Delsman, 2015). Between the Pleistocene sand and Holocene clay is a thin layer of 5 -10 cm peat deposits. The Holocene cover layer is resistive, and prevents large-scale upward groundwater flow. However, cracks in this peat layer can cause boils, localised upward seepage of brackish water from the brackish Pleistocene aquifer. This brackish water is over 8000 years old.

In 2011, the conductivity of the surface water was measured in several ditches in the part of the Haarlemmermeer polder where the study site is located, including ditches where the passive samplers were deployed for this project (black circle in Figure 2.2). The red colour indicates high conductivity and thus salty water, blue equals low conductivity and with that fresh water. The salty water intrusion is caused by seepage from the Pleistocene aquifer. Conductivity values at the Forward Farm indicate a mixture of local drainage water and Pleistocene aquifer water. In the canal along the farm, water originates predominantly from outside the Haarlemmermeer. This water is let into the area for flushing purposes.

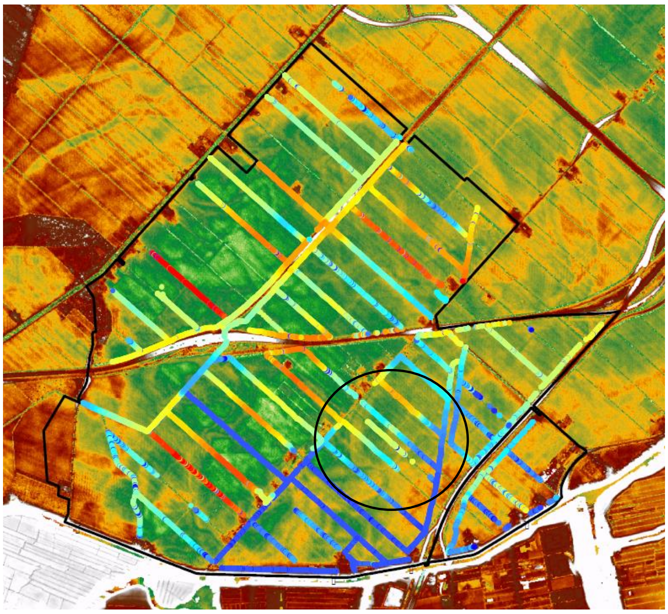

Figure 2.2 Conductivity of the surface water in the ditches in part of the Haarlemmermeerpolder. The study site where passive samplers are deployed is marked with the black circle. Blue = low and red = high conductivity (Delsman 2015)[1].

The water that flows from the drains into the ditches derives from rain and irrigation and has passed the soil. Active substances in the drain water originate from application crop protection products that are applied on the fields. Monitored compounds in the ditches could also come from the canal, as water from the canal can enter the ditches.

The top layer of the soil consists of marine clay (zwelklei in Dutch). This clay can contain cracks that open during dry periods, enabling water to reach the drains through preferential flow channels.

2.2 Monitoring set up in drains and ditches

2.2.1 Locations

Passive samplers were deployed at seven locations at the study site (Figure 2.3). Four were installed at the end of a drain, two in a ditch and one in the canal. Water from the ditches can be released into the canal, but water from the canal can also be let into the ditches in order to flush the water system.

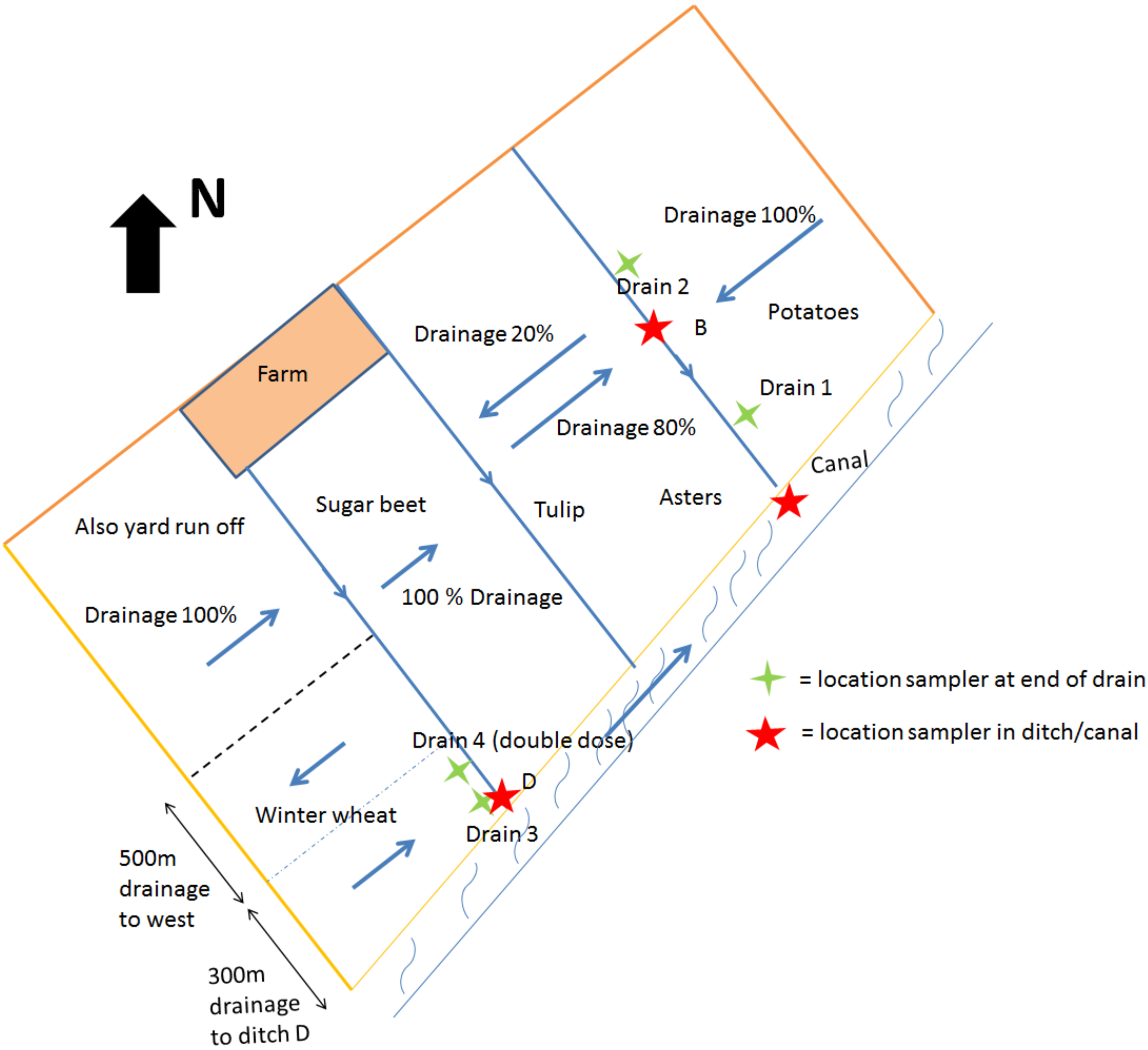

Figure 2.3 Sampling locations for monitoring water quality of drain water (green stars) and ditch water (red star).

Potatoes were grown in 2016 on the parcel lot where Drain 1 and 2 were located (Table 2.1). Ditch B was, besides the crop protection compounds sprayed on the potatoes, also influenced by compounds used on asters and tulips. At drain 3 and 4, winter wheat was produced. Near drain 4, a test was done with a double dose of the product Herold SC containing diflufenican and flufenacet as active compounds. Ditch D was also influenced by compounds used for the growth of sugar beets. In Appendix A, a list of products is given that has been applied on the fields during the deployment of the samplers.

Table 2.1 Sampling locations and crops influence

Location	Crop influence	Remarks
Drain 1	Potatoes	
Drain 2	Potatoes	
Ditch B	Potatoes, flowers	
Drain 3	Winter wheat	
Drain 4	Winter wheat	Double dose applied of Herold SC (diflufenican/flufenacet)
Ditch D	Winter wheat, sugar beet, yard run off	
Canal		

2.2.2 Sampling system

To be able to monitor the drain water with passive samplers, stainless steel pots were made to connect to the drains. The pots avoided the samplers to fall dry when the drain stopped giving water (Figure 2.4). To avoid water from entering the pots from the ditch, a floating tube was connected to the outlet of the pot.

Samplers for monitoring the ditches and the canal were installed in a sampling cage. To avoid that the samplers in the ditches would fall dry, the cage was installed in a bucket with holes just above the samplers to keep enough water in the bucket.

Figure 2.4 Installation of the samplers at the end of the drains

Figure 2.5 Installation of the samplers in the ditches

2.2.3 Sampling periods and analysis

The samplers were deployed in a period in spring (from March till May), in summer (August and September) and in winter (November till January). In springtime, the drains were already releasing water for a while; hence, the water of the end of the drainage period was monitored. The drains were running constantly during the deployment of these samplers. For the monitoring in summer and winter, the samplers were installed right at the beginning of the drainage period. During the summer monitoring the drains discharged water constantly. However, in wintertime the drains only released water in de the beginning of November and then again in January.
At the 24th of June a heavy rain event caused run-off. Yet, at that moment no samplers were installed in the ditch and potential effects on substance concentrations in the water have not been monitored.

The spring period deployment was considered a test run for the sampling system design, to guarantee that the flow in the pots was high enough to get a suitable sampled volume. Therefore, only a limited number of active compounds have been analysed. The spring samplers of ditch D were included in this analysis because of the double dose experiment on the field with winter wheat.

All the samplers deployed in summer and winter were analysed on a wide range of active compounds. In Appendix B, the total list of the analysed active compounds is given.

Table 2.2 Deployment period and days of the passive samplers with and information about analysis

Location	Sampling code	Period	Days	Analysis
Drain 1	Drain 1.1 Drain 1.2 Drain 1.3	18-3 to 10-5-2016 14-8 to 21-9-2016 11-11-2016 to 3-2-2017	54 69 90	Yes (limit # compounds) Yes Yes
Drain 2	Drain 2.1 Drain 2.2 Drain 2.3	18-3 to 10-5-2016 14-8 to 21-9-2016 11-11-2016 to 3-2-2017	54 69 90	Yes (limit # compounds) Yes Yes
Ditch B	Ditch B.1 Ditch B.2 Ditch B.3	18-3 to 10-5-2016 14-8 to 21-9-2016 11-11-2016 to 3-2-2017	54 69 90	No Yes Yes
Drain 3	Drain 3.1 Drain 3.2 Drain 3.3	16-3 to 10-5-2016 14-8 to 21-9-2016 11-11-2016 to 2-2-2017	56 69 90	Yes (limit # compounds) Yes Yes
Drain 4	Drain 4.1 Drain 4.2 Drain 4.3	16-3 to 10-5-2016 14-8 to 21-9-2016 11-11-2016 to 3-2-2017	56 69 90	Yes (limit # compounds) Yes Yes
Ditch D	Ditch D.1 Ditch D.2 Ditch D.3	16-3 to 10-5-2016 14-8 to 21-9-2016 11-11-2016 to 3-2-2017	56 69 90	Yes (limit # compounds) Yes Yes
Canal	Canal 1 Canal 2 Canal 3	18-3 to 10-5-2016 14-8 to 21-9-2016 11-11-2016 to 3-2-2017	54 69 90	No Yes Yes

2.3 Monitoring in the yard run off system

2.3.1 Sampling location yard run off system

At the Forward Farm, a measure is taken to decrease the emissions of crop protection products from yard run off. When the farmer is cleaning his machines after spraying, the water flows into a helophyte filter. Overflow water will be collected in a separate tank that is recirculated in the filters. This water will not enter the ditch. Rain water will not enter this filter, but will flow into a vessel (1.3m x 1.3m x 1.4m) with organic rich compost before it flows via a drain into the ditch. The compost is introduced as a binder for the active compounds. To get insight in the compounds that still enter the water after this measure, a sampler was installed at the end of the drain (Figure 2.6).
The samplers were deployed in the same three periods as the samplers in de drainage system and the complete list of active ingredients were analysed.

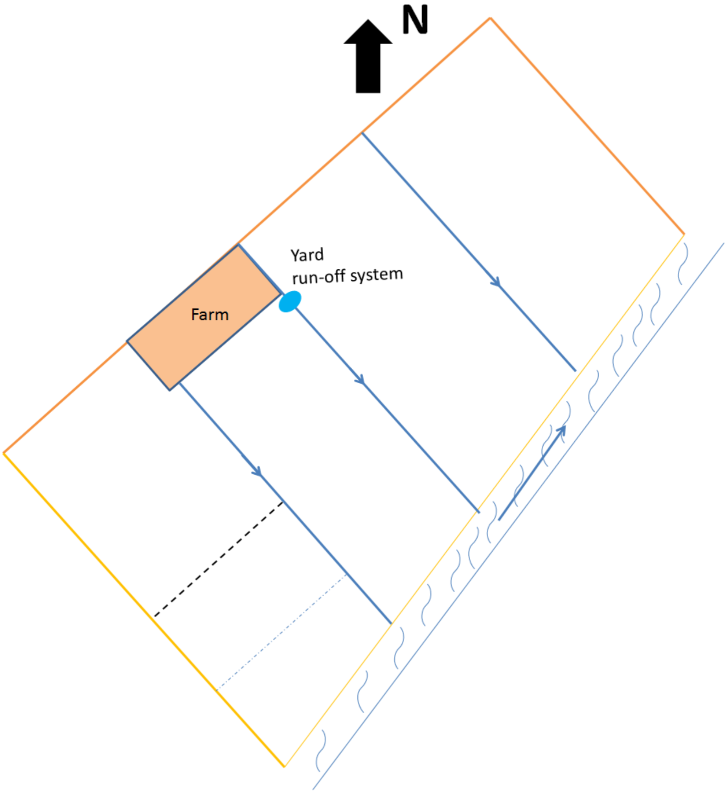

Figure 2.6 Sampling location of monitoring drain of yard run off system

2.4 Used passive samplers

Two types of passive samplers were used to monitor the active ingredients of the crop protection substances (Figure 2.7). One type is the silicone rubber passive sampler (SR). This is a partition-based sampler that accumulates compounds from the water phase because the solubility is better in the polymeric material of the sampler than in water. Uptake of the compounds is a diffusion driven process. With a faster water flow of the (drain) water, the transport of the compounds to the sampler is faster resulting in a higher sampling rate.

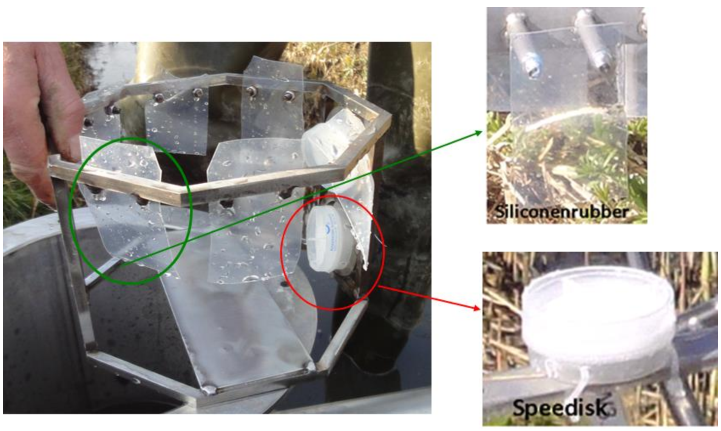

Figure 2.7 Deployed passive samplers

Silicone rubber samplers can reach equilibrium over time with the surrounding water phase, depending on the sampling rate and the water solubility of the compound. The more hydrophobic (less water soluble) compounds will take longer to reach equilibrium. As soon as a compound is in equilibrium, it will be released from the sampler when the water concentration deceases. This means that for a compounds that reaches equilibrium in a couple of days, only the average concentration of these last days is monitored. If the compound did not reach equilibrium, the measured concentration is the average of the whole deployment period.
The principle of the release of compounds is used to estimate the sampled volume (the amount of water that has been in contact with the sampler). Performance Reference Compounds (PRC's) are spiked onto the samplers before deployment, during sampling these compounds will be released. By analysing the remaining PRC's after deployment, the sampling rate can be modelled. The average dissolved water concentrations are calculated from the sampled volume and the amount of a compound accumulated by the sampler (Booij and Smedes, 2010).

The other used sampler is the Speedisk (SD). This is an adsorption sampler that binds the compounds and does not release them anymore. The determined concentration is an average concentration of the whole sampling period. Because the compounds are bound, the principle of PRC's to calculate the sampled volume cannot be applied. Therefore the sampled volume of Speedisk can only be estimated and the freely dissolved concentrations are indicative. The estimation is based on compounds that are accumulated by the both used samplers (in this case the polycyclic aromatic hydrocarbons). The amount of the compound measured on the Speedisk is divided by the concentration determined by the silicon rubber, resulting in the sampled water volume.

3 Results

The following chapter presents results in four main sections. First the compounds used and detected on the fields of drainage 1 and 2 (potato) and Ditch B are shown (paragraph 3.1.1 and 3.1.2) and secondly the field with drainage 3 and 4 (wheat) and the corresponding Ditch D (paragraph 3.1.3 and 3.1.4). The results of the canal (3.1.5) and the yard run-off drain (paragraph 3.2) are discussed separately, due to their unique position in the fields or connected influxes. In the presentation of the results, the main focus is on the compounds that have been applied onto the respective fields over the plant growth and sampling period. The compounds found on the passive samplers during the monitoring are summarized in the Appendix C.

3.1 Drain, ditch and canal concentrations

3.1.1 Drain 1 and 2

The period of active compound application was between spring and autumn 2016, starting at the 4th of May with linuron and ending on the 11th of October with chloorprofam. A complete overview of all compounds applied, per parcel lot and dated, is included in Appendix A. In the parcel lot of drain 1 and 2, 8 active compounds that had been applied were measured by the passive samplers (Table 3.1*Table 3.1*). Notice that the concentrations are given in ng/l. The time weighted average (TWA) is the period that is included in the average concentration; this is approximately half of the time it takes to reach equilibrium.
The active compound propamocarb was analysed on the SR, but because of its poor interaction with silicone rubber the concentration is not reliable and therefore not given.

In the first sampling period, before the application of the compounds, hardly any compounds were found on the samplers, or in low concentration of approx. 1 ng/l. The measured low concentrations of the compounds identified can be due to long residence times, causing a slow release via the drains. The first application of active compounds started within the last week of the first sampling campaign. There was no rain during this week. The concentrations detected in Drain 1.1 and Drain 2.1 can be seen as a blank background concentration in the drains caused by the slow release of compounds sprayed in earlier years.

In the second and third monitoring period, both the number of compounds and the concentrations increased. The highest concentrations were measured after the crop season in autumn/winter.

Part of the potato field, near Drain 2, has a higher organic matter content. It is assumed that more organic matter will bind more plant protection compounds and will result in lower concentrations in the drain. However, in spite of a higher organic matter content near Drain 2, the concentrations in this drain were higher compared to Drain 1 in the same period. Possibly the presence of preferential flow channels towards this drain caused a more effective leaching of the compounds.

Table 3.1: Measured concentration in Drain 1, Drain 2 and Ditch B. Sub-numericals indicate sampling periods mentioned in Table 2.2; spring, summer and autumn/winter period.SR= silicone rubber, SD = Speedisk.SD < = below limit of detection, - = not analysed (limited analysis package in spring) and X= compound was present on sampler but due to poor uptake of the compound by silicone rubber the concentration is not reliable. TWA= Time Weighted Average, time period for which the determined concentration is a time average concentration.

		Drain 1.1	Drain 1.2	Drain 1.3	Average TWA Drain 1	Drain 2.1	Drain 2.2	Drain 2.3	Average TWA Drain 2	Ditch B.2	Ditch B.3	Average TWA Drain 2
Sampler		**SR**	**SR**	**SR**		**SR**	**SR**	**SR**		**SR**	**SR**	
Compounds	**Cas number**	**ng/L**	**ng/L**	**ng/L**	**days**	**ng/L**	**ng/L**	**ng/L**	**days**			**days**
linuron	330-55-2	1.1	7.8	7.7	4	0.44	1.4	129	5	12	30	10
mandipropamid	374726-62-2	<	3.4	3.6	21	0.1	<	33	25	5.9	6	24
fluopicolide	239110-15-7	0.9	11	71	8	2.1	1.6	243	10	29	116	10
propamocarb	24579-73-5	<	X	<	0	X	<	<	0	<	<	0
chloorprofam	101-21-3	-	9.6	32	6	-	11	30	7	19	32	7
prosulfocarb	52888-80-9	-	0.1	<	All	-	0.9	0.3	All	1.5	3.9	All
cyazofamid	120116-88-3	<	<	1.5	14	<	<	12	16	3.4	1.4	16
difenoconazool	119446-68-3	<	<	1.1	7	0.4	<	15	8	1.1	1.6	8
Sampler		**SD**	**SD**	**SD**		**SD**	**SD**	**SD**		**Ditch B.2**	**Ditch B.3**	
Compounds	**Cas number**	**ng/L**	**ng/L**	**ng/L**		**ng/L**	**ng/L**	**ng/L**		**SD**	**SD**	
linuron	330-55-2	<	0.9	<		<	15	8		0.9	3	
mandipropamid	374726-62-2	<	0.9	0.48		<	21	6		0.9	2.	
fluopicolide	239110-15-7	<	5	11		<	69	126		8	7	
propamocarb	24579-73-5	<	3	<		5	7	<		*3*	7	
chloorprofam	101-21-3	-	<	2.7		-	<	2		4	113	
prosulfocarb	52888-80-9	-	<	<		-	<	<		<	<	
cyazofamid	120116-88-3	<	<	<		<	7	0.9		<	<	
difenoconazool	119446-68-3	<	<	<		<	5	1		<	<	

3.1.2 Ditch B

Ditch B is influenced by compounds deriving from Drain 1 and 2 and from drainage from flower fields (see Figure 2.3). The compounds that have been sprayed onto the potato field are compared with the analysed concentrations in Ditch B (see Table C.1 and C.2 in appendix). Metribuzin was found in the third sampling period in the ditch as well as in Drain 2, although it was not applied in 2016. This can be caused due to the application of this active compound in earlier years.

Concentrations in the ditch can be caused by emission from the drains or due to run off. If the concentration in the ditch exceeds the concentration in the drain 10 times, we assume that a surface / soil run off event influenced the concentration. However, no run-off event was reported at the Forward Farm during the sampling.

Prosulfocarb, cyazofamid and difenoconazole are only found in SR in low concentrations, similar to the respective measurements in the drains (Table 3.1). Even though prosulfocarb was present in an approximately ten times higher concentration, the low concentration does not indicate run-off. The concentrations of the other compounds were comparable or higher in the drainage water. Mandipropamid, for example, was measured in either similar or higher concentrations in both drains than in the ditch. Run-off events can therefore be excluded for these compounds.

The three most prominent compounds measured in the drains and ditch are fluopicolide, chloorprofam and linuron. These compounds are presented separately in Figure 3.1 to Figure 3.3.

3.1.2.1 Fluopicolide

Fluopicolide reached equilibrium in approximately 20 days (TWA= 10 days) with the SR sampler, depending on the water flow. With a higher flow, the uptake rate of the silicone rubber sampler is higher and therewith equilibrium is reached faster. The highest concentrations on SR were measured in the last sampling campaign in both drains (Figure 3.1). In Drain 1, no fluopicolide is measured on SD in the last period. Because this compound is in equilibrium within several days, this indicates that it was emitted from the drain in the last period of the monitoring in the autumn/winter period, and that the amount on the SD was too low to be detected.

In the SR in Drain 2, no fluopicolide is found in the summer period, while it was present in the SD. The time that this compound reaches equilibrium with the SR is shorter than the deployment time of the sampler in the water (equilibrium time is approx. 20 days). This means that when the water concentrations decreases during the last part of the sampling period the compound is released from the sampler, and in this case no detectable amount of compound was left. So because the compound was found on the SD but not anymore on the SR, this indicates that the compound was present in the first part of the summer sampling period and not anymore in de last part.

Fluopicolide is the compound with the highest measured concentrations in both samplers compared to the other compounds. The increase over time (highest concentrations in period 3) is caused by an increase in the application later in the growth season.

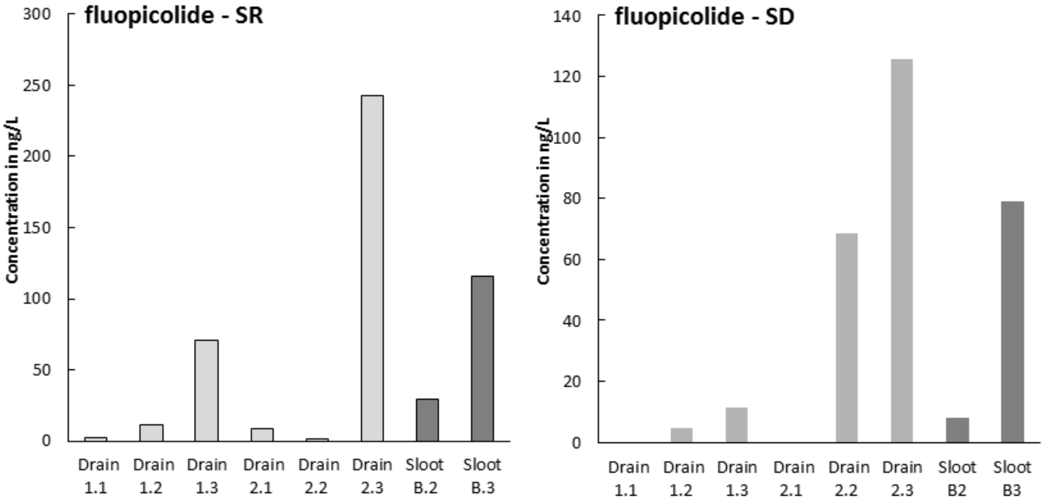

Figure 3.1 Measured concentration of fluopicolide in Drain 1 and 2 (light grey bars) and Ditch B (dark grey bars) over all sampling periods comparing silicone rubber (SR) and Speedisk (SD). 1=spring; 2=summer; 3=autumn/winter. Samplers of first sampling period of Ditch B were not analysed.

The highest concentration in both drainages is found after the main application period of fluopicolide in mid-September. It is not clear if the compound was present in the first flush of drain water in November, but it was certainly released via the drain during the second flush in January. This is because the compound was still present in the SR rubber although the time for equilibrium was shorter than the deployment time. This could also explain why it was also found in the first sampling period, if it was applied also during the previous crop season.

Fluopicolide was found on both samplers in the ditch and the concentration increases from the summer to the autumn sampling. There is no indication that spray caused a significant contribution to the concentration in the ditch, as fluopicolide was mostly applied in summer and the highest concentrations occurred during the autumn sampling. The influence of run-off cannot be estimated by lack of run-off events.

3.1.2.2 Chloorprofam

Chloorprofam was applied in the late season in October 2016, yet, it is also found in the SRs in the summer period. Possibly, chloorprofam was present in the drain water throughout the year, deriving from spraying in the previous growth season. But it was not analysed in the spring period due to the limited analysis package and therefore we don't know if it was also present in the first period. The additional application in the autumn was visible in the increased concentration in the SR in both drain tubes for the winter sampling. The same pattern occurred in the SD assessment.

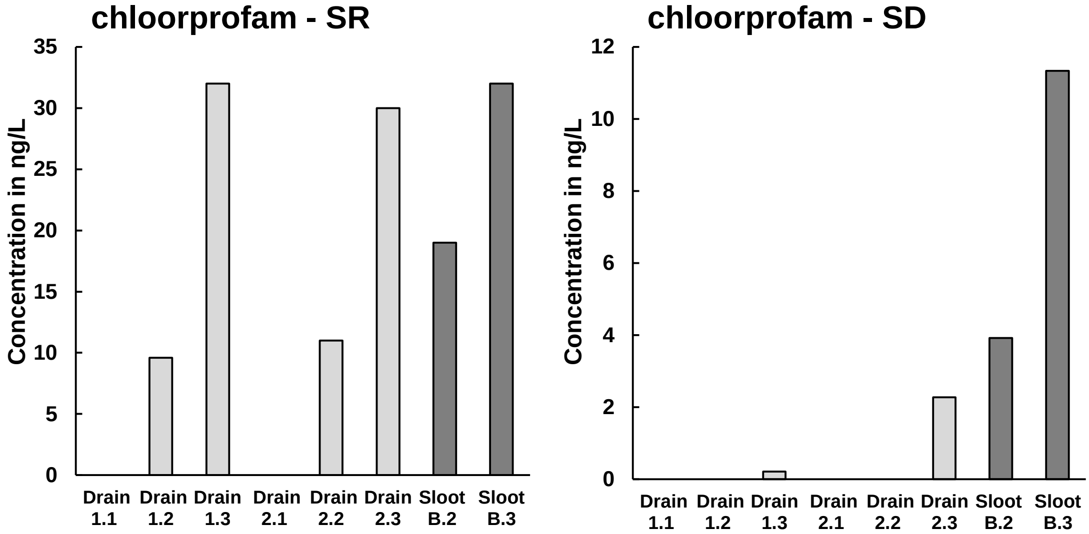

Figure 3.2: Measured concentration of chloorprofam in drains 1 and 2 (light grey bars) and Ditch B (dark grey bars) over all sampling periods comparing silicone rubber (SR) and Speedisk (SD). 1=Spring; 2=Summer; 3=autumn/winter. Samplers of first sampling period of Ditch B were not analysed.

Chloorprofam was found in both samplers of Ditch B. For SR, the summer measurement in the ditch shows a higher concentration than in the drains. This is probably related to an extra influx from the flower fields, which were sprayed with chloorprofam in early September 2016. The concentrations in the rubber sheets in the autumn/winter campaign are comparable for drain and ditch, with concentrations of about 30 ng/L.

3.1.2.3 Linuron

Linuron was sprayed onto the potato field in May 2016, between the spring and the summer sampling campaign. The background concentrations, measured in the first period, are relatively low and concentrations in Drain 1 remain on background levels. Drain 2 on the other hand, shows an increase in concentration in winter. As this is corresponding with other compounds, e.g. fluopicolide (see above), it can be assumed that the prolonged residence time in the soil caused this peak concentration. The pattern is similar for the SD, where no linuron was found in the initial measurement and little in Drain 1, while higher concentrations occur in Drain 2 during period 2 and 3.

Concentration of SR sampler Drain 2.3 was more than 10 times higher than measured as the SD. Linuron reached equilibrium in a couple of days. This indicates that the concentration at the end of the sampling period was higher than at the start since the average concentration on the SD determined over the whole sampling period is much lower.

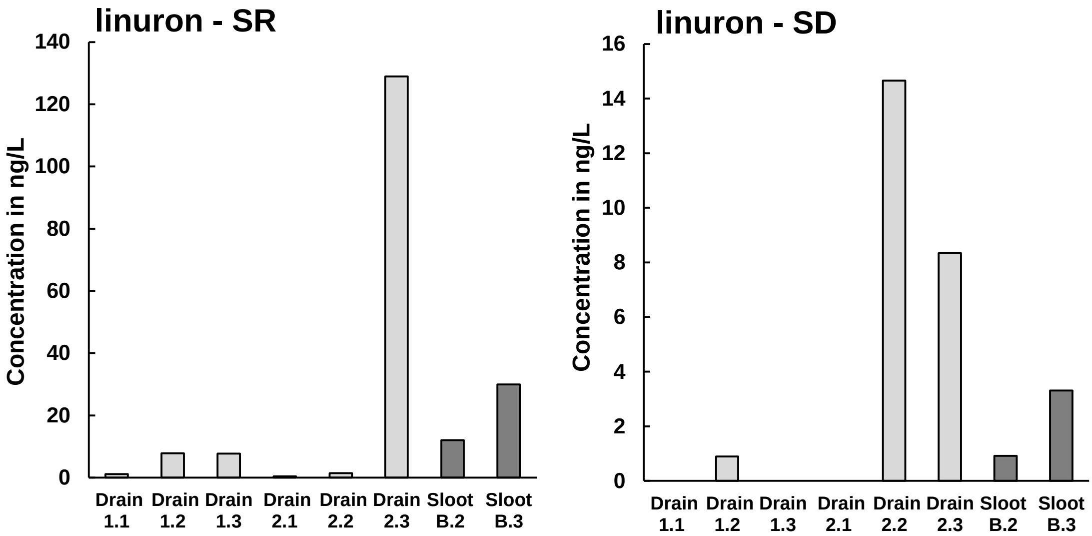

Figure 3.3: Measured concentration of linuron in Drain 1 and 2 (light grey bars) and Ditch B (dark grey bars) over all sampling periods for silicone rubber (SR) and Speedisk (SD). 1=Spring; 2=Summer; 3=autumn/winter. Samplers of first sampling period of Ditch B were not analysed at all.

Linuron was only applied onto the potato fields, therefor all measured concentrations in Ditch B should correspond to the concentration in Drain 1 and 2. Linuron was found in all samplers in the ditch. Ditch concentrations were lowers than drain concentrations, as to be expected as the ditch water is diluted, although the dilution rate of the ditches is low. The drains are a source of emission of linuron to the ditch water.

3.1.2.4 Comparison with grab water samples

In Ditch B, near the place where the samplers were installed, regular grab water samples were taken in May and October (results in Table C1 and C2 in Appendix C). In comparison, more compounds were found on the passive samplers. Pencycuron gives a remarkable result. In the water sample in May a high concentration of 250 ng/l is found. In the samplers deployed in the summer period, lower concentrations were detected, so the concentration had decreased. The compound may have been applied to the tulips and asters since it is permitted on flower bulbs that bloom in spring.
Fluopicolide shows the opposite. The water concentration measured in October was approx. ten times lower than the ditch concentration of the autumn/winter sampling. In this period the higher concentration was emitted from the drains.
The concentrations of BAM measured in the drains and ditch samplers and in the water samples of May and October are comparable. This means that the concentration of this compound is more or less constant over time.

3.1.3 Drain 3 and 4

In contrast to the field where Drain 1 and 2 were located, the compound application period for Drain 3 and 4 started earlier due to different crop seasonality. The crop protection substances were already applied in winter 2015 and ended in May 2016. All applied compounds are presented in Table 3.2. The active compound monochlorphenoxyacetic acid (MCPA) was detected on the SR, but because of its poor interaction with silicone rubber the concentration is not reliable and therefore not given.

Most compounds were applied already during winter 2015-2016 and overall the concentrations are lower than in the Drains 1 and 2, except for MCPA in Drain 4.2. This

compound was present in much lower concentrations in Drain 1 and 2 (Table C.3 and C.4 in the appendix). MCPA was sprayed in April and the highest concentration occurred in Drain 4 in the summer period.
Fenpropimorf, not analysed in the spring period, is only found in Drain 4. Prothioconazole was only present in spring.

The concentrations in Drain 3 and Drain 4 were comparable, so there seem to be no preferential leaching channels nearby one of the two drains.

Diflufenican and flufenacet were applied as a combinatory mix in the spring period and are discussed in more detail in Paragraph 3.1.4.1.The compounds epoxiconazole and bixafen were found during the whole monitoring period and are presented in more detail in paragraph 3.1.4.2 and 3.1.4.3.

Table 3.2: Measured concentration in drain 3, drain 4 and Ditch D. Sub-numericals indicate sampling periods mentioned in Table 2.2; spring, summer and autumn/winter period.SR= silicone rubber, SD = Speedisk.SD < = below limit of detection, - = not analysed (limited analysis package in spring) and X= compound was present of sampler but due to poor uptake of the compound by silicone rubber the concentration is not reliable and therefore not mentioned. TWA= Time Weighted Average, time period in which the determined concentration is a time average concentration.

		Drain 3.1	Drain 3.2	Drain 3.3	Average TWA Drain 3	Drain 4.1	Drain 4.2	Drain 4.3	Average TWA Drain 4	Ditch D.1	Ditch D.2	Ditch D.3	Average TWA Ditch D
Sampler		**SR**	**SR**	**SR**		**SR**	**SR**						
Compound	**CAS Number**	**ng/L**	**ng/L**	**ng/L**	**days**	**ng/L**	**ng/L**	**days**					**days**
diflufenican	83164-33-4	-	<	3.2	All	-	9	2.6	All	-	1.9	4.3	20
flufenacet	142459-58-3	10	0.021	0.3	23	50	1.8	0.54	29	57	0.9	1.6	23
MCPA	94-74-6	-	X	X		-	X	X		-	X	X	
epoxiconazole	135319-73-2	17	0.18	6.4	61	14	14	6.4	69	36	5.2	6.8	36
fenpropimorf	67564-91-4	-	<	<	39	-	16	0.54	All	-	2.5	0.2	14
bixafen	581809-46-3	0.3	0.43	1.4	45	0.63	7.4	2.6	66	3.4	9.0	3.2	16
prothioconazole	178928-70-6	1.8	<	<	51	12	<	<	64	20	<	<	14
		SD	**SD**	**SD**		**SD**	**SD**	**SD**					
Compound	**CAS Number**	**ng/L**	**ng/L**	**ng/L**		**ng/L**	**ng/L**	**ng/L**					
diflufenican	83164-33-4	-	<	<		-	<	<		-	<	<	
flufenacet	142459-58-3	<	<	<		30	<	<		5	0.1	1	
MCPA	94-74-6	-	14	2		-	943	1		-	*29*	*94*	
epoxiconazole	135319-73-2	5	3	0.8		2	14	1		3	1	7	
fenpropimorf	67564-91-4	-	<	<		-	12	<		-	<	<	
bixafen	581809-46-3	<	3	0.5		<	8	<		0.5	2	2	
prothioconazole	178928-70-6	9	<	<		3	<	<		<	<	<	

3.1.4 Ditch D

Ditch D is influenced by compounds deriving from Drains 3 and 4. The application period of crop protection products ending up in Ditch D started in the beginning of November 2015 and ended half of September 2016.
In total 18 compounds were used on fields connected to Ditch D. Two compounds, diflufenican and epoxiconazole, were used on both fields. Likewise with Ditch B, the focus is set on compounds that were sprayed in the fields and their relation with ditch concentrations.

Diflufenican and fenpropimorf, both only analysed in summer and autumn, are only detected in SR and show comparable concentrations in the drain- and ditch water (Table 3.2)
Prothioconazole is only found during the first monitoring period in the ditch. This is also the only period that the compound was found in the drain water and therewith the influx for the ditch. The compound is applied after the monitoring in spring, so the prothioconazole in the drains and ditches originates from earlier applications.
MCPA shows the highest concentrations in the summer period in both the drains and the ditch. This compound is diluted since the concentration in the ditch is about ten times lower than the concentration in the drain water of Drain 4.

3.1.4.1 Flufenacet / Diflufenican

Flufenacet is present in higher concentrations in the first monitoring period and decreases over the year. The concentrations in Drain 4 are about 5 time higher concentrations than in drain 3. A double dose of the crop protection substance led to those increased concentrations. The compound was applied in November 2015 and only measured in the spring period. After spring, the concentration decreased and only low amounts of several ng/l are measured. Since no measurement was done directly after application, it is not clear if even higher concentrations entered the drain water in winter and the large flush of this compound already took place before the spring monitoring. The highest concentration in the ditch was also measured during the spring period. As the compound was not applied in that period, emission due to drift did not happen and as no run-off event took place, the influx comes directly from drain 3 and 4.

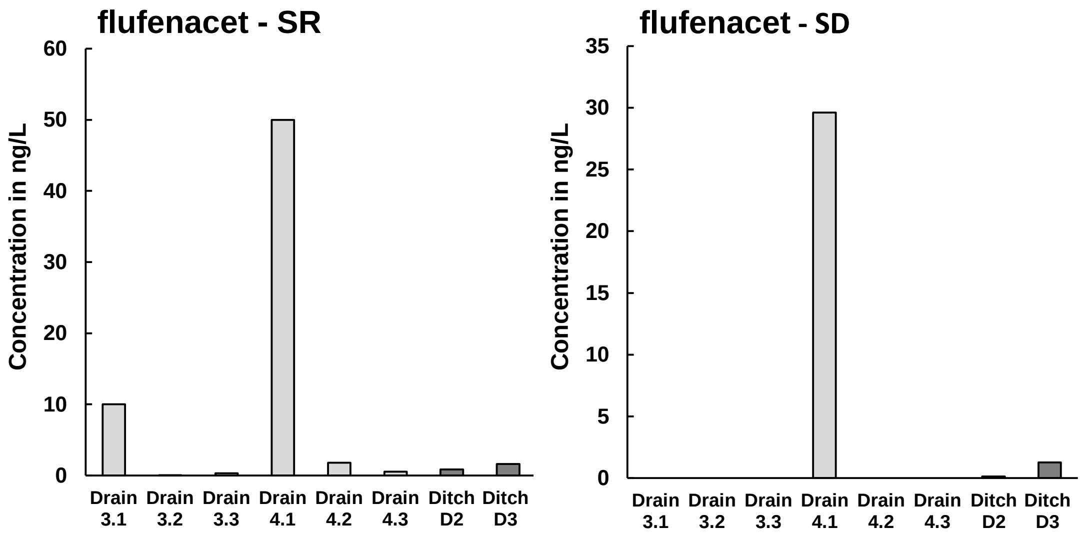

Figure 3.4: Measured concentration of flufenacet in Drain 3 and 4 light grey bars and Ditch D dark grey bars over all sampling periods comparing silicone rubber (SR) and Speedisk (SD). 1=Spring; 2=Summer; 3=autumn/winter.

Diflufenican is found in lower concentrations compared to flufenacet. The amount of diflufenican in the plant production product Herculus SC is twice as low as flufenacet. Moreover, diflufenican is a more hydrophobic compound resulting in a stronger binding to soil organic matter and therefore probably less release to the drains. Since the compound was not analysed in spring due to the limited analytical package, it is unclear if this compound was present during that period. Nevertheless, the measured concentrations are low with a maximum of 9 ng/l.

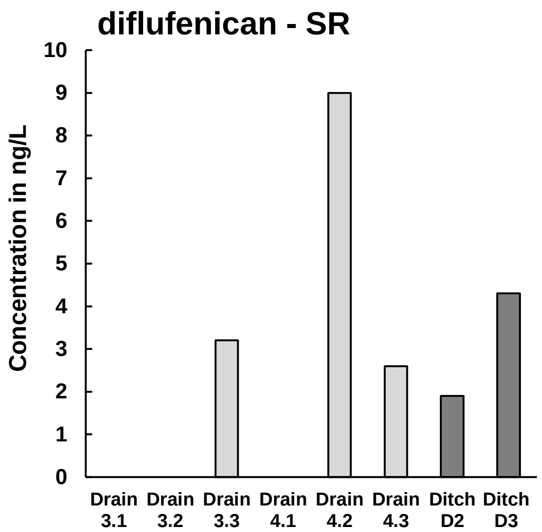

Figure 3.5: Measured concentration of diflufenican in Drain 3 and 4 (light grey bars) and Ditch D (dark grey bars) for silicone rubber (SR). 1=Spring; 2=Summer; 3=autumn/winter. The compound was not measured during the spring period.

3.1.4.2 *Epoxiconazole*

Epoxiconazole was not in equilibrium with the SR samplers and therefore the concentrations are an average concentration over the whole sampling period. The uptake of this compound by SR is good and therefore only the results of the SR samplers are given in Figure 3.6. Epoxiconazole is the only applied compound which is found in the silicone rubber samplers over the entire monitoring period.

The concentrations in Drain 4 were low and relatively constant over the year. In Drain 3, hardly any epoxiconazole was detected in summer time, whereas the compound was applied in May. The compound is hydrophobic and can therefore bind to organic matter. This might explain that it enters the drain water more or less constantly, both before, during and after the application.

The highest concentration occurs in the ditch in the spring period. Other drains or connected fields might cause some extra influx.

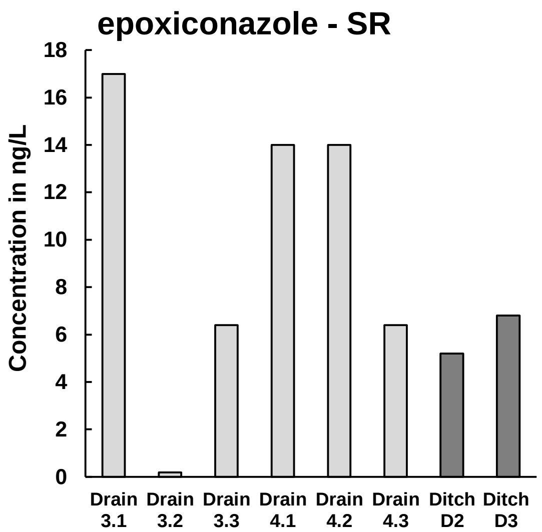

Figure 3.6. Measured concentration of epoxiconazole in Drain 3 and 4 (light grey bars) and Ditch D (dark grey bars) over all sampling periods measured in silicone rubber (SR). 1=spring; 2=summer; 3=autumn/winter.

3.1.4.3 *Bixafen*

Bixafen did not at all or hardly reach equilibrium with the SR and therefore the concentrations are an average over the whole sampling period. The uptake by SR of this compound is good and therefore only the results of the SR samplers are given.

Bixafen is detected in all SR samplers in low concentrations. The highest concentrations were measured during the summer period (Figure 3.7). The compound is applied in May and enters the drain with the first flush of the drains in summer time so the retention time is relatively short.
The concentrations in the ditch are related to the influx from drain 3 and 4, which also show the highest concentrations in the summer period.

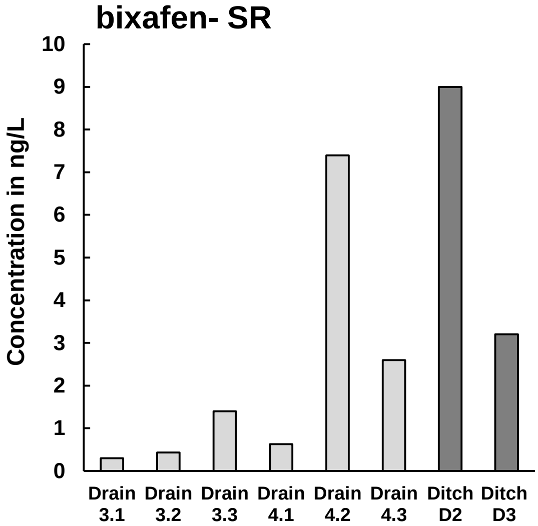

Figure 3.7: Measured concentration of bixafen in Drain 3 and 4 (light grey bars) and Ditch D (dark grey bars) over all sampling periods for silicone rubber (SR). 1=Spring; 2=Summer; 3=autumn/winter.

3.1.4.4 *Comparison with grab samples*

The passive samplers in Ditch D and Drain 3 and 4 revealed more compounds than the grab water samples. A remarkable high concentration of pencycuron was measured in Ditch D in May as compared to ditch B. The origin might be the spraying of the field with flowers during spring time, although this information is not available.
Chloorprofam was measured in a concentration of 460 ng/L in October, and upstream the concentrations were even ten times higher. The passive samplers also indicated the highest concentrations in autumn, however the drain concentrations were approximately ten times lower. It is possible that the high concentrations of this compound originate from emissions from yard run off, since water from the run-off system is released into this ditch.
Metolachloor shows the highest concentration in the water samples in May compared to October. The concentrations are higher than the concentrations in the passive samplers in the drains and ditch. This compound is allowed for application in tulips and it might have been applied on the neighbouring field and entered via drift into the ditch.

3.1.5 Canal

The canal water is connected to the drains via the ditches. The canal was only monitored in summer and autumn/winter.

Of the 28 compounds that were applied on the test fields or detected in the ditches connected to these fields, 22 were detected in the canal. However, the canal water is also influenced by application of crop protection compounds upstream.

MCPA showed the highest concentrations (based on SD estimated at 500 ng/l), and these were measured in the autumn/winter period. The compound was detected in Drain 4 in a concentration twice as high, however, this was in the summer period. The concentration in Ditch D in the sampling period was lower than the concentration in the canal.

Fluopicolide was measured in high concentrations compared to the other compounds and it has similar concentrations in SR and SD samplers for both periods. For SR the compound is in equilibrium in a couple of days, this indicates that the concentration for this compound is relatively constant in the canal during summer and autumn/winter. The concentrations in the ditches show a larger variation in time, but the concentrations in the ditches are also relatively constant. The flow of the ditches is small compared to the volume of the canal so it is unlikely that the complete concentration is caused by compounds originating from these drains, but they will certainly contribute to it.

Table 3.3 Measured concentration in the canal. Sub-numericals indicate sampling periods mentioned in Table 2.2; summer and autumn/winter period.SR= silicone rubber, SD = Speedisk.SD < = below limit of detection, and X= compound was present of sampler but due to poor uptake of the compound by silicone rubber the concentration is not reliable and therefore not mentioned. TWA= Time Weighted Average, time period in which the determined concentration is a time average concentration.

		canal 1.2		canal 1.3		Average TWA
Sampler		**SR**	**SD**	**SR**	**SD**	
Compound	**CAS Number**	**ng/L**	**ng/L**	**ng/L**	**ng/L**	**days**
trifloxystrobin	141517-21-7	0.2	2	<	<	All
pyraclostrobin	175013-18-0	2.1	0.5	0.2	<	All
prosulfocarb	52888-80-9	0.4	<	0.7	<	78
propamocarb	24579-73-5	X	0.4	<	<	
MCPA	94-74-6	X	2	X	504	
mandipropamid	374726-62-2	5.2	0.7	7	4	11
linuron	330-55-2	1.8	<	8.2	<	2
lenacil	2164-08-1	19	<	<	<	0,3
isoproturon	34123-59-6	4.5	<	8.5	<	0,7
fluopicolide	239110-15-7	41	14	43	30	4
flufenacet	142459-58-3	0.03	<	0.7	<	33
desmedifam / fenmedifam	13684-56-5 / 13684-63-4	0.3	<	0.3	<	6
ethofumesaat	26225-79-6	8.4	2	<	<	3
epoxiconazole	135319-73-2	3.1	1	2.6	2	64
dimethenamid (-P)	87674-68-8	6.7	2	2.2	<	2
diflufenican	83164-33-4	0.6	<	<	<	All
difenoconazool (som)	119446-68-3	0.6	<	0.4	<	All
cyproconazool (som)	94361-06-5	3.9	<	8.9	3	3
cyazofamid	120116-88-3	0.3	<	0.3	<	7
chloorprofam	101-21-3	8.4	4	11	9	4
bixafen	581809-46-3	1.7	0.4	1.3	3	21
metribuzin	21087-64-9	<	<	1.3	<	0.1

3.2 Drain Yard run-off system (Yard)

The drain of the yard run-off system (Yard) shows overall the highest concentrations compared to the other measurements in drains and ditches. Table 3.4 shows only compounds that exceed at least once a concentration of 100 ng/L, which is high in comparison to the other drains or surface water samples. The total list with measured concentrations is given in Table C.7 and C.8 in the appendix.

Table 3.4: Measured concentration in the drain of the yard run-off system. Sub-numericals indicate sampling periods mentioned in Table 2.2; summer and autumn/winter period.SR= silicone rubber, SD = Speedisk.SD < = below limit of detection, and X= compound was present of sampler but due to poor uptake of the compound by silicone rubber the concentration is not reliable and therefore not mentioned. TWA= Time Weighted Average, time period in which the determined concentration is a time average concentration.

		Drain Yard.1		Drain Yard.2		Drain Yard.3		Average TWA
Sampler		**SR**	**SD**	**SR**	**SD**	**SR**	**SD**	
Compound	**CAS Number**	**ng/L**	**ng/L**	**ng/L**	**ng/L**	**ng/L**	**ng/L**	**days**
linuron	330-55-2	53	16	197	44	318	173	8
metamitron	41394-05-2	194	5	196	295	122	52	0.1
fluoxastrobin	361377-29-9	3	3	2.3	3	7.8	7	66
metribuzin	21087-64-9	64	11	103	57	152	43	0.5
flutolanil	66332-96-5	5.6	<	42	11	616	309	14
BAM	2008-58-4	53	28	<	71	137	113	0.2
ethofumesaat	26225-79-6	292	66	351	259	557	213	12
carbendazim	10605-21-7	146	32	109	36	48	25	0.5
chloortoluron	15545-48-9	11	79	<	943	<	588	2
isoproturon	34123-59-6	2230	601	861	475.3	1240	445	3
lenacil	2164-08-1	13	<	1660	232	1140	222	1
chlorantranilliprole	500008-45-7	<	<	<	<	256	158	1
fluopicolide	239110-15-7	111	113	69	144	371	654	17
fluopyram	658066-35-4	28	17	51	34	268	216	70
f**lufenacet**	142459-58-3	156	156	52	75	84	72	All
bentazon	25057-89-0	36	158	<	252	<	79	0.1
MCPA	94-74-6	X	102	X	366	X	721	
chloorprofam	101-21-3	5640	4763,0	1560	2410	1740	3716	13
dimethenamid (-P)	87674-68-8	4960	1854,9	3990	2547	1830	8843	6
metolachloor (-S)	51218-45-2	4590	4303,2	2650	2190	2510	1771	25

The three compounds at the end of the table, chloorprofam, dimethenamid (-P) and metolachloor (-S) have extremely high concentrations which can be explained.

In 2015, an incident with chloorprofam occurred. A pile of soil was stored, on the part of the yard close to the run-off system. The farmer was cleaning his machine which had been used for spraying chloorprofam. This cleaning water drained via the helophyte filter, but part of this water was soaked by the soil, as observed during the incident. With heavy rain fall the chloorprofam was flushed into the yard run-off system and still leaking in high concentrations to the drain of this system into the ditch.

Dimethenamid (-P) and metolachloor are active compounds that are applied in the production of onions. In spring 2016, during the drain water monitoring, a pile of onion skins were stored on the yard near by the run-off system. The high concentrations are probably caused by

emission of these compounds from the skins during rain fall. It is not clear if the yard run-off system reduced the released concentrations.
These incidents indicate that yard run-off is a serious source of active compounds in ditches. The concentrations in the grab samples from the ditch were a ten times lower (data not shown), so these data tend to underestimate this source.

There is no explanation for the remaining 18 substances in the table. They might have entered the compost by cleaning events in the past followed by a slow release, maybe due to further degradation of the organic matter that binds the active compounds.

Of these 18 compounds, isoproturon has some high concentrations. This active compound was still permitted in one crop protection product, Javelin. Since January 2017, its use is not allowed anymore. Shortly before a compound is taken out of (legal) use, the application is often increased to finish the stockpile. Javelin was used in November 2015 for application on the sugar beet field.
Diflufenican was the other active compound in Javelin, but present in a lower amount than isoproturon. Both the lower amount and the fact that it is more hydrophobic than isoproturon (making it less prone to leaching), contribute to lower concentrations in the ditch.

Another high concentration was found for lenacil in the summer and autumn/winter period. It is no constant emission from the system since no lenacil was found in spring. Thereby, lenacil is quite hydrophilic and will not bind that strongly to organic matter. This compound is applied on the sugar beets in April and May. But since the water of the cleaning of the machines does not enter the run-off system and it was not found in spring, these compounds cannot originate from the application of the compound. The reason for the higher concentrations remains unclear.

4 Conclusions

4.1 General

The monitoring with passive samplers worked well. They were easy to apply, good sampling rates were obtained and it was no problem when a drain temporarily stopped supplying water during the deployment period. The combination of the two types of samplers gave an indication in which part of the sampling period the compounds were drained.
Compared to the water samples, more compounds were detected on the samplers. The data show that higher concentrations are present at irregular moments that vary among compounds. Therefore it is hard to predict what the right moment is for taking water samples. Due to the design of the sampling device the samplers could be deployed for several weeks, and by a combination of the two types if samplers a reduction in the risk of missing compounds can be gained.

4.2 Drains and ditches

- Many of the compounds applied on the fields are released by the drains. The measured concentrations varied per compound and between the periods
- Most concentrations were present in a range between 1 and 100 ng/L (0.1 µg/L).
- From the applied compounds, linuron, fluopicolide propamocarb and MCPA were found in the drain water in the highest concentrations, up to 129, 243, 250 and 943 ng/L, respectively.
- A higher dose of the crop protection product with diflufenican/flufenacet resulted in a higher concentration flufenacet. Diflufenican did not show higher concentrations, probably because the compound is more hydrophobic and will bind stronger to soil organic matter.
- Drain 2 showed higher concentrations than Drain 1 although they were installed in the same field and the organic matter content nearby Drain 2 is higher. This is possibly caused due to preferential flow paths in the soil, which result in faster leaching of compounds to the drains.
- Many compounds were emitted in the autumn/winter season, after the application, due to retention in the soil. Emission via drains is therefore a source of active compounds of crop protection compounds in periods when they are not applied and not entering the water via drift.
- The concentrations in the ditches were comparable to the concentrations in the drains, indicating that the water was not influenced by run-off during the monitoring periods. The only reported run-off event in 2016 was in June, unfortunately when the samplers were not installed and this event was missed in the monitoring.
- For many compounds, the concentrations in the canal were comparable to the concentrations in the ditches. The ditches may influence the concentration of the canal, but since the volume is limited, it is not likely to increase the concentrations.

4.3 Yard run-off system

- 21 compounds were present in the drain water from the yard run-off system in concentrations above 100 ng/L (0.1 µg/L).
- Most of these compounds are emitted at a relatively constant concentration. They were adsorbed by the compost in the past and are slowly released.
- Not all compounds bind equally strong, so some compounds are released in higher concentrations.

- Three compounds, chloorprofam, dimethenamid (-P) and metolachloor, were present in high concentrations during the monitoring periods in spring, summer and autumn/winter. These concentrations were caused by two incidents in 2015 and the beginning of 2016, which have long-term effects on the leaching from the organic matter in the run-off system.
- These incidents show that even with a system to prevent the active compounds to enter the ditch, yard-run off is a serious source of active compounds in the surface water.
- The system in use might be optimised for better performance by more frequently replacing the compost and possibly adding substances suitable for binding more hydrophilic compounds.

5 Literature references

Delsman, J.R. (2015).Saline groundwater – surface water interaction in coastal lowlands. PhD-thesis.

Booij, K. and Smedes, F. (2010). An improved method for estimating in situ sampling rates of nonpolar passive samplers. Environ. Sci. Technol. 44, pp 6789-6794.

A Overview of applied compounds

Table A.1 Applied active compounds with application day

1A perceel recht van boerderij WINTERTARWE		grenzend aan drainsloot			
04-11-15	diflufenican/flufenacet	isoproturon/diflufenican			
14-04-16	monochloorphenoxiazijnzuur	cycocel	trinexapac-ethyl	epoxiconazole	Hulpstof depositieverbeteraar
03-05-16	cycocel				
06-05-16	epoxiconazole/fenpropimorf				
25-05-16	bixafen/prothioconazole	lambda-cyhalothrin			
1B Perceel achter boerderij SUIKERBIETEN					
19-03-16	glyfosaat				
12-04-16	metamitron	ethofumesaat/fenmedifam/desmedifam/lenacil	koolzaadolie		
01-05-16	metamitron	ethofumesaat/fenmedifam/desmedifam/lenacil	ethofumesaat		
09-05-16	metamitron	ethofumesaat/fenmedifam/desmedifam/lenacil	triflusulfuron-methyl		
18-05-16	clopyralid	koolzaadolie			
24-05-16	metamitron	ethofumesaat/fenmedifam/desmedifam/lenacil	dimethenamide-P	ethofumesaat	
31-05-16	metamitron	ethofumesaat/fenmedifam/desmedifam/lenacil	dimethenamide-P		
21-07-16	fenpropidin/defenaconazole				
23-08-16	epoxiconazole/pyraclostrobine				
21-09-16	cyproconazole/trifloxistrobin				
2A Perceel links naast boerderij TULPEN		verhuurd en geen spuitgegevens beschikbaar		niet grenzend aan drainsloot	
2B Perceel links naast de tulpen ZOMERBLOEMEN		verhuurd en geen spuitgegevens beschikbaar		grenzend aan drainsloot	

3 Perceel geheel links AARDAPPELEN		grenzend aan drainsloot		
04-05-16	linuron	prosulfocarb	aclonifen	
10-05-16	glyfosaat	koolzaadolie	Hulpstof depositieverbeteraar	
01-06-16	mandipropamid			
11-06-16	mandipropamid	Hulpstof depositieverbeteraar		
17-06-16	mandipropamid			
22-06-16	mandipropamid	Hulpstof depositieverbeteraar		
28-06-16	mandipropamid	Hulpstof depositieverbeteraar		
04-07-16	fluopicolide/propamocarb	Hulpstof depositieverbeteraar		
12-07-16	fluopicolide/propamocarb	*Karate zeon*	Hulpstof depositieverbeteraar	
21-07-16	fluopicolide/propamocarb	difenoconazool		
29-07-16	cyazofamid	Hulpstof depositieverbeteraar		
01-08-16	maleïne hydrazide			
06-08-16	difenoconazool	cyazofamid	Hulpstof depositieverbeteraar	
12-08-16	cyazofamid	Hulpstof depositieverbeteraar		
22-08-16	mancozeb	mancozeb	mancozeb	cyazofamid
27-08-16	cyazofamid			
05-09-16	cyazofamid			
15-09-16	carfentrazone-ethyl			

3 Perceel geheel links AARDAPPELEN		grenzend aan drainsloot		
10-10-16	chloorprofam in de schuur			
10-05-16	glyfosaat	koolzaadolie	Hulpstof depositieverbeteraar	
20-05-16	linuron	prosulfocarb	aclonifen	
21-05-16	prosulfocarb	*Mistral 70 wg*		
01-06-16	mandipropamid			
11-06-16	mandipropamid	Hulpstof depositieverbeteraar		
17-06-16	mandipropamid			
21-06-16	metribuzin			
22-06-16	mandipropamid	Hulpstof depositieverbeteraar		
28-06-16	mandipropamid	Hulpstof depositieverbeteraar		
04-07-16	fluopicolide/propamocarb	Hulpstof depositieverbeteraar		
12-07-16	fluopicolide/propamocarb	Karate zeon	Hulpstof depositieverbeteraar	
21-07-16	fluopicolide/propamocarb	difenoconazool		
29-07-16	fluopicolide/propamocarb	Hulpstof depositieverbeteraar		
01-08-16	maleïne hydrazide			
06-08-16	difenoconazool	cyazofamid	Hulpstof depositieverbeteraar	
12-08-16	cyazofamid	? Hulpstof depositieverbeteraar		
19-08-16	difenoconazool	cyazofamid		
19-08-16	mancozeb	mancozeb	Penncozeb dg	cyazofamid
27-08-16	cyazofamid			
05-09-16	cyazofamid			
17-09-16	fluopicolide/propamocarb			
19-09-16	carfentrazone-ethyl			
11-10-16	chloorprofam in de schuur	*Tuberprop easy*		

Table A.2: Overview of applied plant protection products which contains the active compounds

Active compound	Product
aclonifen	Challenge
bixafen/prothioconazole	Aviator xpro
carfentrazone-ethyl	Spotlight plus
chloorprofam	Tuberprop easy
chloorprofam	Nogerma starter
clopyralid	Lontrel 100
cyazofamid	Ranman top
cycocel	Cecece
cyproconazole/trifloxistrobin	Sphere
difenoconazool	Narita
diflufenican/flufenacet	Herold sc
dimethenamide-P	Frontier optima
dimethenamide-P	Frontier optima
epoxiconazole	Opus team
epoxiconazole/fenpropimorf	Opus team
epoxiconazole/pyraclostrobine	Retengo plust
ethofumesaat	Ethosat 500 sc
ethofumesaat	Oblix 200 ec
ethofumesaat/fenmedifam/desmedifam/lenacil	Betanal maxxpro
fenpropidin/defenaconazole	Spyrale
fluopicolide/propamocarb	Infinito
glyfosaat	Glyfosaat vloeibaar gdc
isoproturon/diflufenican	Javelin
koolzaadolie	Spoiler
lambda-cyhalothrin	Karate zeon
linuron	Afalon sc
maleïne hydrazide	Himalaya
mancozeb	Dithane dg newtec
mancozeb	Manconyl 2
mancozeb	Penncozeb dg
mancozeb	Penncozeb sc
mandipropamid	Revus
metamitron	Aako goltix 700 sc
metribuzin	Mistral 70 wg
MCPA	Agroxone mcpa
prosulfocarb	Boxer
triflusulfuron-methyl	Safari
trinexapac-ethyl	Moddus 250 ec

B List of analysed compounds

Compound	Method	Cas number	Compound	Method	Cas number
naftaleen	GCMS-EI	91-20-3	dodemorf (som)	GCMSMS	1593-77-7
acenaftyleen	GCMS-EI	208-96-8	endosulfan-alfa	GCMSMS	959-98-8
acenafteen	GCMS-EI	83-32-9	esfenvaleraat (fenvaleraat-alfa)	GCMSMS	66230-04-4
fluoreen	GCMS-EI	86-73-7	ethofumesaat	GCMSMS	26225-79-6
fenantreen	GCMS-EI	85-01-8	ethoprofos	GCMSMS	13194-48-4
antraceen	GCMS-EI	120-12-7	etridiazool	GCMSMS	2593-15-9
fluoranteen	GCMS-EI	206-44-0	famoxadone	GCMSMS	131807-57-3
pyreen	GCMS-EI	129-00-0	fenamifos	GCMSMS	22224-92-6
benzo(a)antraceen	GCMS-EI	56-55-3	fenitrothion	GCMSMS	122-14-5
chryseen	GCMS-EI	218-01-9	fenoxycarb	GCMSMS	72490-01-8
benzo(b)fluoranteen	GCMS-EI	205-99-2	fenpropimorf	GCMSMS	67564-91-4
benzo(k)fluoranteen	GCMS-EI	207-08-9	fenvaleraat	GCMSMS	51630-58-1
benzo(a)pyreen	GCMS-EI	50-32-8	fluazifop-butyl	GCMSMS	69806-50-4
indeno(123-cd)pyreen	GCMS-EI	139-39-5	haloxyfop-P-methyl	GCMSMS	69806-40-2
dibenzo(ah)antraceen	GCMS-EI	53-70-3	iprodion	GCMSMS	36734-19-7
benzo(ghi)peryleen	GCMS-EI	190-86-3	kresoxim-methyl	GCMSMS	143390-89-0
2,4-dinitrophenol	GCMSMS	51-28-5	lindaan	GCMSMS	58-89-9
2-aminoacetophenon	GCMSMS	551-93-9	malathion	GCMSMS	121-75-5
aclonifen	GCMSMS	74070-46-5	metazachloor	GCMSMS	67129-08-2
aldrin	GCMSMS	309-00-2	methiocarb	GCMSMS	2032-65-7
anthraquinone	GCMSMS	84-65-1	metolachloor (-S)	GCMSMS	51218-45-2
atrazine	GCMSMS	1912-24-9	metribuzin	GCMSMS	21087-64-9
atrazine-desethyl	GCMSMS	6190-65-4	oxydemeton-methyl	GCMSMS	301-12-2
bifenox	GCMSMS	42576-02-3	parathion-ethyl	GCMSMS	56-38-2
bifenthrin	GCMSMS	82657-04-3	parathion-methyl	GCMSMS	298-00-0
broompropylaat	GCMSMS	18181-80-1	pendimethalin	GCMSMS	40487-42-1
bupirimaat	GCMSMS	41483-43-6	permethrin-cis	GCMSMS	52645-53-1
carbaryl	GCMSMS	63-25-2	permethrin-trans	GCMSMS	52645-53-1
carbofuran	GCMSMS	1563-66-2	permethrin (som)	GCMSMS	52645-53-1
chloorfenvinfos	GCMSMS	470-90-6	pirimicarb	GCMSMS	23103-98-2
chloorprofam	GCMSMS	101-21-3	pirimifos-methyl	GCMSMS	29232-93-7
chloorpyrifos-ethyl	GCMSMS	2921-88-2	procimidon	GCMSMS	32809-16-8
cinidon-ethyl	GCMSMS	142891-20-1	propoxur	GCMSMS	114-26-1
clomazon	GCMSMS	81777-89-1	propyzamide	GCMSMS	23950-58-5
cyfluthrin (som)	GCMSMS	68359-37-5	prosulfocarb	GCMSMS	52888-80-9
cyhalothrin-lambda	GCMSMS	91465-08-6	pyrimethanil	GCMSMS	53112-28-0

Compound	Method	Cas number	Compound	Method	Cas number
cypermethrin (som)	GCMSMS	52315-07-8	simazine	GCMSMS	122-34-9
cyprodinil	GCMSMS	121552-61-2	tebufenpyrad	GCMSMS	119168-77-3
DEET	GCMSMS	134-62-3	terbutylazine	GCMSMS	5915-41-3
deltamethrin	GCMSMS	52918-63-5	terbutryn	GCMSMS	886-50-0
diazinon	GCMSMS	333-41-5	tetramethrin-cis	GCMSMS	7696-12-0
dichlobenil	GCMSMS	1194-65-6	tetramethrin-trans	GCMSMS	7696-12-0
dichlofluanide	GCMSMS	1085-98-9	tetramethrin (som)	GCMSMS	7696-12-0
BAM	GCMSMS	2008-58-4	tolclofos-methyl	GCMSMS	57018-04-9
dichloorvos	GCMSMS	62-73-7	tolylfluanide	GCMSMS	731-27-1
diflufenican	GCMSMS	83164-33-4	tri-allaat	GCMSMS	2303-17-5
dimethenamid (-P)	GCMSMS	87674-68-8	triazamaat	GCMSMS	112143-82-5
dimethoaat	GCMSMS	60-51-5	trifloxystrobin	GCMSMS	141517-21-7
dodemorf-cis	GCMSMS	1593-77-7	vinclozolin	GCMSMS	50471-44-8
dodemorf-trans	GCMSMS	1593-77-7	emamectine (B1)	LCMSMS-ESI-POS	119791-41-2
abamectine	LCMSMS-ESI-POS	71751-41-2	emamectine (B2)	LCMSMS-ESI-POS	137335-79-6
aldicarb	LCMSMS-ESI-POS	116-06-3	etoxazole	LCMSMS-ESI-POS	153233-91-1
azaconazool	LCMSMS-ESI-POS	60207-31-0	ETU	LCMSMS-ESI-POS	96-45-7
azoxystrobin	LCMSMS-ESI-POS	131860-33-8	fenamidone	LCMSMS-ESI-POS	161326-34-7
bitertanol (som)	LCMSMS-ESI-POS	55179-31-2	flonicamid	LCMSMS-ESI-POS	158062-67-0
carbendazim	LCMSMS-ESI-POS	10605-21-7	fluazifop-P-butyl	LCMSMS-ESI-POS	79241-46-6
chloortoluron	LCMSMS-ESI-POS	15545-48-9	fluopicolide	LCMSMS-ESI-POS	239110-15-7
chloridazon	LCMSMS-ESI-POS	1698-60-8	fluopyram	LCMSMS-ESI-POS	658066-35-4
cyazofamid	LCMSMS-ESI-POS	120116-88-3	folpet	LCMSMS-ESI-POS	133-07-3
cycloxidim	LCMSMS-ESI-POS	101205-02-1	indoxacarb	LCMSMS-ESI-POS	173584-44-6
cymoxanil	LCMSMS-ESI-POS	57966-95-7	Jasmolin I	LCMSMS-ESI-POS	4466-14-2
cyproconazool (som)	LCMSMS-ESI-POS	94361-06-5	Jasmolin II	LCMSMS-ESI-POS	1172-63-0
difenoconazool (som)	LCMSMS-ESI-POS	119446-68-3	mandipropamid	LCMSMS-ESI-POS	374726-62-2
diflubenzuron	LCMSMS-ESI-POS	35367-38-5	mepanipyrim	LCMSMS-ESI-POS	110235-47-7
diuron	LCMSMS-ESI-POS	330-54-1	milbemectin A3	LCMSMS-ESI-POS	51596-10-2
dodine	LCMSMS-ESI-POS	2439-10-3	milbemectin A4	LCMSMS-ESI-POS	51596-11-3
fenarimol	LCMSMS-ESI-POS	60168-88-9	paclobutrazol	LCMSMS-ESI-POS	76738-62-0
fenbutatinoxide	LCMSMS-ESI-POS	13356-08-6	phorate	LCMSMS-ESI-POS	298-02-2
fenhexamid	LCMSMS-ESI-POS	126833-17-8	piperonylbutoxide	LCMSMS-ESI-POS	51-03-6

Compound	Method	Cas number	Compound	Method	Cas number
flutolanil	LCMSMS-ESI-POS	66332-96-5	propamocarb	LCMSMS-ESI-POS	24579-73-5
hexythiazox	LCMSMS-ESI-POS	78587-05-0	pyraclostrobin	LCMSMS-ESI-POS	175013-18-0
imazalil	LCMSMS-ESI-POS	35554-44-0	Pyrethrin I	LCMSMS-ESI-POS	121-21-1
imidacloprid	LCMSMS-ESI-POS	138261-41-3	Pyrethrin II	LCMSMS-ESI-POS	121-29-9
isoproturon	LCMSMS-ESI-POS	34123-59-6	pyridaben	LCMSMS-ESI-POS	96489-71-3
isoxaflutool	LCMSMS-ESI-POS	141112-29-0	pyridalyl	LCMSMS-ESI-POS	179101-81-6
lenacil	LCMSMS-ESI-POS	2164-08-1	pyriproxifen	LCMSMS-ESI-POS	95737-68-1
linuron	LCMSMS-ESI-POS	330-55-2	quinoclamine	LCMSMS-ESI-POS	2797-51-5
metabenzthiazuron	LCMSMS-ESI-POS	18691-97-9	quizalofop-P-ethyl	LCMSMS-ESI-POS	100646-51-3
metalaxyl	LCMSMS-ESI-POS	57837-19-1	spinosad A	LCMSMS-ESI-POS	168316-95-8
metamitron	LCMSMS-ESI-POS	41394-05-2	spinosad D	LCMSMS-ESI-POS	131929-60-7
methomyl	LCMSMS-ESI-POS	16752-77-5	spirodiclofen	LCMSMS-ESI-POS	148477-71-8
metobromuron	LCMSMS-ESI-POS	3060-89-7	spiromesifen	LCMSMS-ESI-POS	283594-90-1
metoxuron	LCMSMS-ESI-POS	19937-59-8	spirotetramat	LCMSMS-ESI-POS	203313-25-1
metsulfuron-methyl	LCMSMS-ESI-POS	74223-64-6	thiamethoxam	LCMSMS-ESI-POS	153719-23-4
monolinuron	LCMSMS-ESI-POS	1746-81-2	thiofanate-methyl	LCMSMS-ESI-POS	23564-05-8
monuron	LCMSMS-ESI-POS	150-68-5	spiromesifen	LCMSMS-ESI-POS	283594-90-1
nicosulfuron	LCMSMS-ESI-POS	111991-09-4	triflumizole	LCMSMS-ESI-POS	68694-11-1
oxamyl	LCMSMS-ESI-POS	23135-22-0	bixafen	LCMSMS-ESI-POS	581809-46-3
penconazool	LCMSMS-ESI-POS	66246-88-6	brodifacoum	LCMSMS-ESI-POS	56073-10-0
pencycuron	LCMSMS-ESI-POS	66063-05-6	chlorfenapyr	LCMSMS-ESI-POS	122453-73-0
desmedifam / fenmedifam	LCMSMS-ESI-POS	13684-56-5 / 13684-63-4	DMST	LCMSMS-ESI-POS	66840-71-9
prochloraz	LCMSMS-ESI-POS	67747-09-5	epoxiconazole	LCMSMS-ESI-POS	135319-73-2
propiconazool (som)	LCMSMS-ESI-POS	60207-90-1	flufenacet	LCMSMS-ESI-POS	142459-58-3
prosulfuron	LCMSMS-ESI-POS	94125-34-5	fluoxastrobin	LCMSMS-ESI-POS	361377-29-9
pymetrozine	LCMSMS-ESI-POS	123312-89-0	fluxapyroxad	LCMSMS-ESI-POS	907204-31-3
pyridaat	LCMSMS-ESI-POS	55512-33-9	isoprocarb	LCMSMS-ESI-POS	2631-40-5
rimsulfuron	LCMSMS-ESI-POS	122931-48-0	isopyrazam	LCMSMS-ESI-POS	881685-58-1
sulcotrion	LCMSMS-ESI-POS	2164-08-1	profenofos	LCMSMS-ESI-POS	41198-08-7

Compound	Method	Cas number	Compound	Method	Cas number
tebuconazool	LCMSMS-ESI-POS	107534-96-3	prothioconazole	LCMSMS-ESI-POS	178928-70-6
teflubenzuron	LCMSMS-ESI-POS	83121-18-0	fipronil	LCMSMS-ESI-NEG	120068-37-3
thiabendazol	LCMSMS-ESI-POS	148-79-8	fluazinam	LCMSMS-ESI-NEG	79622-59-6
thiacloprid	LCMSMS-ESI-POS	111988-49-9	flubendiamide	LCMSMS-ESI-NEG	272451-65-7
triadimenol	LCMSMS-ESI-POS	55219-65-3	fludioxonil	LCMSMS-ESI-NEG	131341-86-1
triasulfuron	LCMSMS-ESI-POS	82097-50-5	metoxyfenozide	LCMSMS-ESI-NEG	161050-58-4
tribenuron-methyl	LCMSMS-ESI-POS	101200-48-0	tepraloxydim	LCMSMS-ESI-NEG	149979-41-9
triflusulfuron-methyl	LCMSMS-ESI-POS	126535-15-7	2,4,5-T	LCMSMS-ESI-NEG	93-76-5
acequinocyl	LCMSMS-ESI-POS	57960-19-7	2,4,5-TP	LCMSMS-ESI-NEG	93-72-1
acetamiprid	LCMSMS-ESI-POS	135410-20-7	2,4-D	LCMSMS-ESI-NEG	94-75-7
ametoctradin	LCMSMS-ESI-POS	865318-97-4	2,4-DB	LCMSMS-ESI-NEG	94-82-6
azadirachtin	LCMSMS-ESI-POS	11141-17-6	2,4-DP	LCMSMS-ESI-NEG	120-36-5
benthiavalicarb isopropyl	LCMSMS-ESI-POS	177406-68-7	4-CPA	LCMSMS-ESI-NEG	122-88-3
bifenazate	LCMSMS-ESI-POS	149877-41-8	bentazon	LCMSMS-ESI-NEG	25057-89-0
boscalid	LCMSMS-ESI-POS	188425-85-6	bromoxynil	LCMSMS-ESI-NEG	1689-84-5
chlorantranilliprole	LCMSMS-ESI-POS	500008-45-7	clopyralid	LCMSMS-ESI-NEG	1702-17-6
chlormequat	LCMSMS-ESI-POS	999-81-5	dicamba	LCMSMS-ESI-NEG	1918-00-9
Cinerin I	LCMSMS-ESI-POS	25402-06-6	dinoterb	LCMSMS-ESI-NEG	1420-07-1
Cinerin II	LCMSMS-ESI-POS	121-20-0	fluroxypyr	LCMSMS-ESI-NEG	69377-81-7
clofentezine	LCMSMS-ESI-POS	74115-24-5	ioxynil	LCMSMS-ESI-NEG	1689-83-4
clothianidin	LCMSMS-ESI-POS	210880-92-5	MCPA	LCMSMS-ESI-NEG	94-74-6
cyflumetofen	LCMSMS-ESI-POS	400882-07-7	MCPB	LCMSMS-ESI-NEG	94-81-5
cyromazine	LCMSMS-ESI-POS	66215-27-8	MCPP	LCMSMS-ESI-NEG	93-65-2
daminozide	LCMSMS-ESI-POS	1596-84-5	triclopyr	LCMSMS-ESI-NEG	55335-06-3

C Measured concentrations

Tabel C.1 Measured concentration in **Drain 1, Drain 2** and **Ditch B** in **silicone rubber (SR).** Also water concentrations of grab samples of same positions as ditch samplers of May and October are included. Sub-numericals indicate sampling periods mentioned in Table 2.2; summer and autumn/winter period. < = below limit of detection, 0= measured in very low concentration and X = compound was present on sampler but due to poor uptake of the compound by SR the concentration is not reliable TWA= Time Weighted Average, time period in which the determined concentration is a time average concentration.

		Drain 1.1	Drain 1.2	Drain 1.3	Average TWA Drain 1	Drain 2.1	Drain 2.2	Drain 2.3	Average TWA Drain 2	May	Ditch B.2	Oct	Ditch B.3	Average TWA Ditch B
	Sampler	**SR**	**SR**	**SR**		**SR**	**SR**	**SR**		**Water**	**SR**	**Water**	**SR**	
Est. sampled volume in L		94	272	160		79	165	188			89		124	
Compound	**Cas number**	**ng/L**	**ng/L**	**ng/L**	**Days**	**ng/L**	**ng/L**	**ng/L**	**Days**	**ng/L**	**ng/L**	**ng/l**	**ng/l**	**Days**
naftaleen	91-20-3	3.4	1.7	1.2	4	0.6	3.9	1	5		3		7.6	5
acenaftyleen	208-96-8	0.7	0.6	0.07	8	2.5	0.9	0.08	9		0.2		0.9	9
acenafteen	83-32-9	0.4	2.1	0.2	18	0.1	3.3	0.1	21		1.7		4.5	21
fluoreen	86-73-7	0.6	1.4	0.3	27	0.3	5.2	0.2	33		1.9		3.5	32
fenantreen	85-01-8	0.8	1.4	0.2	52	0.4	9	0.4	63		2.1		4.4	46
antraceen	120-12-7	0.02	0.3	0.06	65	0.1	1.5	0.05	67		0.08		0.3	58
fluoranteen	206-44-0	0.3	0.4	0.2	All	0.2	1.5	0.2	All		1.2		2.5	All
pyreen	129-00-0	0.2	0.8	0.006	All	0.1	1.5	0.09	All		0.5		1.3	All
benzo(a)antraceen	56-55-3	0.07	0.004	0.009	All	0.05	0.02	0.01	All		0.02		0.05	All
chryseen	218-01-9	0.2	0.1	0.1	All	0.1	0.2	0.1	All		0.2		0.4	All
benzo(b)fluoranteen	205-99-2	0.05	0.02	0.04	All	0.05	0.04	0.05	All		0.06		0.1	All
benzo(k)fluoranteen	207-08-9	0.04	0.005	0.01	All	0.02	0.008	0.01	All		0.02		0.03	All
benzo(a)pyreen	50-32-8	0.02	<	0.01	All	0	0.009	0.009	All		<		0.02	All
indeno(123-cd)pyreen	139-39-5	0.01	<	<	All	0.01	<	<	All		0.007		0.01	All
dibenzo(ah)antraceen	53-70-3	0.01	<	<	All	<	<	<	All		<		<	All
benzo(ghi)peryleen	190-86-3	0.03	0.005	0.009	All	0.03	0.008	0.01	All		0.01		0.02	All
2-aminoacetophenon	551-93-9	-	23	<	0	-	16	<	0		12		<	0
aclonifen	74070-46-5	-	0.3	<	29	-	1.6	1.5	35		<		<	38

		Drain 1.1	Drain 1.2	Drain 1.3	Average TWA Drain 1	Drain 2.1	Drain 2.2	Drain 2.3	Average TWA Drain 2	May	Ditch B.2	Oct	Ditch B.3	Average TWA Ditch B
	Sampler	SR	SR	SR		SR	SR	SR		Water	SR	Water	SR	
	Est. sampled volume in L	94	272	160		79	165	188			89		124	
Compound	Cas number	ng/L	ng/L	ng/L	Days	ng/L	ng/L	ng/L	Days	ng/L	ng/L	ng/l	ng/l	Days
anthraquinone	84-65-1	-	1.7	0.4	10	-	1.3	0.4	12	<	1.2	<	5.1	13
atrazine	1912-24-9	-	<	<	1	-	0.9	0.8	1		<		<	1
atrazine-desethyl	6190-65-4	-	64	<	0	-	<	<	0		<		<	0
chloorprofam	101-21-3	-	9.6	32	6	-	11	30	7	<	19	<	32	7
cyprodinil	121552-61-2	-	<	<	49	-	<	<	59		0.2		<	65
DEET	134-62-3	-	2.9	<	3	-	1.5	1.3	3	<	4.3	<	3.1	4
diflufenican	83164-33-4	-	<	<	All	-	<	<	All	<	0.3	<	0.3	All
dimethenamid (-P)	87674-68-8	-	9.2	4.4	3	-	6	3	3	20	14	<	5.6	4
ethofumesaat	26225-79-6	-	1.5	1.9	5	-	2.8	13	6	<	2.8	<	3.8	7
fenamifos	22224-92-6	-	<	<	17	-	<	<	20		0.13		<	22
iprodion	36734-19-7	-	0.7	<	4	-	5.7	2.1	5		16		1	6
kresoxim-methyl	143390-89-0	-	<	<	20	-	<	<	24		1.2		<	26
metolachloor (-S)	51218-45-2	-	8.3	30	11	-	154	124	13	39	59	12	42	14
metribuzin	21087-64-9	-	<	<	0	-	37	132	0	<	<	<	23	0
pendimethalin	40487-42-1	-	0.3	1.2	All	-	3.3	3.2	All	<	0.7	<	1.5	All
pirimicarb	23103-98-2	-	22	3.4	1	-	29	17	1		126		24	1
propyzamide	23950-58-5	-	<	<	2	-	<	<	3		<		7.7	3
prosulfocarb	52888-80-9	-	0.1	<	All	-	0.85	0.3	All	<	1.5	9	3.9	All
simazine	122-34-9	-	<	<	1	-	<	<	1		2.5		4.2	1
terbutylazine	5915-41-3	-	<	<	6	-	0.29	0.4	7		0.8		<	8
terbutryn	886-50-0	-	<	<	26	-	<	<	32		0.2		<	35
tetramethrin-cis	7696-12-0	-	<	<	All	-	<	<	All		0.1		<	All
tolclofos-methyl	57018-04-9	-	<	<	66	-	<	<	All		<		0.07	All
tolylfluanide	731-27-1	-	0.03	<	65	-	0.07	0.2	79		0.09		<	57
tri-allaat	2303-17-5	-	<	<	All	-	<	0.06	All		0.1		1.1	All
trifloxystrobin	141517-21-7	-	<	0.3	All	-	0.2	0.15	All	<	0.3		<	All

		Drain 1.1	Drain 1.2	Drain 1.3	Average TWA Drain 1	Drain 2.1	Drain 2.2	Drain 2.3	Average TWA Drain 2	May	Ditch B.2	Oct	Ditch B.3	Average TWA Ditch B
	Sampler	SR	SR	SR		SR	SR	SR		Water	SR	Water	SR	
	Est. sampled volume in L	94	272	160		79	165	188			89		124	
Compound	**Cas number**	**ng/L**	**ng/L**	**ng/L**	**Days**	**ng/L**	**ng/L**	**ng/L**	**Days**	**ng/L**	**ng/L**	**ng/L**	**ng/L**	**Days**
azoxystrobin	131860-33-8	<	0.2	0.3	15	0.5	<	1.1	18	<	0.4	<	0.4	18
bitertanol (som)	55179-31-2	<	<	0.3	20	<	<	0.5	24		0.8		0.5	23
cyazofamid	120116-88-3	<	<	1.5	14	<	<	12	16		3.4		1.4	16
cyproconazool (som)	94361-06-5	<	0.8	1.1	5	2.1	0.7	8.6	6	<	3.4	<	3.2	6
difenoconazool (som)	119446-68-3	<	<	1.1	All	0.4	<	15	All		1.1		1.6	All
flutolanil	66332-96-5	<	<	<	7	1.1	2.5	0.38	8	<	1.0	<	0.3	8
isoproturon	34123-59-6	<	<	<	1	2.9	1.6	<	2	<	1.6	<	1.2	2
isoxaflutool	141112-29-0	0.4	<	<	8	0.4	<	<	10		<		<	10
linuron	330-55-2	1.1	7.8	7.7	4	0.4	1.4	129	5		12	<	30	5
metabenzthiazuron	18691-97-9	<	2.3	<	2	<	<	1.5	2		2.9		4.1	2
metalaxyl	57837-19-1	11	7.8	12	1	44	<	31	1		12	6	18	1
oxamyl	23135-22-0	<	6.7	<	1	<	15	<	1		<		<	1
penconazool	66246-88-6	1.8	<	<	58	12	<	<	70		<		<	51
pencycuron	66063-05-6	3	0.24	0.5	67	7.7	0.1	3.3	All	250	1.5	<	1.9	All
desmedifam / fenmedifam	13684-56-5 / 13684-63-4	3	<	0.7	12	9.4	<	0.7	14		0.3		0.6	14
prochloraz	67747-09-5	0.5	0.2	0.4	All	0.5	<	1.3	All		0.8		0.6	All
propiconazool (som)	60207-90-1	<	<	0.2	47	<	<	0.27	All	20	0.18	<	0.4	66
tebuconazool	107534-96-3	3.6	1.3	1.9	14	12	0.2	17	17	<	6.4	25	4.7	16
teflubenzuron	83121-18-0	<	<	<	54	<	<	<	66		<		0.2	48
acequinocyl	57960-19-7	<	<	<	All	<	<	<	All		0.03		<	All
boscalid	188425-85-6	3.4	2.1	3.9	26	14	0.4	8.8	31	<	29	<	14	30
chlormequat	999-81-5	1.1	<	<	27	0.8	<	<	33		<		<	32
cyflumetofen	400882-07-7	<	<	0.2	All	<	<	0.2	All		0.3		0.1	All
ETU	96-45-7	-	X	<	0	-	<	X	0		X		X	0
fluopicolide	239110-15-7	0.9	11	71	8	4.1	1.6	243	10	<	29	18	116	10
fluopyram	658066-35-4	1.1	0.4	6.2	49	21	0.3	48	60	11	8.9	9	16	66

		Drain 1.1	Drain 1.2	Drain 1.3	Average TWA Drain 1	Drain 2.1	Drain 2.2	Drain 2.3	Average TWA Drain 2	May	Ditch B.2	Oct	Ditch B.3	Average TWA Ditch B
	Sampler	**SR**	**SR**	**SR**		**SR**	**SR**	**SR**		**Water**	**SR**	**Water**	**SR**	
	Est. sampled volume in L	94	272	160		79	165	188			89		124	
Compound	**Cas number**	**ng/L**	**ng/L**	**ng/L**	**Days**	**ng/L**	**ng/L**	**ng/L**	**Days**	**ng/L**	**ng/L**	**ng/L**	**ng/L**	**Days**
mandipropamid	374726-62-2	<	3.4	3.6	21	0.1	<	33	25		5.9		6	24
mepanipyrim	110235-47-7	<	0.08	<	36	<	0.1	<	43		<		<	42
milbemectin A3	51596-10-2	<	<	<	All	<	0.05	<	All		0.05		<	All
milbemectin A4	51596-11-3	<	0.08	<	All	<	0.2	0.3	All		0.2		0.3	All
paclobutrazol	76738-62-0	<	<	<	11	<	<	0.8	13		0.3		0.6	13
piperonylbutoxide	51-03-6	<	<	<	All	<	<	<	All		0.06		<	All
propamocarb	24579-73-5	<	X	<	0	X	<	<	0		<		<	0
pyraclostrobin	175013-18-0	0.1	0.04	0.1	All	0.2	<	0.2	All		3.9		0.2	All
bixafen	581809-46-3	1.7	0.2	1.1	29	2.7	3	6.4	35		0.7		1.2	46
epoxiconazole	135319-73-2	4	1.3	2.3	21	4.3	3.5	8.9	25		4.7		3.9	All
flufenacet	142459-58-3	<	<	0.04	40	<	<	0.04	49	<	0.04	<	0.2	48
fluoxastrobin	361377-29-9	1.6	0.1	0.5	30	11	3.3	5	36		0.7		1.3	55
fluxapyroxad	907204-31-3	<	0.4	0.3	14	0.1	0.6	0.5	17	<	4.8	<	4.7	15
isopyrazam	881685-58-1	<	<	<	All	<	<	<	All		0.03		<	All
prothioconazole	178928-70-6	4.5	<	<	26	3.8	<	<	30	20	<	19	<	30
fipronil	120068-37-3	<	<	1.7	6	<	<	9.3	7	<	0.2	<	2.5	7
fluazinam	79622-59-6	<	<	<	All	<	0.04	0.02	All		<		<	All
flubendiamide	272451-65-7	<	<	<	18	0.1	0.27	0.4	21		0.3		0.2	20
fludioxonil	131341-86-1	<	<	<	4	<	<	<	5		0.5		0.3	5
metoxyfenozide	161050-58-4	<	<	<	9	0.8	0.9	0.8	11		1		0.8	10
MCPA	94-74-6	-	X	X	3	-	X	X	4		X		X	4

Tabel C.2 Measured concentration in **Drain 1, Drain 2 and Ditch B in Speedisk (SD).** Also water concentrations of grab samples of same positions as ditch samplers of May and October are included. Sub-numericals indicate sampling periods mentioned in Table 2.2; summer and autumn/winter period. < = below limit of detection. 0= measured in very low concentration. Concentrations are indicative.

		Drain 1.1	Drain 1.2	Drain 1.3	Drain 2.1	Drain 2.2	Drain 2.3	May	Ditch B.2	Oct	Ditch B.3
	Sampler	**SD**	**SD**	**SD**	**SD**	**SD**	**SD**	**Water**	**SD**	**Water**	**SD**
	Est. sampled volume in L	5.4	8	13	4.6	4	13		12		3
Compound	**Cas number**	**ng/L**	**ng/L**	**ng/L**	**ng/L**	**ng/L**	**ng/L**	**ng/L**	**ng/L**	**ng/l**	**ng/L**
naftaleen	91-20-3	3.8	11	2	4	11	24		9		26
acenaftyleen	208-96-8	3.3	0.9	0.1	3	2	<		<		4
acenafteen	83-32-9	0.5	5	0.5	0.4	5	0.5		2		8
fluoreen	86-73-7	0.5	5	0.2	0.6	6	0.2		3		4
fenantreen	85-01-8	0.9	4	0.5	1	10	0.5		4		5
antraceen	120-12-7	0.3	0.7	<	0.6	1	<		<		<
fluoranteen	206-44-0	0.3	0.5	0.2	0.2	2	0.2		1		2
pyreen	129-00-0	<	0.6	0.1	<	2	0.1		0.5		1
chryseen	218-01-9	<	<	0.1	<	0.3	<		0.2		0.5
benzo(b)fluoranteen	205-99-2	<	<	<	<	<	<		0.1		<
dibenzo(ah)antraceen	53-70-3	<	0.2	0.1	<	<	<		0.1		0.4
anthraquinone	84-65-1	-	0.9	<	-	1	<	<	0.9		2
chloorprofam	101-21-3	-	<	3	-	<	2		4	<	11
BAM	2008-58-4	-	4	9	-	23	39	57	23	39	48
dimethenamid (-P)	87674-68-8	-	<	<	-	<	<	20	2	<	<
metolachloor (-S)	51218-45-2	-	2	3	-	34	7	39	10	12	12
metribuzin	21087-64-9	-	<	<	-	27	23		1		6
pirimicarb	23103-98-2	-	0.8	<	-	2	0.4		5		2
procimidon	32809-16-8	-	2	2	-	8	2		4		10
trifloxystrobin	141517-21-7	-	<	<	-	5	2		<		<
azoxystrobin	131860-33-8	<	<	<	<	<	<	<	0.8		3
carbendazim	10605-21-7	<	<	<	<	<	<	<	0.5	<	<
chloortoluron	15545-48-9	<	2	<	3	11	3		4		9
cyazofamid	120116-88-3	<	<	<	<	7	1		<		<

		Drain 1.1	Drain 1.2	Drain 1.3	Drain 2.1	Drain 2.2	Drain 2.3	May	Ditch B.2	Oct	Ditch B.3
	Sampler	**SD**	**SD**	**SD**	**SD**	**SD**	**SD**	**Water**	**SD**	**Water**	**SD**
	Est. sampled volume in L	5.4	8	13	4.6	4	13		12		3
Compound	**Cas number**	**ng/L**	**ng/L**	**ng/L**	**ng/L**	**ng/L**	**ng/L**	**ng/L**	**ng/L**	**ng/L**	**ng/L**
difenoconazool (som)	119446-68-3	<	<	<	<	5	1		<		<
fenbutatinoxide	13356-08-6	<	<	<	<	<	<		1		<
imidacloprid	138261-41-3	<	2	<	<	5	2	<	2	<	4
linuron	330-55-2	<	0.9	<	<	15	8		0.9	<	3
metalaxyl	57837-19-1	<	<	0.6	3	8	2		1	6	3
metamitron	41394-05-2	<	0.7	<	<	<	1		<		3
oxamyl	23135-22-0	<	<	<	<	5	<		<		<
penconazool	66246-88-6	<	<	<	3	<	<		<		<
pencycuron	66063-05-6	2	<	<	11	<	<	250	<	<	<
desmedifam / fenmedifam	13684-56-5 / 13684-63-4	<	<	<	4	<	<		<		<
pymetrozine	123312-89-0	<	<	<	<	<	<		3		<
tebuconazool	107534-96-3	<	<	<	3	3	2		1		2
thiabendazol	148-79-8	1	<	<	<	<	<		<		<
boscalid	188425-85-6	1	1	0.9	3	15	5	<	21	<	9
chlormequat	999-81-5	<	<	<	3	<	<		<		<
clothianidin	210880-92-5	<	<	<	<	3	1		<		<
daminozide	1596-84-5	<	<	<	<	<	<		0.8		<
flonicamid	158062-67-0	<	<	<	<	<	<		10		<
fluopicolide	239110-15-7	<	5	11	<	68	126	<	8	18	79
fluopyram	658066-35-4	<	<	0.6	4	11	8	11	2	9	9
mandipropamid	374726-62-2	<	0.9	0.5	<	21	6		0.9		2
mepanipyrim	110235-47-7	<	<	0.6	<	2	<		<		<
milbemectin A3	51596-10-2	<	<	0.5	<	3	<		<		2
milbemectin A4	51596-11-3	<	<	<	<	3	0.8		4		9
propamocarb	24579-73-5	<	3	<	5	7	<		3		7
pyraclostrobin	175013-18-0	<	<	<	<	<	<		0.8		<

		Drain 1.1	Drain 1.2	Drain 1.3	Drain 2.1	Drain 2.2	Drain 2.3	May	Ditch B.2	Oct	Ditch B.3
	Sampler	**SD**	**SD**	**SD**	**SD**	**SD**	**SD**	**Water**	**SD**	**Water**	**SD**
	Est. sampled volume in L	5.4	8	13	4.6	4	13		12		3
Compound	**Cas number**	**ng/L**	**ng/L**	**ng/L**	**ng/L**	**ng/L**	**ng/L**	**ng/L**	**ng/L**	**ng/L**	**ng/L**
spirodiclofen	148477-71-8	<	<	<	2	<	<		<		<
bixafen	581809-46-3	<	<	<	<	2	1		0.5		<
chlorfenapyr	122453-73-0	-	<	<	-	<	<		0.4		<
epoxiconazole	135319-73-2	<	0.6	0.3	0.7	3	2	<	2	<	3
fluoxastrobin	361377-29-9	<	<	<	<	2	1		0.3	<	1
fluxapyroxad	907204-31-3	<	<	<	<	<	<		1	<	2
prothioconazole	178928-70-6	3	<	<	<	<	<	20	<	19	<
fipronil	120068-37-3	<	<	0.4	<	<	2	<	0.3	<	4
metoxyfenozide	161050-58-4	<	<	<	0.7	1	0.5	<	0.4	<	2
2,4,5-TP	93-72-1	-	<	<	-	<	<		<		0.8
bentazon	25057-89-0	-	5	3	-	25	4		4		16
fluroxypyr	69377-81-7	-	<	<	-	<	<		0.3		<
ioxynil	1689-83-4	-	0.5	<	-	0.8	<		<		<
MCPA	94-74-6	-	14	9	-	2	3		3		286
MCPP	93-65-2	-	0.6	<	-	<	<		1		0.8

Tabel C.3 Measured concentration in **Drain 3, Drain 4** and **Ditch D** in **silicone rubber (SR).** Also water concentrations of grab samples of same positions as ditch samplers of May and October are included. Sub-numericals indicate sampling periods mentioned in Table 2.2; summer and autumn/winter period. < = below limit of detection, 0= measured in very low concentration and X= compound was present of sampler but due to poor uptake of the compound by SR the concentration is not reliable TWA= Time Weighted Average, time period in which the determined concentration is a time average concentration.

		Drain 3.1	Drain 3.2	Drain 3.3	Average TWA Drain 3	Drain 4.1	Drain 4.2	Drain 4.3	Average TWA Drain 4	Ditch D.1	May	Ditch D.2	Oct	Ditch D.3	Average TWA Ditch D
	Sampler	SR	SR	SR		SR	SR	SR		SR	Water	SR	Water	SR	
est. sampled volume in L		52	386	52		42	77	49		195		2606		196	
Compound	Cas number	ng/L	ng/L	ng/L	Days	ng/L	ng/L	ng/L	Days	ng/L	ng/L	ng/L	ng/L	ng/L	Days
naftaleen	91-20-3	58	7.3	1.1	9	12	3.5	1.1	12	0.02		2.7		10	2
acenaftyleen	208-96-8	6.7	5.9	0.1	16	2.2	1.2	0.1	23	0.5		0.1		2.5	4
acenafteen	83-32-9	12	17	0.2	38	2.1	8.6	0.4	52	0.6		0.4		2.4	10
fluoreen	86-73-7	13	41	0.3	10	2.7	10	0.4	53	0.8		1		3.8	15
fenantreen	85-01-8	11	19	0.5	22	2.2	10	0.7	All	1.4		1.5		7.8	32
antraceen	120-12-7	1.2	4.7	0.1	28	0.3	2.3	0.1	All	0.03		0.02		0.4	41
fluoranteen	206-44-0	0.9	1.9	0.3	All	0.5	2.2	0.3	All	0.4		0.3		2.4	12
pyreen	129-00-0	0.9	0.1	0.2	All	0.5	2.4	0.3	All	0.3		0.1		1.2	13
benzo(a)antraceen	56-55-3	0.2	0.01	0.1	All	0.1	0.05	0.04	All	0.04		0.002		0.1	62
chryseen	218-01-9	0.4	0.1	0.4	All	0.3	0.3	0.2	All	0.2		0.02		0.3	53
benzo(b)fluoranteen	205-99-2	0.2	0.01	0.1	All	0.1	0.1	0.1	All	0.1		0.01		0.1	All
benzo(k)fluoranteen	207-08-9	0.1	0.005	0.0	All	0.1	0.02	0.03	All	0.04		0.001		0.02	All
benzo(a)pyreen	50-32-8	0.04	0.01	0.1	All	0.01	0.02	0.03	All	0.02		<		0.02	All
indeno(123-cd)pyreen	139-39-5	0.03	0.003	0.0	All	0.02	<	<	All	0.01		0.001		0.01	All
dibenzo(ah)antraceen	53-70-3	0.02	<	0.0	All	<	<	<	All	<		<		0.01	All
2-aminoacetophenon	551-93-9	-	102	<	0	-	30	<	1	-		22		21	0
aclonifen	74070-46-5	-	0.3	<	12	-	<	<	63	-		<		<	17
aldrin	309-00-2	-	<	<	28	-	0.7	1.8	All	-		<		<	38
anthraquinone	84-65-1	-	1.4	0.3	22	-	1	0.3	33	-	<	1	<	4.8	6
atrazine	1912-24-9	-	<	<	2	-	<	<	4	-		0.8		1.6	1
atrazine-desethyl	6190-65-4	-	170	<	0	-	32	<	0	-		<		<	0
chloorprofam	101-21-3	-	12	39	13	-	16	34	19	-	<	24	460	807	3
cyprodinil	121552-61-2	-	<	<	21	-	<	<	All	-		0.3		<	29

		Drain 3.1	Drain 3.2	Drain 3.3	Average TWA Drain 3	Drain 4.1	Drain 4.2	Drain 4.3	Average TWA Drain 4	Ditch D.1	May	Ditch D.2	Oct	Ditch D.3	Average TWA Ditch D
	Sampler	**SR**	**SR**	**SR**		**SR**	**SR**	**SR**		**SR**	**Water**	**SR**	**Water**	**SR**	
est. sampled volume in L		52	386	52		42	77	49		195		2606		196	
Compound	**Cas number**	**ng/L**	**ng/L**	**ng/L**	**Days**	**ng/L**	**ng/L**	**ng/L**	**Days**	**ng/L**	**ng/L**	**ng/L**	**ng/L**	**ng/L**	**Days**
DEET	134-62-3	-	2.6	<	6	-	1.3	<	9	-	<	25	17	87	2
diazinon	333-41-5	-	<	<	65	-	<	<	All	-		0.1		0.1	10
diflufenican	83164-33-4	-	<	3.2	All	-	9	2.6	All	-	<	1.9	<	4.3	20
dimethenamid (-P)	87674-68-8	-	2.4	<	6	-	9.1	1.5	9	-	23	2.8	<	24	2
dodemorf-cis	1593-77-7	-	<	<	13	-	<	<	19	-		0.6		<	3
ethofumesaat	26225-79-6	-	1.4	3.3	12	-	3.2	2.5	17	-	17	13	<	22	3
etridiazool	2593-15-9	-	<	<	20	-	<	<	30	-		<		0.4	5
fenpropimorf	67564-91-4	-	<	<	10	-	16	0.5	51	-	<	2.5		0.2	14
metolachloor (-S)	51218-45-2	-	2.2	3.3	24	-	24	7.8	36	-	150	15	13	29	6
metribuzin	21087-64-9	-	<	<	0	-	12.0	<	1	-	<	<		<	0
pendimethalin	40487-42-1	-	<	<	All	-	0.6	<	All	-	<	0.1		1.4	17
pirimicarb	23103-98-2	-	<	1.3	3	-	4.9	1.3	4	-		4.6		4.4	1
prosulfocarb	52888-80-9	-	0.3	<	All	-	0.5	<	All	-	16	0.3	12	8.8	14
simazine	122-34-9	-	4	<	1	-	<	<	2	-		5.8	9	113	0
terbutylazine	5915-41-3	-	<	<	13	-	<	<	20	-		1.0		0.4	3
terbutryn	886-50-0	-	<	<	11	-	<	<	58	-		0.3		1.7	16
tolclofos-methyl	57018-04-9	-	<	<	45	-	<	<	All	-		0.04		0.1	7
tolylfluanide	731-27-1	-	<	<	28	-	0.3	0.2	All	-		0.04		<	38
tri-allaat	2303-17-5	-	<	<	All	-	<	<	All	-		0.1		2	16
trifloxystrobin	141517-21-7	-	<	<	All	-	0.4	<	All	-		0.1		1.0	23
azoxystrobin	131860-33-8	<	<	<	32	<	0.2	<	44	1.4	<	0.9		0.6	8
bitertanol (som)	55179-31-2	<	<	0.4	42	<	0.3	0.4	59	<		1.5		0.9	11
carbendazim	10605-21-7	<	<	<	1	<	<	<	1	29	23	6.7	<	<	0
cycloxidim	101205-02-1	<	<	<	20	<	<	<	28	<		0.4		0.6	5
cyproconazool (som)	94361-06-5	<	0.8	<	10	<	1.7	1.1	14	6.2	<	11	21	64	3
difenoconazool (som)	119446-68-3	0.3	<	<	All	<	0.3	<	All	0.1		0.2	<	1.7	27
diuron	330-54-1	<	<	<	2	<	<	<	2	<	<	<	17	17	0

		Drain 3.1	Drain 3.2	Drain 3.3	Average TWA Drain 3	Drain 4.1	Drain 4.2	Drain 4.3	Average TWA Drain 4	Ditch D.1	May	Ditch D.2	Oct	Ditch D.3	Average TWA Ditch D
	Sampler	SR	SR	SR		SR	SR	SR		SR	Water	SR	Water	SR	
est. sampled volume in L		52	386	52		42	77	49		195		2606		196	
Compound	**Cas number**	**ng/L**	**ng/L**	**ng/L**	**Days**	**ng/L**	**ng/L**	**ng/L**	**Days**	**ng/L**	**ng/L**	**ng/L**	**ng/L**	**ng/L**	**Days**
fenarimol	60168-88-9	<	<	<	24	<	<	<	33	0.2		0.9		0.9	6
fenhexamid	126833-17-8	<	<	15	1	<	<	15	2	<		<		2.8	0
flutolanil	66332-96-5	0.9	2.4	0.3	15	1.0	2	<	20	1.5	26	162	14	46	4
isoproturon	34123-59-6	5.7	1.3	1.3	3	3.9	7.9	1.9	4	117	<	15	<	19	0.72
isoxaflutool	141112-29-0	<	<	<	17	0.4	11	<	24	0.7		<		<	4
lenacil	2164-08-1	<	<	<	1	<	<	<	2	4.5		25		<	0
linuron	330-55-2	1.1	1.3	<	9	2.0	1.4	<	12	3.4		9.1	<	8	2
metabenzthiazuron	18691-97-9	<	<	<	4	<	1.7	2.2	6	3.4		2.8		6.8	1
metalaxyl	57837-19-1	3.9	<	13	2	<	5.4	7	3	3.3		6.4	<	7.9	1
metamitron	41394-05-2	<	<	<	0	82	<	<	0	107	<	<		<	0
oxamyl	23135-22-0	<	<	10	1	<	<	<	2	<		<		<	0
penconazool	66246-88-6	0.6	<	<	25	9	<	<	All	11		<		<	36
pencycuron	66063-05-6	6.1	0.1	1.5	46	9.1	3.9	1.4	All	6.1	240	8.6	<	7.3	7
desmedifam / fenmedifam	13684-56-5 / 13684-63-4	6.9	<	4.1	25	8.3	0.6	2.4	35	5.5		<		0.6	6
prochloraz	67747-09-5	<	<	<	All	<	<	<	All	0.2		0.04		0.1	26
propiconazool (som)	60207-90-1	<	<	0.9	32	<	0.4	0.7	All	0.6		3	<	2.8	46
tebuconazool	107534-96-3	2.6	0.2	0.5	29	2.9	1.2	0.4	41	11	5	7.3	<	3.9	8
triadimenol	55219-65-3	<	<	<	4	<	<	<	5	<		2.2		2.4	1
acequinocyl	57960-19-7	<	<	<	All	<	<	<	All	<		0.02		<	12
boscalid	188425-85-6	4.1	0.3	4.9	10	2.9	5.9	4.2	50	4.6	15	3.1	<	5.4	14
chlormequat	999-81-5	1.6	<	<	10	2.9	<	<	53	2		<		<	15
Cinerin II	121-20-0	<	<	<	All	<	<	<	All	0.3		<		<	All
cyflumetofen	400882-07-7	<	0.02	0.4	All	<	0.1	0.1	All	<		0.05		0.2	39
ETU	96-45-7	-	<	<	0	-	X	<	0	-		<		X	0
fluopicolide	239110-15-7	62.0	1.3	28	17	33	48	35	24	49	30	16	17	23	4
fluopyram	658066-35-4	<	0.2	0.4	21	<	0.9	0.8	All	1.1	<	6.7	<	2.7	31

		Drain 3.1	Drain 3.2	Drain 3.3	Average TWA Drain 3	Drain 4.1	Drain 4.2	Drain 4.3	Average TWA Drain 4	Ditch D.1	May	Ditch D.2	Oct	Ditch D.3	Average TWA Ditch D
	Sampler	SR	SR	SR		SR	SR	SR		SR	Water	SR	Water	SR	
est. sampled volume in L		52	386	52		42	77	49		195		2606		196	
Compound	**Cas number**	**ng/L**	**ng/L**	**ng/L**	**Days**	**ng/L**	**ng/L**	**ng/L**	**Days**	**ng/L**	**ng/L**	**ng/L**	**ng/L**	**ng/L**	**Days**
mandipropamid	374726-62-2	0.3	<	<	44	0.2	0.5	<	63	0.1		0.6		0.3	12
mepanipyrim	110235-47-7	<	0.1	<	14	<	0.1	0.4	All	<		0.1		<	20
milbemectin A3	51596-10-2	<	0.0	0.2	All	<	0.2	<	All	<		<		0.2	17
milbemectin A4	51596-11-3	<	0.1	<	All	<	0.4	0.6	All	<		0.1		0.1	16
piperonylbutoxide	51-03-6	<	<	<	All	<	<	<	All	<		0.03		0.1	36
pyraclostrobin	175013-18-0	<	<	<	All	<	<	<	All	<		0.3		0.5	22
Pyrethrin I	121-21-1	<	<	<	All	<	<	<	All	<		<		1.1	20
pyridalyl	179101-81-6	<	<	<	30	0.2	<	<	All	0.1		<		<	44
bixafen	581809-46-3	0.3	0.4	1.4	23	0.6	7.4	2.6	39	3.4		9	<	3.2	16
chlorfenapyr	122453-73-0	-	<	<	All	-	<	<	All	-		<		0.5	All
DMST	66840-71-9	<	9.4	<	0	<	<	<	0	<		<		11	0
epoxiconazole	135319-73-2	17	0.2	6.4	47	14	14	6.4	48	36	<	5.2	<	6.8	9
flufenacet	142459-58-3	10	0.02	0.3	23	50.0	1.8	0.5	29	57	11	0.9	<	1.6	23
fluoxastrobin	361377-29-9	0.9	<	0.3	15	0.9	0.5	0.3	15	4		0.5		0.5	18
fluxapyroxad	907204-31-3	1.9	0.3	3.9	30	1.2	6.2	4	41	1.9	<	2.7	<	2.6	8
isopyrazam	881685-58-1	<	<	<	57	<	<	<	All	0.03		0.05		0.2	9
prothioconazole	178928-70-6	1.8	<	<	10	12	<	<	49	20	25	<	16	<	14
fipronil	120068-37-3	<	<	0.7	13	<	<	0.5	18	0.3		<	<	0.7	3
fluazinam	79622-59-6	<	<	<	All	<	<	<	All	<		0.1		<	15
flubendiamide	272451-65-7	<	<	<	37	<	<	<	52	<		0.1		<	10
fludioxonil	131341-86-1	<	<	<	9	<	<	<	13	<		4		4.2	2
metoxyfenozide	161050-58-4	<	<	<	19	<	<	<	26	2.1	<	0.8	<	0.3	5
2,4,5-TP	93-72-1	-	<	<	13	-	<	<	68	-		<		0.04	19
fluroxypyr	69377-81-7	-	<	<	0	-	<	<	0	-		10		<	0
ioxynil	1689-83-4	-	<	<	1	-	<	<	1	-		<		5.5	0
MCPA	94-74-6	-	X	X	8	-	X	X	11	-		X		X	2
triclopyr	55335-06-3	-	<	<	4	-	<	<	6	-		<		0.5	1

Tabel C.4 Measured concentration in **Drain 3, Drain 4 and Ditch D in Speedisk (SD).** Also water concentrations of grab samples of same positions as ditch samplers of May and October are included.Sub-numericals indicate sampling periods mentioned in Table 2.2; summer and autumn/winter period. < = below limit of detection. Concentrations are indicative.

		Drain 3.1	Drain 3.2	Drain 3.3	Drain 4.1	Drain 4.2	Drain 4.3	Ditch D.1	May	Ditch D.2	Oct	Ditch D.3
	Sampler	**SD**	**SD**	**SD**	**SD**	**SD**	**SD**	**SD**	**Water**	**SD**	**Water**	**SD**
Est. sampled volume in L		2.6	2.5	7.4	7.8	1.7	6.3	10.3		30		3.2
Compound	**Cas number**	**ng/L**	**ng/L**	**ng/L**	**ng/L**	**ng/L**	**ng/L**	**ng/L**	**ng/L**	**ng/L**	**ng/L**	**ng/L**
naftaleen	91-20-3	58	144	4	7	28	7	8		3		24
acenaftyleen	208-96-8	10	10	<	8	2	0.4	4		0.1		2
acenafteen	83-32-9	8	36	2	1	27	2	1		0.5		5
fluoreen	86-73-7	7	32	0.3	1	18	1	1		1		4
fenantreen	85-01-8	8	24	1	1	14	2	1		1		7
antraceen	120-12-7	1	4	<	0.2	2	0.2	1		0.1		1
fluoranteen	206-44-0	1	2	0.3	0.5	2	0.3	1		0.2		2
pyreen	129-00-0	1	<	0.2	0.5	2	0.3	0.2		0.1		1
benzo(a)antraceen	56-55-3	<	<	<	0.2	<	<	0.1		<		<
chryseen	218-01-9	1	1	<	0.4	<	<	0.2		0.1		0.5
benzo(b)fluoranteen	205-99-2	<	<	<	0.3	<	<	0.1		0.04		<
benzo(k)fluoranteen	207-08-9	<	<	<	0.2	<	<	0.1		<		<
benzo(a)pyreen	50-32-8	<	<	<	0.2	<	<	<		<		<
indeno(123-cd)pyreen	139-39-5	0.5	<	<	0.2	<	<	<		<		<
dibenzo(ah)antraceen	53-70-3	<	1	<	0.1	<	<	0.1		0.04		0.4
benzo(ghi)peryleen	190-86-3	<	<	<	0.2	<	<	0.1		<		<
anthraquinone	84-65-1	-	2	<	-	<	<	-	<	0.3	<	3
chloorprofam	101-21-3	-	<	10	-	20	7	-	<	3	460	753
DEET	134-62-3	-	<	<	-	<	<	-	<	2	17	25
BAM	2008-58-4	-	<	24	-	87	17	-	12	3	15	22
dimethenamid (-P)	87674-68-8	-	<	<	-	<	<	-	23	0.5	<	3
esfenvaleraat (fenvaleraat-alfa)	66230-04-4	-	<	<	-	<	4	-		<		<
ethofumesaat	26225-79-6	-	<	<	-	<	<	-	17	3	<	6
fenpropimorf	67564-91-4	-	<	<	-	12	<	-	<	<		<

		Drain 3.1	Drain 3.2	Drain 3.3	Drain 4.1	Drain 4.2	Drain 4.3	Ditch D.1	May	Ditch D.2	Oct	Ditch D.3
	Sampler	**SD**	**SD**	**SD**	**SD**	**SD**	**SD**	**SD**	**Water**	**SD**	**Water**	**SD**
Est. sampled volume in L		2.6	2.5	7.4	7.8	1.7	6.3	10.3		30		3.2
Compound	**Cas number**	**ng/L**	**ng/L**	**ng/L**	**ng/L**	**ng/L**	**ng/L**	**ng/L**	**ng/L**	**ng/L**	**ng/L**	**ng/L**
metolachloor (-S)	51218-45-2	-	3	<	-	12	1	-	150	2	13	10
metribuzin	21087-64-9	-	<	<	-	7	<	-	<	0.4		<
pirimicarb	23103-98-2	-	<	<	-	<	<	-		0.1		<
procimidon	32809-16-8	-	5	2	-	12	<	-		1		11
prosulfocarb	52888-80-9	-	<	<	-	<	<	-	16	<	12	7
simazine	122-34-9	-	<	<	-	<	<	-		<		17
terbutryn	886-50-0	-	<	<	-	<	<	-		<		3
trifloxystrobin	141517-21-7	-	<	<	-	<	<	-		<		10
azoxystrobin	131860-33-8	<	<	<	<	<	<	<	<	<		13
carbendazim	10605-21-7	<	<	<	2	<	<	20	23	1	<	4
chloortoluron	15545-48-9	5	<	2	<	8	<	8		2		8
cyproconazool (som)	94361-06-5	<	<	<	<	<	<	<	<	0.5	21	22
diuron	330-54-1	<	<	<	<	<	<	<		<		2
fenbutatinoxide	13356-08-6	<	<	<	<	<	<	<		0.4		<
flutolanil	66332-96-5	<	3	<	<	<	<	<	26	8	14	11
imidacloprid	138261-41-3	<	<	<	<	14	<	2	<	1	<	11
isoproturon	34123-59-6	<	<	<	<	<	<	7	<	1	<	3
lenacil	2164-08-1	<	<	<	<	<	<	<		0.4		<
linuron	330-55-2	<	<	<	<	<	<	<		1	<	<
metalaxyl	57837-19-1	<	<	<	<	<	<	<		0	<	<
metamitron	41394-05-2	<	<	<	<	<	<	<	<	0		<
oxamyl	23135-22-0	<	<	7	<	<	<	<		3		7
penconazool	66246-88-6	<	<	<	12	<	<	9		<		<
pencycuron	66063-05-6	<	<	<	<	<	<	2	240	1	<	5
propiconazool (som)	60207-90-1	<	<	<	<	<	<	<		0.4	<	3
tebuconazool	107534-96-3	<	<	<	<	<	<	1	5	1	<	3
thiabendazol	148-79-8	<	<	<	<	<	<	<		<		4

		Drain 3.1	Drain 3.2	Drain 3.3	Drain 4.1	Drain 4.2	Drain 4.3	Ditch D.1	May	Ditch D.2	Oct	Ditch D.3
	Sampler	**SD**	**SD**	**SD**	**SD**	**SD**	**SD**	**SD**	**Water**	**SD**	**Water**	**SD**
Est. sampled volume in L		2.6	2.5	7.4	7.8	1.7	6.3	10.3		30		3.2
Compound	**Cas number**	**ng/L**	**ng/L**	**ng/L**	**ng/L**	**ng/L**	**ng/L**	**ng/L**	**ng/L**	**ng/L**	**ng/L**	**ng/L**
boscalid	188425-85-6	3	<	1	1	12	1	2	15	1	<	8
chlormequat	999-81-5	8	<	<	<	<	<	<		<		<
clothianidin	210880-92-5	<	<	<	<	7	<	<		0.2		<
daminozide	1596-84-5	<	5	<	<	<	1	<		0.3		6
ETU	96-45-7	-	<	<	-	<	<	-		<		2
flonicamid	158062-67-0	<	<	<	<	<	<	<		0		<
fluopicolide	239110-15-7	19	7	3	4	52	5	7	30	4	17	19
fluopyram	658066-35-4	<	<	<	<	<	<	<	<	1	<	2
mepanipyrim	110235-47-7	<	<	<	<	5	<	<		0.2		<
milbemectin A3	51596-10-2	<	<	<	<	<	2	<		0.3		<
milbemectin A4	51596-11-3	<	<	<	<	20	<	<		0.4		20
propamocarb	24579-73-5	<	<	<	1	6	<	1		0.3		2
pyridalyl	179101-81-6	<	<	<	1	<	<	1		<		<
quinoclamine	2797-51-5	<	<	<	<	<	<	<		<		2
bixafen	581809-46-3	<	2	1	<	8	<	0.5		1	<	2
chlorfenapyr	122453-73-0	-	<	1	-	<	<	-		0.1		3
DMST	66840-71-9	<	<	1	<	6	<	<		<		3
epoxiconazole	135319-73-2	5	3	1	2	14	1	3	<	1	<	7
flufenacet	142459-58-3	<	<	<	30	<	<	5		0.1		1
fluxapyroxad	907204-31-3	1	<	<	0.5	4	1	1	<	0.3	<	2
prothioconazole	178928-70-6	9	<	<	3	<	<	<	25	<	16	<
fipronil	120068-37-3	<	<	<	<	<	<	<		<	<	1
fludioxonil	131341-86-1	<	<	<	<	<	<	<		1		3
metoxyfenozide	161050-58-4	<	<	<	<	<	<	1	<	0.5	<	1
2,4-D	94-75-7	-	<	<	-	<	<	-		0.1		24
bentazon	25057-89-0	-	1	3	-	39	6	-		3		18
fluroxypyr	69377-81-7	-	<	<	-	<	<	-		0.1		1

		Drain 3.1	Drain 3.2	Drain 3.3	Drain 4.1	Drain 4.2	Drain 4.3	Ditch D.1	May	Ditch D.2	Oct	Ditch D.3
	Sampler	**SD**	**SD**	**SD**	**SD**	**SD**	**SD**	**SD**	**Water**	**SD**	**Water**	**SD**
Est. sampled volume in L		2.6	2.5	7.4	7.8	1.7	6.3	10.3		30		3.2
Compound	**Cas number**	**ng/L**	**ng/L**	**ng/L**	**ng/L**	**ng/L**	**ng/L**	**ng/L**	**ng/L**	**ng/L**	**ng/L**	**ng/L**
MCPA	94-74-6	-	14	2	-	943	1	-		29		94
MCPP	93-65-2	-	<	<	-	2	<	-		1		8

Tabel C.5 Measured concentration in the **canal** in **silicone rubber (SR).** Sub-numericals indicate sampling periods mentioned in Table 2.2; summer and autumn/winter period. < = below limit of detection, 0= measured in very low concentration and X = compound was present on sampler but due to poor uptake of the compound by SR the concentration is not reliable TWA= Time Weighted Average, time period in which the determined concentration is a time average concentration.

		Canal 1.2	Canal 1.3	Average TWA Canal
	Sampler	**SR**	**SR**	
	est. sampled volume in L	564	245	
Compound	**Cas number**	**ng/L**	**ng/L**	**Days**
naftaleen	91-20-3	1.2	8.8	2
acenaftyleen	208-96-8	0.1	1.2	4
acenafteen	83-32-9	0.3	2.2	9
fluoreen	86-73-7	0.6	2.9	15
fenantreen	85-01-8	0.7	6	31
antraceen	120-12-7	0.01	0.3	39
fluoranteen	206-44-0	0.4	2.2	53
pyreen	129-00-0	0.1	0.9	61
benzo(a)antraceen	56-55-3	0.01	0	All
chryseen	218-01-9	0.1	0.3	All
benzo(b)fluoranteen	205-99-2	0.04	0.1	All
benzo(k)fluoranteen	207-08-9	0.01	0	All
benzo(a)pyreen	50-32-8	0.003	0	All
indeno(123-cd)pyreen	139-39-5	0.005	0	All
benzo(ghi)peryleen	190-86-3	0.01	0	All
anthraquinone	84-65-1	1.1	0.7	6
chloorprofam	101-21-3	8.4	11	3
clomazon	81777-89-1	0.7	<	2
cyprodinil	121552-61-2	0.2	<	29
DEET	134-62-3	12	1.2	2
diazinon	333-41-5	0.1	<	45
diflufenican	83164-33-4	0.6	<	All
dimethenamid (-P)	87674-68-8	6.7	2.2	2
ethofumesaat	26225-79-6	8.4	<	3
fenamifos	22224-92-6	0.3	<	10
iprodion	36734-19-7	6.1	<	3
kresoxim-methyl	143390-89-0	0.4	<	12
metolachloor (-S)	51218-45-2	22	5.5	6
pendimethalin	40487-42-1	0.1	0.3	All
pirimicarb	23103-98-2	59	1.4	1
propyzamide	23950-58-5	4.1	<	1
prosulfocarb	52888-80-9	0.4	0.7	65
simazine	122-34-9	2.9	<	0
terbutylazine	5915-41-3	4.9	<	3
terbutryn	886-50-0	1.1	<	16
tolclofos-methyl	57018-04-9	0.02	<	31
tolylfluanide	731-27-1	0.1	<	39
tri-allaat	2303-17-5	0.05	0.2	All
trifloxystrobin	141517-21-7	0.2	<	All
azoxystrobin	131860-33-8	0.7	0.4	8

		Canal 1.2	Canal 1.3	Average TWA Canal
	Sampler	**SR**	**SR**	
	est. sampled volume in L	564	245	
Compound	**Cas number**	**ng/L**	**ng/L**	**Days**
bitertanol (som)	55179-31-2	<	1.1	10
carbendazim	10605-21-7	8.5	5.7	0
cyazofamid	120116-88-3	0.3	0.3	7
cyproconazool (som)	94361-06-5	3.9	8.9	3
difenoconazool (som)	119446-68-3	0.6	0.4	All
flutolanil	66332-96-5	15	6.1	4
isoproturon	34123-59-6	4.5	8.5	1
lenacil	2164-08-1	19	<	0
linuron	330-55-2	1.8	8.2	2
metabenzthiazuron	18691-97-9	2.0	2.6	1
metalaxyl	57837-19-1	8.2	11	1
oxamyl	23135-22-0	10	11	0
pencycuron	66063-05-6	0.9	1.2	32
desmedifam / fenmedifam	13684-56-5 / 13684-63-4	0.4	0.3	6
prochloraz	67747-09-5	0.3	0.2	All
propiconazool (som)	60207-90-1	0.8	0.6	45
tebuconazool	107534-96-3	6.8	2.7	7
ametoctradin	865318-97-4	0.1	<	23
boscalid	188425-85-6	17	7.4	14
Cinerin II	121-20-0	0.02	0	All
cyflumetofen	400882-07-7	0.04	0.1	All
ETU	96-45-7	<	X	0
fluopicolide	239110-15-7	41	43	4
fluopyram	658066-35-4	11	7.2	30
mandipropamid	374726-62-2	5.2	7	11
mepanipyrim	110235-47-7	0.1	<	19
milbemectin A3	51596-10-2	<	0.1	All
milbemectin A4	51596-11-3	0.4	0.1	All
paclobutrazol	76738-62-0	<	0.2	6
piperonylbutoxide	51-03-6	0.02	0	All
propamocarb	*24579-73-5*	X	<	0
pyraclostrobin	175013-18-0	2.1	0.2	All
pyridalyl	179101-81-6	<	0.1	43
bixafen	581809-46-3	1.7	1.3	21
epoxiconazole	135319-73-2	3.1	2.6	38
flufenacet	142459-58-3	0.03	0.7	33
fluoxastrobin	361377-29-9	1.0	0.4	25
fluxapyroxad	907204-31-3	5.1	3.7	7
isopyrazam	881685-58-1	0.1	0.3	39
fipronil	120068-37-3	<	1.8	3
fluazinam	79622-59-6	0.0	<	All
flubendiamide	272451-65-7	0.3	0.1	9
fludioxonil	131341-86-1	0.3	0.6	2
metoxyfenozide	161050-58-4	1.2	0.5	5

		Canal 1.2	Canal 1.3	Average TWA Canal
	Sampler	**SR**	**SR**	
	est. sampled volume in L	564	245	
Compound	**Cas number**	**ng/L**	**ng/L**	**Days**
MCPA	94-74-6	X	X	2

Tabel C.6 Measured concentration in the **Canal** in **Speedisk (SD).** Sub-numericals indicate sampling periods mentioned in Table 2.2; summer and autumn/winter period. < = below limit of detection. 0= measured in very low concentration. Concentrations are indicative.

		Canal 1.2	Canal 1.3
	Sampler	**SD**	**SD**
	Est. sampled volume in L	13.7	4
Compound	**Cas number**	**ng/L**	**ng/L**
naftaleen	91-20-3	4	16
acenaftyleen	208-96-8	<	1
acenafteen	83-32-9	1	4
fluoreen	86-73-7	0.4	4
fenantreen	85-01-8	1	5
antraceen	120-12-7	<	0
fluoranteen	206-44-0	0.3	2
pyreen	129-00-0	0.2	1
chryseen	218-01-9	0.1	0.3
benzo(b)fluoranteen	205-99-2	0.1	<
dibenzo(ah)antraceen	53-70-3	0.1	0
chloorprofam	101-21-3	4	9
DEET	134-62-3	1	<
BAM	2008-58-4	9	<
dimethenamid (-P)	87674-68-8	2	<
ethofumesaat	26225-79-6	2	<
iprodion	36734-19-7	1	<
metolachloor (-S)	51218-45-2	4	<
metribuzin	21087-64-9	1	<
pirimicarb	23103-98-2	2	<
procimidon	32809-16-8	6	<
terbutylazine	5915-41-3	0.3	<
trifloxystrobin	141517-21-7	2	<
azoxystrobin	131860-33-8	1	9
bitertanol (som)	55179-31-2	<	5
carbendazim	10605-21-7	1	2
chloortoluron	15545-48-9	3	6
cyproconazool (som)	94361-06-5	<	3
fenbutatinoxide	13356-08-6	1	<
flutolanil	66332-96-5	1	<
imidacloprid	138261-41-3	1	3
metalaxyl	57837-19-1	1	2
oxamyl	23135-22-0	2	4
pymetrozine	123312-89-0	1	<
tebuconazool	107534-96-3	1	<
thiabendazol	148-79-8	<	6
boscalid	188425-85-6	17	24
cyflumetofen	400882-07-7	<	2
daminozide	1596-84-5	<	2
flonicamid	158062-67-0	8	2
fluopicolide	239110-15-7	14	30

		Canal 1.2	Canal 1.3
	Sampler	**SD**	**SD**
	Est. sampled volume in L	13.7	4
Compound	**Cas number**	**ng/L**	**ng/L**
fluopyram	658066-35-4	3	4
mandipropamid	374726-62-2	1	4
milbemectin A3	51596-10-2	0.4	<
milbemectin A4	51596-11-3	2	12
propamocarb	24579-73-5	0.4	<
pyraclostrobin	175013-18-0	1	<
pyridalyl	179101-81-6	<	5
bixafen	581809-46-3	0	2
epoxiconazole	135319-73-2	1	2
fluoxastrobin	361377-29-9	0.4	<
fluxapyroxad	907204-31-3	1	1
fipronil	120068-37-3	<	1
metoxyfenozide	161050-58-4	1	1
2,4-D	94-75-7	<	1
4-CPA	122-88-3	<	0
bentazon	25057-89-0	8	34
fluroxypyr	69377-81-7	<	1
ioxynil	1689-83-4	0.4	<
MCPA	94-74-6	2	505
MCPB	94-81-5	<	<
MCPP	93-65-2	1	4

Tabel C.7 Measured concentration in the **Yard Drain** in **silicone rubber (SR).** Sub-numericals indicate sampling periods mentioned in Table 2.2; summer and autumn/winter period. < = below limit of detection, 0= measured in very low concentration and X = compound was present on sampler but due to poor uptake of the compound by SR the concentration is not reliable TWA= Time Weighted Average, time period in which the determined concentration is a time average concentration.

		Drain Yard 1	Drain Yard 2	Drain Yard 3	Average TWA Yard
	Sampler	**SR**	**SR**	**SR**	
	Est. sampled volume in L	89	128	51	
Compound	**Cas number**	**ng/L**	**ng/L**	**ng/L**	**Days**
naftaleen	91-20-3	20	16	5.5	9
acenaftyleen	208-96-8	0.9	2.9	0.8	16
acenafteen	83-32-9	1.6	8.2	3.9	36
fluoreen	86-73-7	3.2	21	8.6	34
fenantreen	85-01-8	5.6	35	11	69
antraceen	120-12-7	0.5	3.6	1.3	All
fluoranteen	206-44-0	2.4	7.4	3.8	All
pyreen	129-00-0	1.2	4.3	2.5	All
benzo(a)antraceen	56-55-3	0.1	0.2	0.2	All
chryseen	218-01-9	0.6	0.8	0.9	All
benzo(b)fluoranteen	205-99-2	0.1	0.2	0.3	All
benzo(k)fluoranteen	207-08-9	0.1	0.1	0.1	All
benzo(a)pyreen	50-32-8	0.04	0.05	0.1	All
indeno(123-cd)pyreen	139-39-5	0.02	0.02	0.03	All
dibenzo(ah)antraceen	53-70-3	<	0.01	<	All
benzo(ghi)peryleen	190-86-3	0.03	0.03	0.1	All
2-aminoacetophenon	551-93-9	22	40	<	0
anthraquinone	84-65-1	0.6	1.8	1.3	23
atrazine	1912-24-9	<	1.1	1.8	2
atrazine-desethyl	6190-65-4	<	37	<	0
chloorprofam	101-21-3	5640	1560	1740	13
clomazon	81777-89-1	2.1	1.8	5.5	9
cyprodinil	121552-61-2	0.9	1.5	0.9	65
DEET	134-62-3	15	21	26	7
dichlobenil	1194-65-6	2.8	3	2.5	6
BAM	2008-58-4	53	<	137	0
diflufenican	83164-33-4	4.2	0.5	1.7	All
dimethenamid (-P)	87674-68-8	4960	3990	1830	6
dodemorf-cis	1593-77-7	<	0.6	<	13
esfenvaleraat (fenvaleraat-alfa)	66230-04-4	0.2	<	<	All
ethofumesaat	26225-79-6	292	351	557	12
fenamifos	22224-92-6	<	<	0.2	39
fenpropimorf	67564-91-4	0.7	1.1	2	33
fenvaleraat	51630-58-1	0.3	<	<	71
iprodion	36734-19-7	7.3	7.1	3.6	10
kresoxim-methyl	143390-89-0	0.3	<	<	46
lindaan	58-89-9	<	0.2	1.2	26
metolachloor (-S)	51218-45-2	4590	2650	2510	25
metribuzin	21087-64-9	64	103	152	1

		Drain Yard 1	Drain Yard 2	Drain Yard 3	Average TWA Yard
	Sampler	SR	SR	SR	
	Est. sampled volume in L	89	128	51	
Compound	**Cas number**	**ng/L**	**ng/L**	**ng/L**	**Days**
pendimethalin	40487-42-1	42	0.5	1.8	All
pirimicarb	23103-98-2	11	16	38	3
propyzamide	23950-58-5	7.5	8.3	11	5
prosulfocarb	52888-80-9	47	2.8	3.9	All
pyrimethanil	53112-28-0	6	6.7	4	13
simazine	122-34-9	12	3.3	1.9	1
tebufenpyrad	119168-77-3	<	0.1	<	All
terbutylazine	5915-41-3	<	0.9	1.6	14
terbutryn	886-50-0	0.1	<	0.5	37
tolclofos-methyl	57018-04-9	<	0.1	<	All
tolylfluanide	731-27-1	0.1	0.2	0.7	All
tri-allaat	2303-17-5	0.2	0.2	0.3	All
triazamaat	112143-82-5	<	<	<	16
trifloxystrobin	141517-21-7	4.7	0.8	1.6	All
azaconazool	60207-31-0	1.6	2.2	1.5	9
azoxystrobin	131860-33-8	2.7	4.4	7.3	31
bitertanol (som)	55179-31-2	2.6	3	4.8	41
carbendazim	10605-21-7	146	109	48	0
chloortoluron	15545-48-9	11	<	<	2
chloridazon	1698-60-8	<	340	384	0
cyazofamid	120116-88-3	<	<	1.5	28
cycloxidim	101205-02-1	0.4	0.6	1.2	20
cyproconazool (som)	94361-06-5	12	13	51	10
difenoconazool (som)	119446-68-3	1.6	0.6	3.4	All
diuron	330-54-1	<	21	14	2
fenarimol	60168-88-9	0.6	0.7	1.3	24
fenhexamid	126833-17-8	<	<	35	1
flutolanil	66332-96-5	5.6	42	616	14
imazalil	35554-44-0	0.2	0.7	0.5	67
isoproturon	34123-59-6	2230	861	1240	3
isoxaflutool	141112-29-0	<	<	1.4	17
lenacil	2164-08-1	13	1660	1140	1
linuron	330-55-2	53	197	318	8
metabenzthiazuron	18691-97-9	<	<	1.5	4
metalaxyl	57837-19-1	11	197	115	2
metamitron	41394-05-2	194	196	122	0
monolinuron	1746-81-2	<	6.6	9.1	2
monuron	150-68-5	<	<	11	1
pencycuron	66063-05-6	16	1.3	11	All
desmedifam / fenmedifam	13684-56-5 / 13684-63-4	37	0.4	6.4	24
prochloraz	67747-09-5	0.3	0.2	0.4	All
propiconazool (som)	60207-90-1	6.7	10	13	All
tebuconazool	107534-96-3	43	43	52	29
triadimenol	55219-65-3	20	17	16	4

		Drain Yard 1	Drain Yard 2	Drain Yard 3	Average TWA Yard
	Sampler	**SR**	**SR**	**SR**	
	Est. sampled volume in L	89	128	51	
Compound	**Cas number**	**ng/L**	**ng/L**	**ng/L**	**Days**
acequinocyl	57960-19-7	0.1	<	<	All
ametoctradin	865318-97-4	0.2	<	<	52
benthiavalicarb isopropyl	177406-68-7	0.7	<	<	17
boscalid	188425-85-6	11	6.5	22	32
chlorantranilliprole	500008-45-7	<	<	256	1
chlormequat	999-81-5	1.5	<	<	34
cyflumetofen	400882-07-7	0.1	0.5	1.5	All
ETU	*96-45-7*	*X*	*X*	<	0
fluopicolide	239110-15-7	111	69	371	17
fluopyram	658066-35-4	28	51	268	66
mandipropamid	374726-62-2	0.1	0.4	1	43
mepanipyrim	110235-47-7	0.1	<	<	44
milbemectin A3	51596-10-2	<	0.1	<	All
milbemectin A4	51596-11-3	0.8	0.4	0.5	All
paclobutrazol	76738-62-0	1.7	1.5	1.2	23
piperonylbutoxide	51-03-6	0.2	0.3	0.2	All
propamocarb	24579-73-5	X	X	<	0
pyraclostrobin	175013-18-0	0.4	<	0.3	All
Pyrethrin II	121-29-9	<	0.1	<	All
quinoclamine	2797-51-5	<	<	4.4	1
bixafen	581809-46-3	0.3	0.7	2	48
chlorfenapyr	122453-73-0	1.2	<	<	All
DMST	66840-71-9	7.7	<	<	0
epoxiconazole	135319-73-2	0.7	2	5.9	All
flufenacet	142459-58-3	156	52	84	All
fluoxastrobin	361377-29-9	3	2.3	7.8	55
fluxapyroxad	907204-31-3	50	31	47	26
isopyrazam	881685-58-1	<	<	0.1	All
fipronil	120068-37-3	<	<	1.3	13
flubendiamide	272451-65-7	0.3	0.7	0.3	36
fludioxonil	131341-86-1	1.5	2	8.6	9
metoxyfenozide	161050-58-4	7	3.4	4.4	19
bentazon	25057-89-0	36	<	<	0
clopyralid	1702-17-6	6.7	<	<	0
MCPA	*94-74-6*	*0.9*	*0.7*	*0.2*	8

Tabel C.8 Measured concentration in the **Drain Yard** in **Speedisk (SD).** Sub-numericals indicate sampling periods mentioned in Table 2.2; summer and autumn/winter period. < = below limit of detection. 0= measured in very low concentration. Concentrations are indicative.

		Drain Yard 1	**Drain Yard 2**	**Drain Yard 3**
	Sampler	**SD**	**SD**	**SD**
	Est. sampled volume in L	3.1	3.7	1.7
Compound	**Cas number**	**ng/L**	**ng/L**	**ng/L**
naftaleen	91-20-3	34	43	32
acenaftyleen	208-96-8	1	3	<
acenafteen	83-32-9	4	26	8
fluoreen	86-73-7	4	34	9
fenantreen	85-01-8	5	36	11
antraceen	120-12-7	0.5	4	2
fluoranteen	206-44-0	2	6	3
pyreen	129-00-0	1	5	3
benzo(a)antraceen	56-55-3	<	0	<
chryseen	218-01-9	1	1	1
benzo(b)fluoranteen	205-99-2	0.4	0.4	<
dibenzo(ah)antraceen	53-70-3	0.4	0.4	1
anthraquinone	84-65-1	<	3	<
chloorprofam	101-21-3	4763	2410	3716
DEET	134-62-3	4	8	10
BAM	2008-58-4	28	71	113
dimethenamid (-P)	87674-68-8	1855	2547	884
ethofumesaat	26225-79-6	66	259	213
kresoxim-methyl	143390-89-0	<	<	7
metolachloor (-S)	51218-45-2	4303	2190	1771
metribuzin	21087-64-9	11	57	43
pendimethalin	40487-42-1	14	<	<
pirimicarb	23103-98-2	1	2	5
procimidon	32809-16-8	27	19	29
prosulfocarb	52888-80-9	17	<	<
trifloxystrobin	141517-21-7	<	<	34
azoxystrobin	131860-33-8	2	4	6
carbendazim	10605-21-7	32	36	25
chloortoluron	15545-48-9	79	943	588
cycloxidim	101205-02-1	<	4	<
cyproconazool (som)	94361-06-5	<	4	20
diuron	330-54-1	2	<	<
fenbutatinoxide	13356-08-6	7	<	<
flutolanil	66332-96-5	<	11	309
imidacloprid	138261-41-3	<	5	7
isoproturon	34123-59-6	601	475	445
isoxaflutool	141112-29-0	<	<	13
lenacil	2164-08-1	<	232	222
linuron	330-55-2	16	44	172
metalaxyl	57837-19-1	2	114	38
metamitron	41394-05-2	5	295	52

		Drain Yard 1	Drain Yard 2	Drain Yard 3
	Sampler	SD	SD	SD
	Est. sampled volume in L	3.1	3.7	1.7
Compound	**Cas number**	**ng/L**	**ng/L**	**ng/L**
metsulfuron-methyl	74223-64-6	<	8	<
oxamyl	23135-22-0	<	4	8
pencycuron	66063-05-6	5	<	7
desmedifam / fenmedifam	13684-56-5 / 13684-63-4	4	<	<
propiconazool (som)	60207-90-1	5	7	9
tebuconazool	107534-96-3	23	33	43
triadimenol	55219-65-3	3	6	<
boscalid	188425-85-6	13	18	39
chlorantranilliprole	500008-45-7	<	<	158
chlormequat	999-81-5	20	<	<
Cinerin II	121-20-0	2	<	<
clothianidin	210880-92-5	<	5	4
daminozide	1596-84-5	<	<	3
ETU	96-45-7	3	2	<
flonicamid	158062-67-0	4	78	40
fluopicolide	239110-15-7	113	143	654
fluopyram	658066-35-4	17	33	216
mepanipyrim	110235-47-7	2	<	3
milbemectin A4	51596-11-3	8	5	24
paclobutrazol	76738-62-0	<	2	<
propamocarb	24579-73-5	40	97	90
quinoclamine	2797-51-5	<	2	<
spirodiclofen	148477-71-8	3	<	<
thiofanate-methyl	23564-05-8	3	4	<
bixafen	581809-46-3	1	2	<
chlorfenapyr	122453-73-0	2	1	<
DMST	66840-71-9	<	1	<
epoxiconazole	135319-73-2	2	6	14
flufenacet	142459-58-3	156	75	72
fluoxastrobin	361377-29-9	3	3	7
fluxapyroxad	907204-31-3	28	31	53
isoprocarb	2631-40-5	<	1	<
fludioxonil	131341-86-1	<	4	10
metoxyfenozide	161050-58-4	10	12	14
tepraloxydim	149979-41-9	<	1	<
2,4-D	94-75-7	<	<	15
bentazon	25057-89-0	158	252	79
bromoxynil	1689-84-5	7	<	<
clopyralid	1702-17-6	<	<	1
fluroxypyr	69377-81-7	63	18	31
MCPA	94-74-6	102	366	721
MCPP	93-65-2	18	33	33