

The total amounts of bees in each group on the second day of the end of exposure and on 14 days after the end of exposure were not significantly different with that of the first assessment ( $P > 0.05$ ) (figure 6).

Before exposure, there was pollen stored in each hive, and the colonies were healthy with different portions of different brood stages, including pupae, larval, young bees. At the end of exposure, the pollen storage in each hive decreased to zero while the proportion of bees at each developmental stage did not change obviously. On 14 days after the end of exposure, there appeared pollen in each hive, also with different portions of different brood stages (figure 7).

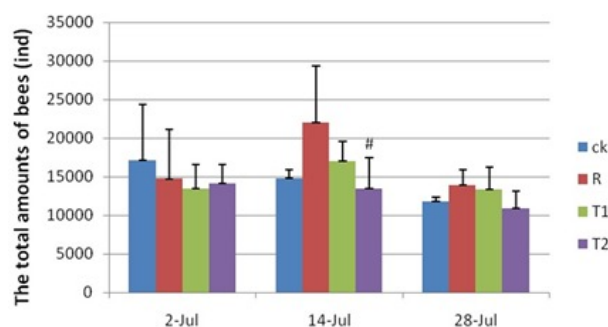
Colony condition assessment showed that: the pollen storage during the exposure period decreased to zero, while other endpoints such as the colony strength, the proportion of bees at each developmental stage did not change obviously. Under this experiment condition, sulfoxaflor had no obvious adverse effect on the strength and the condition of the test bees.

#### Sulfoxaflor residues on cucumber flowers

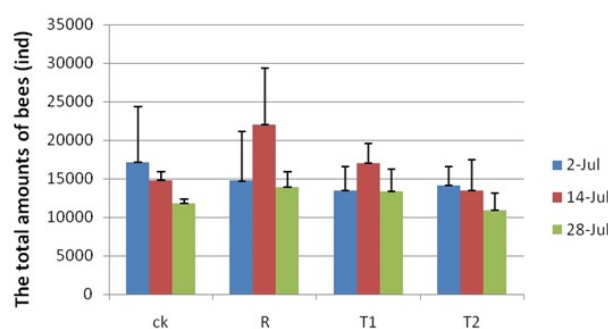
##### Limit of Detection and Limit of Quantitation

The limit of detection (LOD) and limit of quantitation (LOQ) of sulfoxaflor in cucumber flower were calculated according to 0.01 mg/kg added recovery experiment. LOD was three-time standard deviation (0.0018 mg/kg) while LOQ was ten-times standard deviations (0.006 mg/kg).

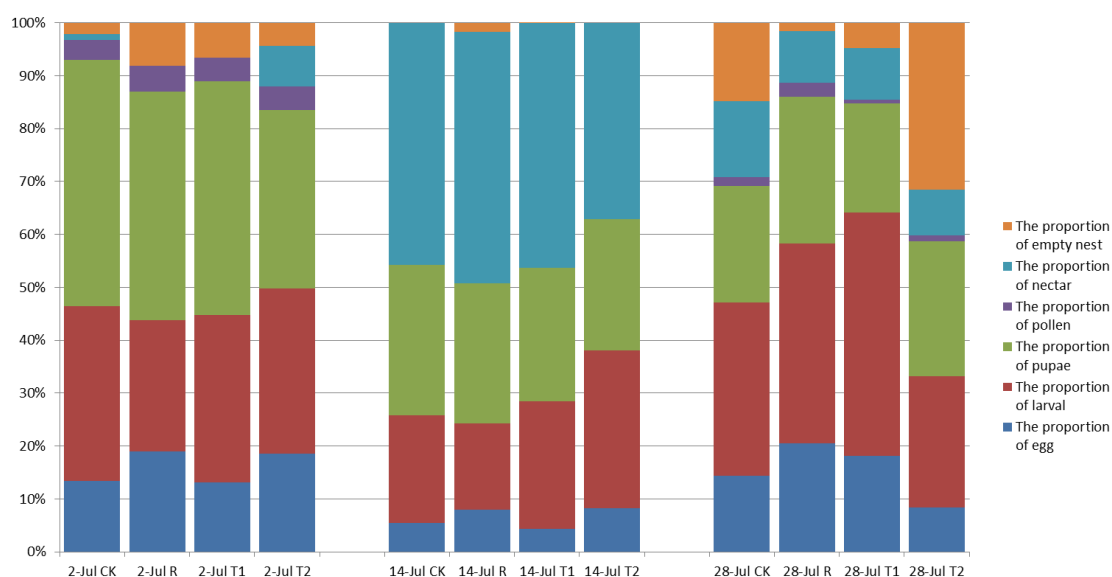
The limit of detection (LOD) and limit of quantitation (LOQ) of dimethoate in cucumber flower were calculated according to 0.02 mg/kg added recovery experiment. LOD was three-time standard deviation (0.0009 mg/kg) while LOQ was ten-times standard deviations (0.003 mg/kg).



**Figure 5.** Comparison of the total amounts of bees at the same time. CK: water control; R: reference substance treatment, dimethoate 600 g a.i./ha applied on July 8; T1: sulfoxaflor treatment, 75 g a.i./ha applied on July 1 and July 8; T2: sulfoxaflor treatment, 100 g a.i./ha applied on July 1 and July 8.



**Figure 6.** Comparison of the total amounts of bees in same group before exposure, on the second day of the end of exposure and on 14 days after the end of exposure. CK: water control; R: reference substance treatment, dimethoate 600 g a.i./ha applied on July 8; T1: sulfoxaflor treatment, 75 g a.i./ha applied on July 1 and July 8; T2: sulfoxaflor treatment, 100 g a.i./ha applied on July 1 and July 8.



**Figure 7.** Change of colony conditions before exposure, on the second day of the end of exposure and on 14 days after the end of exposure. CK: water control; R: reference substance treatment, dimethoate 600 g a.i./ha on July 8; T1: sulfoxaflor treatment, 75 g a.i./ha on July 1 and July 8; T2: sulfoxaflor treatment, 100 g a.i./ha on July 1 and July 8.

### Recovery rate

The average added recovery rates of three concentrations (0.01 mg/kg, 0.1 mg/kg, and 1 mg/kg) of sulfoxaflor in cucumber flower were respectively 88.18%, 90.10% and 93.99%. Mutation coefficients (relative standard deviations) were respectively 7.5%, 5.2% and 4.7%.

The average added recovery rates of three concentrations (0.02 mg/kg, 0.1 mg/kg, and 1 mg/kg) of dimetho-

ate in cucumber flower were respectively 74.66%, 81.83% and 71.28%. Mutation coefficients (relative standard deviations) were respectively 9.4%, 6.6% and 5.9%.

### Summary of analytical results

Residue determination results of sulfoxaflor and dimethoate could be seen in tables 1-3.

**Table 1.** Relative average residues of sulfoxaflor in cucumber flower after the first application (mg/kg).

Date	CK	First application		T2 (mg/kg)	
		Residue	Mean Residue	Residue	Mean Residue
July 1	<0.006	5.288	5.004 ± 1.206	6.576	5.283 ± 1.424
	<0.006	6.043		3.756	
	<0.006	3.681		5.519	
July 2	<0.006	0.448	0.667 ± 0.207	1.553	1.356 ± 0.217
	<0.006	0.858		1.123	
	<0.006	0.696		1.394	
July 3	<0.006	0.475	0.601 ± 0.267	0.731	1.085 ± 0.323
	<0.006	0.420		1.162	
	<0.006	0.908		1.362	
July 4	<0.006	0.410	0.653 ± 0.435	0.480	0.457 ± 0.118
	<0.006	1.155		0.329	
	<0.006	0.394		0.562	
July 5	<0.006	0.249	0.307 ± 0.051	0.383	0.332 ± 0.107
	<0.006	0.345		0.209	
	<0.006	0.328		0.403	
July 6	<0.006	0.030	0.144 ± 0.108	0.140	0.189 ± 0.091
	<0.006	0.245		0.295	
	<0.006	0.157		0.133	
July 7	<0.006	0.039	0.100 ± 0.077	0.254	0.198 ± 0.048
	<0.006	0.074		0.169	
	<0.006	0.187		0.171	
Half-life period (days)		1.25		1.30	

**Table 2.** Relative average residues of sulfoxaflor in cucumber flower after the second application (mg/kg).

Date	CK	Second application			
		T1 (mg/kg)	T2 (mg/kg)		
		Residue	Mean Residue	Residue	Mean Residue
July 8	<0.006	5.584	5.510 ± 0.101	6.625	5.832 ± 0.728
	<0.006	5.551		5.676	
	<0.006	5.395		5.195	
July 9	<0.006	1.863	1.647 ± 0.302	4.297	3.433 ± 1.086
	<0.006	1.776		3.787	
	<0.006	1.302		2.214	
July 10	<0.006	0.787	0.548 ± 0.243	1.238	1.109 ± 0.267
	<0.006	0.555		0.802	
	<0.006	0.302		1.287	
July 11	<0.006	0.394	0.572 ± 0.235	1.097	0.891 ± 0.199
	<0.006	0.838		0.877	
	<0.006	0.483		0.700	
July 12	<0.006	0.137	0.228 ± 0.106	0.421	0.465 ± 0.143
	<0.006	0.344		0.349	
	<0.006	0.204		0.625	
July 13	<0.006	0.130	0.155 ± 0.034	0.323	0.304 ± 0.026
	<0.006	0.179		0.314	
	<0.006	<0.006		0.274	
Half-life period (days)		1.02		1.15	