

I Production of lambda-cyhalothrin in China

I-1 Production technology of lambda-cyhalothrin in China

The production of lambda-cyhalothrin technical needs several reaction steps. The first step is the reaction of tert-butyl alcohol and 3,3-dimethyl-4-pentenoic acid methylester to synthesize cyclopropanecarboxylic acid. The second is after acylchlorination of 3, 3-dimethyl-4-Pentenoic acid methylester, 3-dimethyl-4-Pentenoic acid methylester reacts with 3-phenoxybenzaldehyde via condensation and translocation to finally produce lambda-cyhalothrin.

Figure I-1-1 Synthesis route of cyclopropanecarboxylic acid

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Figure I-1-2 Acylchlorination, condensation and translocation

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I-2 Summary of lambda-cyhalothrin technical production

◆ Active producers of lambda-cyhalothrin technical

As of Jun. 2009, there have been ■ lambda-cyhalothrin technical producers in China, among which ■ are active, ■ stopped and ■ suspended. It's estimated that the output of ■ active manufacturers accounts for ■ of total in China.

Table I-2-2 Capacity and output of lambda-cyhalothrin technical's active producers, 2008 and 2009 (Unit: tonne)

No.	Abbr.	Capacity 09	Output 08	Concentration
1	■	■	■	■
2	■	■	■	■
3	■	■	■	■
4	■	■	■	■
5	■	■	■	■
6	■	■	■	■
7	■	500	80	97%
8	■	■	■	■
9	■	■	■	■
10	■	■	■	■
11	■	■	■	■
12	■	■	■	■
13	■	■	■	■
14	■	■	■	■

15				
16				
Total				

Source: CCM International

██████████ is the biggest lambda-cyhalothrin technical producer in China, whose production capacity and output reached ██████ t/a and ██████ tonnes in 2008, respectively accounting for ██████ and ██████ of China's total.

Table I-2-3 Output volume and structure of major lambda-cyhalothrin in China, 2008 (Unit: tonne)

Item		Formulation				Total
		2.5% EC	4.5% EC	5% EC	10% WP	
Output	Volume	12,400	█████	█████	420	█████
	Percentage	█████	█████	█████	3.04 %	100.00%
Technical Consumption	Volume	█████	█████	34.0	42.0	█████
	Percentage	█████	3.38%	█████	10.51 %	100.00%

Source: CCM International

Table I-2-4 Capacity structure of major active producers of lambda-cyhalothrin technical, 2008

No.	Capacity (100%, t/a)	Number of producer	Share
1	2,000	█████	█████
2	500-1000	█████	█████
3	Less than 500	█████	█████
Total		█████	█████

Source: CCM International

██████████ is the only manufacturer whose production capacity exceeds ██████ t/a. There are ██████ manufacturers achieving their production capacity of ██████ t/a, with their output accounting for about ██████% of total in China in 2008. Besides, the output of another ██████ smaller-scale producers constituted ██████% of total in 2008. But the production capacity of all active producers only captured ██████% of China, and the remaining ██████% belong to ██████ stopped or idle producers.

The exports of lambda-cyhalothrin formulation concentrated in the second half of 2008, while different from formulation, the technical export was relatively stable all the year round except Jan.

I-6 Export situation of lambda-cyhalothrin in China

◆ Export situation in 2008

The export volume of formulation is around ██████ times of technical's and the peak season for formulation export was Aug. and Oct.

Figure I-6-1 Export volume of lambda-cyhalothrin, 2008

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Table I-7-2 Export volume of lambda-cyhalothrin formulation, 2008 (Unit: tonne)

Month	10% WP	2.5% EC	5% EC
Jan-08			
Feb-08			26.100
Mar-08			
Apr-08			
May-08			
Jun-08	12.866		
Jul-08			
Aug-08			
Sep-08			
Oct-08			
Nov-08		97.830	
Dec-08			
Total			

Source: CCM International

The major export destinations of Chinese lambda-cyhalothrin technical are [REDACTED], [REDACTED] and [REDACTED], with their total quantity of [REDACTED] tonnes, accounting for [REDACTED]% of China's total export volume. The formulation was mainly exported to [REDACTED], [REDACTED], [REDACTED], [REDACTED] in 2008. The 2.5%EC volume that exported to Nigeria reached [REDACTED] tonnes in the past one year, capturing about [REDACTED]% of China's total export volume.

◆ Export situation in 2009

Since Jan.2009, Jiangsu Yangnong has reduced their lambda-cyhalothrin output. Some manufacturers CCM contacted claimed that, Jiangsu Yangnong has supplied their raw materials of lambda-cyhalothrin to Syngenta since 2009, which leads to Jiangsu Yangnong's less output of lambda-cyhalothrin in 2009. Nanjing Redsun has become the biggest exporter during the periods of Jan.-Apr. 2009, whose export volume was [REDACTED] tonnes, accounting for around [REDACTED]% of the total (including technical and formulation).

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Table I-6-4 Export situation of lambda-cyhalothrin producers in China, 2009

No.	Manufacturer	2.5% EC		5% EC		Tech.	
		Quantity	Price	Quantity	Price	Quantity	Price
1	[REDACTED]	[REDACTED]	[REDACTED]	44.284	5.96	[REDACTED]	[REDACTED]
2	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
3	[REDACTED]	38.000	3.56	21.500	[REDACTED]	[REDACTED]	[REDACTED]

4	████████████████████	██████	████	████	████	████	████
5	████████████████████	██████	████	████	████	████	████
6	████████████████████	██████	████	████	████	████	████
7	████████████████████	██████	████	████	████	████	████
8	████████████████████	██████	████	████	████	████	████
9	████████████████████	2.000	4.68	4.200	████	████	████
10	████████████████████	██████	████	████	████	████	████
11	████████████████████	██████	████	████	████	████	████
12	████████████████████	██████	████	████	████	████	████
13	████████████████████	██████	████	████	████	████	████
14	Others	██████	████	████	████	████	████
	Total	██████	████	████	████	████	████

Source: CCM International

As of Apr. 2009, India was one of the main destinations of Chinese lambda-cyhalothrin technical, and Nigeria was the major export destination of formulation. The price of technical was almost the same as the situation last year, maintaining at around USD █████ kg, but formulation price rose a little, especially for 5% EC, the price increased from USD █████/kg to USD █████/kg.

II-2 Consumption of lambda-cyhalothrin formulations

◆ Consumption pattern

Lambda-cyhalothrin is mainly used in vegetable and cotton in China. The consumption volume in these two crops was around █████ tonnes, accounting for █████% of the total in 2008. In addition to vegetable and cotton, lambda-cyhalothrin can also be used in fruit tree, tea tree, wheat and other crops.

Figure II-2-1 Consumption structure of lambda-cyhalothrin in China

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