CALIFORNIA DEPARTMENT OF FOOD & AGRICULTURE
Karen Ross, Secretary

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Department of Pesticide Regulation

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SUBJECT: Acreage treated with non-TIF methods and estimated annual cost of adding TIF tarp

Background

1,3-dichloropropene (1,3-D) is a pre-plant soil fumigant used to control soil-borne pests such as nematodes, insects, and disease-causing organisms in various California crops. Human health risks associated with 1,3-D emissions resulted in restrictions on its use within the state beginning in the mid-1990s. Currently, it is a restricted use material requiring a permit for application from the County Agricultural Commissioners (CACs).

To minimize human exposure to 1,3-D emissions from agricultural applications, the Department of Pesticide Regulation (DPR) implemented regulations to establish setbacks around occupied structures including minimum setback distances and durations, and maximum application rates and block sizes. These became effective on January 1, 2024. Based on a joint risk determination by DPR and OEHHA, DPR proposed new regulations that will change buffer zone distances and duration periods based on field fumigation method (FFM) groups and crops.

The Office of Pesticide Consultation and Analysis (OPCA) completed economic analyses showing the potential cost of compliance with the new proposed regulation to be $84,136 - $125,971 for the initial year and $71,664 - $103,866 annual after the first year. This estimated cost assumes that all neighboring properties will agree to buffer implementation, and growers do not face additional expenses. While unlikely in most cases, if a neighbor refuses, the grower will need to adopt alternative compliance measures. In such a scenario, totally impermeable film (TIF) tarp application would be the lowest-cost option that allows growers to keep the same crops. If all neighbors refused, all applications with buffers would have to move to TIF. DPR asked OPCA to assist in estimating the total acreage of row crops and trees/ grapes that did not use the TIF tarp application methods between 2019 and 2023 and estimate the cost increase of adding TIF tarp using 2024 costs.

Methods

Using the 1,3-D application data provided by DPR for the years 2019 to 2023, we first calculated the total acreage of row crops, trees/grapes, pre-plant, nursery, and other crop types that did not use the TIF tarp application methods (FFMs 1242, 1247, 1249, 1243, 1245, and 1259). The 40% TIF with 18-inch (1250) and 24-inch (1264) injection depth method were not created until 2024, so data were not available.

We then estimated the potential cost increase for affected applications using 2024 costs for row crops and trees/grapes. For row crops, the estimated cost of switching to TIF tarp application included adding or removing the tarp ($207), TIF film ($844), and drip tape ($238 if needed). This resulted in an estimated cost of $1,289 and $1,051 per acre with and without the drip tape, respectively. For trees and grapes, the cost of switching was estimated at $1,644 per acre. This cost considers the price difference between TIF tarped ($687) and non-tarped ($126) application methods ($561), the cost of TIF film ($844), and glue ($239).

Findings

Acreage Treated with non-TIF Methods

We found an average of 20,276 (16,628 to 22,431) acres for row crops, 13,997 (7,973 to 16,880) acres for trees/grapes, 1,139 (649 to 1,389) acres for pre-plant, 25 (3 to 52) acres for nursery, and 18 (0 to 72) acres for other crops (research commodity) that might need to switch to TIF tarp applications (Table 1).

Table 1: Acreage of Crops without TIF Tarp Applications between 2019 and 2023

Year	Acres Treated				
	Row crops	Trees/vines	Pre-plant	Nursery	Other
2019	21,966	16,446	1,094	46	5
2020	22,431	16,880	1,247	18	3
2021	20,276	15,513	1,316	52	0
2022	20,079	13,171	1,389	7	72
2023	16,628	7,973	649	3	9

Cost of switching to TIF Tarp Applications

The estimated average annual cost increases are $23,010,410 for trees/grapes, $26,135,764 for row crops considering the cost of drip tape and $21,310,076 excluding the drip tape cost. If fields treated pre-plant were for tree/grapes, the average annual cost increase for those fields would be $1,872,516, leading to a total of $24,882,926 for trees/grapes. If fields treated pre-

plant were used for row crops, the average annual cost increase for those fields would be $1,468,171 and $1,197,089, leading to a total of $27,603,935 and $22,507,165 for row crops with and without drip tape, respectively (Table 2). Therefore, the average annual cost increase could range from $23 million (excluding pre-plant acreage) to $25 million (including pre-plant acreage) for tree/grapes and from $21 million (excluding the drip tape cost and pre-plant acreage) to $28 million (including the drip tape cost and pre-plant acreage).

Table 2: Estimated Annual Cost of Switching to TIF Tarp Applications between 2019 and 2023

Year	Cost					
	Row crops with drip tape	Row crops without drip tape	Tree/grape	Pre-plant = row crops with drip tape	Pre-plant = row crops without drip tape	Pre-plant = tree/grape
2019	$28,314,174	$23,086,266	$27,037,224	$1,410,166	$1,149,794	$1,798,536
2020	$28,913,559	$23,574,981	$27,750,720	$1,607,383	$1,310,597	$2,050,068
2021	$26,135,764	$21,310,076	$25,503,372	$1,696,324	$1,383,116	$2,163,504
2022	$25,881,831	$21,103,029	$21,653,124	$1,790,421	$1,459,839	$2,283,516
2023	$21,433,492	$17,476,028	$13,107,612	$836,561	$682,099	$1,066,956

This analysis does not account for the fact that currently there is an insufficient reserve of TIF tarp for this to be implemented and costs would likely go up. While not a direct cost to growers, an additional consideration is the volume of plastic waste produced by TIF tarp use.