November 9, 2023
Ms. Karen Morrison, Chief Deputy Director
Department of Pesticide Regulation
1001 I Street
Sacramento, CA 95814-2828

SUBJECT: TriCal, Inc. Comments Regarding *Department of Pesticide Regulation Draft Strategic Plan 2024-28*

Submitted via DPR portal and emailed to karen.morrison@cdpr.ca.gov and alternatives@cdpr.ca.gov

Dear Chief Deputy Director Morrison,

TriCal appreciates the opportunity to comment on *Department of Pesticide Regulation's Draft Strategic Plan 2024-28*. TriCal acknowledges the intent of DPR's Strategic Plan and shares in its desire to protect human health and the environment by fostering sustainable pest management and honors the values and DEI commitment surrounding a vision "where pest management is safe, effective, and sustainable for everyone." The documented Strategic Goals as outlined in the Strategic Plan are valiant and at the same time afford an opportunity for greater clarification and as such, greater effectiveness and impact.

After reviewing DPR's four outlined goals, we feel there is an opportunity to better align on how the goals are realistically implemented to best serve all Californians, ensuring a safe, equitable, and affordable food supply, and specifically transparency surrounding benefits for underserved populations and communities, while balancing the need for public and environmental safety. At a high level, we see opportunities for improved alignment in these key areas:

1. *Defining urban vs. agriculture goals, and understanding the nuances of the different products under the broad definition of pesticides, and the subsequent implications*

2. *Understanding the full economic implications of mitigating vaguely defined "high-risk" pesticides and without clarification on what will be considered a valid and available "alternative"*

3. *Better defining metrics, benchmarks, and how we will collectively define "success"*

4. *Greater need for transparency and opportunities to collaborate and contribute to this process in a way that collectively brings along multiple diverse stakeholder groups*

As we delve deeper into each of the aforementioned opportunities, it is important to note that we fully acknowledge how complex this process is. As such, we feel it is imperative that we share as much relevant, peer-reviewed data to support the suggestions we are making, in hopes that we can all align to agreed upon scientific facts. It is also important to note that much of our objection to DPR's SPM and subsequent Strategic Plan as currently written stems from vague language and a lack of science-backed, actionable requests. While we agree with DPR's overall premises, we need to voice our concerns over how this roadmap comes to life, in a way that is equitable and just for all Californians.

The remainder of our comments will take a deeper dive into each of the above outlined opportunities.

1. Defining urban vs. agriculture goals, and understanding the nuances of the different products under the broad definition of pesticides, and the subsequent implications

Just as the SPM Roadmap delineates Agriculture and Urban interfaces, TriCal encourages DPR to place each of its Strategic Plan goals within those differentiated contexts. This sentiment cannot be over emphasized, as the implications of each subcategory vary greatly and only when viewed in the proper context can any informed directives be made.

Take for example "Goal 1: Increase Access to Safe, Effective, Sustainable Pest Management." The issues of access, availability, efficacy, and safety vary greatly amongst the over 1,000 pesticides registered in California and used in the assorted contexts that fall under Agriculture and Urban categories. Taking this a step further, there are vast differences within the Agricultural pesticide category itself, with differentiation and understanding needed amongst pre-plant soil fumigants (which never touch food and leave zero residues) vs. post-planting topical pesticides, which are often what come to mind by both consumers and advocacy groups.

Therefore, we strongly urge DPR's goals and sub-goals be specified according to the pest management tactics and pesticide category used (Agriculture or Urban), along with education both internally and externally on the important but often misunderstood differences between the subcategories of pesticide use, such as:

- for protecting food production for a growing global population from pests such as soilborne diseases, weeds and nematodes
- for protecting structures that safely store food (such as nuts, grains, baby formula) from pests
- for protecting people's homes from destructive pests (especially during a housing shortage)
- for protecting buildings such as hospitals from viruses and hotels from bed bugs and other pests
- for protecting communities from pests such as mosquitoes
- for protecting the environment for wildlife and healthy ecosystems
- for protecting the integrity of community landscapes and shared public spaces
- for protecting against invasive species that require rapid action with the highest level of control possible

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2. Understanding the full economic implications of mitigating vaguely defined "high-risk pesticides" and without clarification on what will be considered a valid and available "alternative"

As currently written, the SPM and Strategic Plan do not adequately consider the economics of providing a stable and affordable food supply for Californians. We feel it cannot be overstated that there will be economically detrimental effects to consumers at market. We are specifically concerned for underserved populations and communities, and how inefficiencies in growing are an impediment to providing access to healthy foods in these communities.

A holistic view of sustainability needs to consider the environment, economics, and social implications like affordable accessibility to food.

For example, farmers currently face immense pressure to feed a growing global population, with limited land and space, all while being challenged to keep food affordable as input costs rise. If we take away their ability to safely and effectively manage pests, the result will be crop shortages and rising food costs.

According to the Food and Agriculture Organization of the United Nations (FAO), global food demand is expected to increase 70% by 2050–and food prices are expected to rise as much as 100 percent during the

same time period[1]. Therefore, sustainable agriculture will be vital to increasing productivity while confronting significant environmental constraints and challenges.

The FAO goes on to say that there are more than 80,000 plant diseases, 30,000 weed species, 10,000 insects and 3,000 worms that can all negatively affect global crop production, and without crop protectants, the average consumer would spend 30 – 40% more of their income on food! "Between 26% and 40% of the world's potential crop production is lost annually because of weeds, pests and diseases, and these losses could double without the use of crop protection practices. Studies estimate that the food produced today with the yield levels of 1961 would require an additional 970 Million hectares, or more than the total land area of the United States. Crop protection products also play a major role in water conservation by efficiently controlling invading alien plants that threaten scarce water resources."[2]

According to a study in Prodcedia Environmental Sciences, "plant parasitic nematodes are causing much more damage annually compared to insect pests. A crop yield loss due to these tiny unseen pests in various countries is enormous. They caused projected yield loss of 12.3% ($157 billion dollars) worldwide."[3] The study goes on to say that nematodes present a huge threat to global food security, causing even more damage than insects, because they are microscopic in size and often hard to identify. The report further states that "future agricultural growth must come from productivity growth to address the persistent problems of poverty, food insecurity and malnutrition," and goes on to recommend integrated pest management plans and the use of targeted soil fumigation to help farmers manage yields and sustain their agricultural operations.

It is also important to consider the evolving threat of climate change within the context of sustainability and agriculture at large. Recent studies show that climate change threatens the ability to meet the crucial 70% yield-increase needed to feed the growing global population[4]. Estimates show that climate change effects have already reduced global agricultural production by 1-5%, per decade, and with warming global temperatures and increased rainfall, this number is expected to accelerate as nematodes and plant pathogen populations continue to rise[5]. In other words, as the world gets warmer and wetter, we will see nematode/pest populations grow—making it more vital than ever for farmers to have options to combat these destructive pests. Now is not the time to take away the tools growers have (i.e. pesticides), but rather, reexamine the stewardship of these products to ensure the safe usage and application of these products.

Negative Economic Impacts on Growers:

- Research shows that organic or biopesticide alternatives to traditional pesticides are costlier, less effective, and require additional measures by the grower and PCA's to apply effectively. Extrapolating this out, what happens when the "preferred" alternative is applied in a 3:1 ratio to get the same control/efficacy? Who will be responsible for monitoring the economic and environmental sustainability of this approach? If a 1:1 usage ratio is maintained, and efficacy goes down, causing food costs to rise due to lower yields, who will be responsible for monitoring and reporting on rising food costs, and potentially lower exports (~13% export reduction)?
- Currently, California arguably has the highest input costs across all of the USA due to higher-than-national-average labor costs. What happens when the costs are too much to bare? Pushing

[1] FAO (2009, September 23). *2050: A third more mouths to feed.* Food and Agriculture Organization of the United Nations. Retrieved October 27, 23, from https://www.fao.org/news/story/en/item/35571/icode/

[2] OECD/FAO (2012), *OECD-FAO Agricultural Outlook 2012*, OECD Publishing, Paris, https://doi.org/10.1787/agr_outlook-2012-en.

[3] Singh, S., Singh, B., & Sing, A. (2015). Nematodes: A Threat to Sustainability of Agriculture. *Procedia Environmental Sciences.*, *Volume 29*(2015), 215-216. https://doi.org/10.1016/j.proenv.2015.07.270

[4] Newbery, F., Qi, A., & Fitt, B. D. (2016). Modelling impacts of climate change on arable crop diseases: progress, challenges and applications. *Current opinion in plant biology*, *32*, 101–109. https://doi.org/10.1016/j.pbi.2016.07.002

[5] Somasekhar, N., Prasad, J.S. (2012). Plant – Nematode Interactions: Consequences of Climate Change. In: Venkateswarlu, B., Shanker, A., Shanker, C., Maheswari, M. (eds) Crop Stress and its Management: Perspectives and Strategies. Springer, Dordrecht. https://doi.org/10.1007/978-94-007-2220-0_17

growers out of California will lead to a decrease in taxes collected/state revenue, and a lack of support services for all citizens—especially those in the communities who already struggle with affordability at the current level of services provided.

Economic Impacts on Consumers/Unintended Negative DEI Consequences to the Most Vulnerable:

- Research shows that lower income consumers spend higher percentages of their budget on food as opposed to middle and upper class earners. Increases to food prices therefore disproportionally affect low income communities than high-income communities. With DEI as a goal of DPR, we feel it is vital we always consider how the proposed changes will ultimately affect the most vulnerable populations in our state.
- How do the changes suggested avoid unintended consequences and potential shifts in consumer behavior to switch to cheaper imports, often from other countries with much less stringent regulatory parameters in place? Are we creating a system that will unintentionally shift to a less safe food supply?
- As access to affordable healthcare continues to be a challenge for California's low-income populations, it is more important than ever to maintain affordable access to healthy fruits and vegetables. If costs were to spiral due to higher grower input costs, it could lead to a lack of access to an affordable, nutritional food supply at a time when overall healthcare costs are on the rise and preventable diseases like diabetes are on the rise nationwide.
- Aside from concerns over equitable access to affordable fruits and vegetables, we feel it is imperative to tie-in safe pesticide use with the ongoing housing shortage in the state. It is vital to continue to protect homes from wood destroying pests by using targeted solutions to protect the infrastructure we currently have in place.

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3. Better defining metrics, benchmarks, and how we will collectively define "success"

Throughout DPR's Strategic Plan—and specifically "Goal 2: Track, Evaluate, and Enforce Safe Pesticide Use"—there are lofty but vague suggestions of goals, with no detail to how these goals will be measured, or by whom, and how "success" will be defined/how stakeholders will know if success is achieved.

As such, we feel strongly that DPR engage subject-matter experts from within these complex industries to develop processes and metrics that are specific to the nuanced needs of each stated goal. If the goals are redefined under these nuanced constructs, they will become more clear, specific and constructive. As such, this would ensure pest management is truly safe, effective and sustainable—all within the context of what is achievable, actionable, and realistic.

The sub-goals in the document also pose an opportunity for greater clarification for effectiveness and impact. As outlined, there is uncertainty as to how will we know if/when we have achieved the goals? For example, we share in the desire for "equitable outcomes particularly disadvantaged communities." As such, which social justice metrics will be included and prioritized? Are goals related to "partnerships and collaborations for implementing SPM" and improving "timeliness and transparency of science-based evaluation and registration of pesticide products" the priorities for DPR? Would others working for social justice possibly argue that providing affordable healthy food to the food insecure could be and should be a metric worth including and measuring as part of the plan?

Our desire would be to understand not only the social and environmental metrics that will be included (as compared to the ones that will not) but also the baselines that will be used? What are they specifically? Where did they come from or where will they come from? What data will be included? Who gets to be involved in the decision-making?

On this specific point, we have collated information from various university and government agencies for specific crops (almonds, lettuce, carrots, tomatoes, potatoes, and strawberries), including USDA, CDFA, and UC Davis, which shows how food costs would rise exponentially if California growers no longer had access to "conventional" crop protection tools (i.e. pesticides). By comparing conventional food costs to organic food costs, we can extrapolate that not only would consumer food costs rise upwards of $49B annually, but the state would also see a necessary increase of 1.4M acres of land to yield the same amount of food due to less efficiencies for organic production. Additionally, to yield the same tonnage of crops, organic production would require 1.3 trillion more gallons of water and emit 2.3 million additional pounds of carbon emissions. If growers do not have ways to manage soil-borne diseases and plant parasitic nematodes effectively, we are at risk of producing less and at a higher cost—both economically and environmentally. For a full analysis of organic versus conventional crops and the economic and environmental extrapolations, see Exhibit A in the attached Appendix.

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4. Greater need for transparency and opportunities to collaborate and contribute to this process in a way that collectively brings along multiple diverse stakeholder groups

"Pesticides" is a broad category that is often misunderstood and viewed in a vacuum. Our fear is that DPR's SPM and Strategic Plan as currently drafted do not consider a holistic view of California's dynamic agriculture landscape and fail to engage subject-matter experts as warranted. For example, new advances in genetic sequencing are able to understand soil biomes at a cellular level that was previously not possible. It is therefore vital that DPR has a diverse group of industry experts and scientists who are familiar with scientific advancements in this very niche segment of agriculture. We now have access to scientific methods that previously did not exist, and what the science is telling us is this is way more complex, nuanced, and intertwined than previously believed.

Plant parasitic nematodes cause an estimated $157 billion of economic losses each year[6]. Growers depend on soil fumigation to manage these pests. The best tool growers currently have to manage nematodes is 1,3 Dichloropropene, sold under the brand name TELONE™. Advances in scientific genome sequencing confirm that soil fumigation with TELONE™ does not sterilize the soil, but rather shifts microbial populations towards organisms that help replenish soil health, with microbial populations rebounding in as little as six weeks post-fumigation. In other words, we now have the scientific tools to examine soil at a cellular level, which was previously not feasible, and the results are eye-opening.

In light of evolving science and the desire to cut through any political biases, we feel that this is a great opportunity for DPR to partner with the agriculture industry to educate consumers as well as regulatory/political officials on the evolving science and complexities of often-repeated but often-misunderstood buzz words like "sustainability" and "soil health." By working with industry experts and being transparent about the science being used to inform policy, we are better-equipped to make the best holistic decisions for all Californians. Of particular note, we urge DPR to consult the work being done by the third-

[6] Singh, S., Singh, B., & Sing, A. (2015). Nematodes: A Threat to Sustainability of Agriculture. *Procedia Environmental Sciences.*, *Volume 29*(2015), 215-216. https://doi.org/10.1016/j.proenv.2015.07.270

party, non-biased research company Biome Makers. Biome Makers is delving into genetic sequencing and other research to shed new light in the areas of soil health and global agriculture sustainability by decoding soil biology.

Eliminating pesticides will not solve our problems, but will exacerbate them. DPR must be thorough and transparent in its desired outcomes, clearly outlining all metrics, baselines, and relevant data from the onset. We also encourage DPR to create a systems-feedback loop wherein all relevant stakeholders have the opportunity and ability to voice feedback, concerns, and objections in a timely manner with understanding that communication will lead to a better plan for all Californians.

In conclusion, TriCal supports DPR's continued efforts to protect human health and the environment. We view ourselves as partners in the solution. We firmly believe that growers must have access to a full range of tools in order to continue feeding our growing population.

California has the strictest agriculture regulations in the world, and we are committed to setting the bar for global agriculture stewardship practices. We welcome frank and candid discussions on how to best steward these products, establishing metrics and a framework that is beneficial to consumers, the environment, and the growers/applicators of these products.

As a third-generation family-operated California business, we sincerely appreciate the opportunity to comment on DPR's Strategic Plan. We look forward to a bright future where we can continue to provide Californians with pest management that is safe, effective, and sustainable for all.

Best regards,

Dean Storkan
President and CEO, The TriCal Group

APPENDIX

EXHIBIT A: **Impacts of Organic to Conventional Agriculture for Certain Crops in California:** Almonds, Lettuce, Carrots, Tomatoes, Potatoes, and Strawberries

Impacts of Organic to Conventional Agriculture for Certain Crops in California

10/18/2023

Purpose:

To understand the economic impact on consumers if conventional commodities were no longer grown and sold in California. To evaluate the increase in acres, water, and carbon in California to meet the current market demand if organic growers were faced with the tasks of meeting 100% of current market demand without use of conventional products.

Crops Analyzed:

- Almonds
- Lettuce
- Carrots
- Tomatoes
- Potatoes
- Strawberries

Results:

Throughout this analysis, you will see the significant impact that moving towards organic would cause from an environmental and economic perspective. For the commodities identified, results show an increase of 1.4M acres, 1.3 Trillion gallons of water, and 2.3M lbs. of Carbon emissions. Additionally, economic pressure upwards of $49B would be assumed by the consumer to support this change.

California Analysis:

Acres:

Commodities	Total Acres	Conventional Acres	Organic Acres	% Organic
Almonds	1,180,000	1,174,085	5,915	1%
Lettuce	125,500	92,975	32,525	35%
Carrots	69,900	59,737	10,163	17%
Tomatoes	247,700	238,258	9,442	4%
Potatoes	41,800	28,371	13,429	47%
Strawberries	40,284	34,996	5,288	15%

Yield per Acre (Pounds):

Commodities	Conventional Yield per Acre	Organic Yield per Acre	+/-
Almonds	2,165	1,208	957
Lettuce	40,594	18,817	21,777
Carrots	76,069	30,473	45,597
Tomatoes	105,575	66,666	38,909
Potatoes	68,443	10,538	57,904
Strawberries	52,196	41,309	10,887

Total Yield per Acre (Pounds):

Commodities	Conventional Yield	Total Organic Yield	Total Yield
Almonds	2,541,653,912	7,146,088	2,548,800,000
Lettuce	3,774,184,288	612,015,712	4,386,200,000
Carrots	4,544,162,784	309,693,216	4,853,856,000
Tomatoes	25,154,052,000	629,456,800	25,783,508,800
Potatoes	1,941,791,040	141,520,960	2,083,312,000
Strawberries	1,826,651,216	218,441,992	2,045,093,208

California Results (Acreage and Water):

Assumptions- Acres and Water Usage

- Assumed a 1:1 relationship with water usage between organic and conventional growing. UC Davis Ag Department claims a 1:1 water usage for Strawberry and Almonds.
- Used the relative yield from the *De Ponti et al.* research paper and applied the same method to California reporting.
- All data is reported from the USDA 2019 data.
- Assumed a 1:1 relationship of all conventional acres going to organic to produce same quantity of output
- Could not find data on Carrot water usage per acre. Made 1:1 with Potatoes.

Relative Yield:

The relative yield states what % yield an organic acre has relative to a conventional acre. For example, an organic Strawberry field would yield 79% of what a conventionally grown field would. As reported in the assumptions, all data is from USDA 2019 reporting.

Commodities	Relative Yield
Almonds	56%
Lettuce	46%
Carrots	40%
Tomatoes	63%
Potatoes	15%
Strawberries	79%

Acres:

The table below shows that if conventional were to go away and 100% of growers were forced to plant organic to meet current market demand, an additional 1.4M organic acres would need to be planted to meet demand for these six identified commodities. Additionally, it shows what % of total acres would need to increase by crop.

Example: To keep the market demand whole with only organic production of Almonds, there would need to be 929k acres added to California. A 79% increase of the current acreage.

Commodities	Total Organic Acres	Acre increase	% Increase
Almonds	2,109,707	929,707	79%
Lettuce	233,100	107,600	86%
Carrots	159,286	89,386	128%
Tomatoes	386,759	139,059	56%
Potatoes	197,687	155,887	373%
Strawberries	49,507	9,223	23%

Water Usage:

This table below shows the current gallons per acre to grow a single acre of that commodity and total amount of water used in California for that commodity.

On the far right, you can see that moving to organic for all commodities would increase water usage in these commodities a total of 1.3 Trillion gallons per year. An 80% increase. The reason for the increase in water usage across commodities is that water is remaining constant per acre regardless of organic or conventional, however more acres are required to meet demand in organic, ultimately meaning more water used.

Commodities	Gallons of water/acre	Total Water	Total Water Increase
Almonds	1,140,468	1,345,752,240,000	1,060,301,102,631
Lettuce	325,848	40,893,924,000	35,061,400,550
Carrots	556,657	38,910,324,300	49,757,243,606
Tomatoes	828,197	205,144,396,900	115,167,993,448
Potatoes	556,657	23,268,262,600	86,775,364,881
Strawberries	746,735	30,081,472,740	6,887,291,371

California Results (Carbon Usage):

Calculations Used:

- USDA total acreage: 895,300,000
- Agricultural Emissions: 1,477,565,248,320 lbs. (11.20%)
- Agricultural Emissions per acre: 1,650lbs./acre

Assumptions:

Carbon emissions by crop and acreage is a difficult number to get exact numbers on. For the purpose of this study, I calculated out the average carbon emissions, in pounds, per acre across the entire US. Each commodity, with many inputs, changes carbon emissions so this is ultimately a best guess to get us in the ballpark. This analysis will show the increase in carbon emissions due to increased acres planted from the movement from Conventional to Organic.

Estimated Carbon Usage:

The commodities under evaluation make up a small portion of carbon emissions in US Agriculture (.0019%). Under the assumption that 100% of California demand in these commodities must be provided by organic growers, would increase carbon emissions by 83% or 2.3M lbs. for these commodities.

Commodities	Total Carbon Used	Increased Carbon Used
Almonds	1,947,422,085	1,534,349,134
Lettuce	207,119,891	177,579,277
Carrots	115,360,003	147,518,580
Tomatoes	408,793,602	229,496,587
Potatoes	68,984,952	257,268,644
Strawberries	66,483,010	15,221,590

California Results (Economics):

Economics:

- Assumed 13% of what is grown in California is exported.
- Using conventional vs. organic pricing at Safeway.

Current Estimated Spend:

The total retail value for the commodities in this report is $136B every single year.

Commodities	Conventional	Organic	Total Consumer Spend
Almonds	$ 17,689,911,228	$ 109,420,899	$ 17,799,332,127
Lettuce	$ 12,566,765,553	$ 2,378,577,032	$ 14,945,342,585
Carrots	$ 3,945,514,779	$ 323,319,718	$ 4,268,834,496
Tomatoes	$ 87,317,260,708	$ 2,732,660,806	$ 90,049,921,513
Potatoes	$ 1,348,107,847	$ 121,040,896	$ 1,469,148,743
Strawberries	$ 6,356,746,232	$ 1,138,366,753	$ 7,495,112,985
			$ 136,027,692,450

Estimated Consumer Spending:

If 100% of conventional growers were forced to move to organic and pricing stayed flat, you could predict a $49B increase of economic pressure on the consumer in the commodities listed below. A 36% Increase.

Commodities	Estimated Spend	Differential
Almonds	$ 39,027,225,600	$ 21,227,893,473
Lettuce	$ 17,046,808,397	$ 2,101,465,812
Carrots	$ 5,067,425,664	$ 798,591,168
Tomatoes	$ 111,933,946,753	$ 21,884,025,240
Potatoes	$ 1,807,020,384	$ 337,871,641
Strawberries	$ 10,657,594,235	$ 3,162,481,250
		$ 49,512,328,583

Strawberry Summary (Movement from Conventional to Organic):

- **Acreage Increase:** 9,223 acres (23%)
- **Water Increase:** 6.8B gallons (23%)
- **Carbon Increase:** 15M lbs. (23%)
- **Economics Increase:** $3.6B (42%)

References:

Acreage and yield (Organic):

https://www.nass.usda.gov/Publications/AgCensus/2017/Online_Resources/Organics/organics_1_008%20_008.pdf

https://www.nass.usda.gov/Publications/AgCensus/2017/Online_Resources/Organics/organics_1_002%20_002.pdf

Acreage and yield (Conventional):

https://www.cdfa.ca.gov/Statistics/PDFs/2020_Ag_Stats_Review.pdf

Water:

https://coststudies.ucdavis.edu/en/current/

Carbon:

https://www.ers.usda.gov/topics/natural-resources-environment/climate-change/

https://www.nass.usda.gov/Publications/Todays_Reports/reports/fnlo0222.pdf

Exports:

https://www.cdfa.ca.gov/Statistics/PDFs/2022_Exports_Publication.pdf