

MCFA

Minor Crop Farmer Alliance

Via Electronic Docket Submission <http://www.regulations.gov>

October 21, 2023

Jan Matuszko; Director
Environmental Fate and Effects Division
Office of Pesticide Programs
Environmental Protection Agency
1200 Pennsylvania Ave., N.W.
Washington, DC 20460

Re: Comments of the Minor Crop Farmer Alliance on the Draft *Herbicide Strategy Framework to Reduce Exposure of Federally Listed Endangered and Threatened Species and Designated Critical Habitats from the Use of Conventional Agricultural Herbicides*.
Docket No. EPA-HQ-OPP-2023-0365

Dear Ms. Matuszko:

These comments regarding the Environmental Protection Agency's ("Agency" or "EPA") draft *Herbicide Strategy Framework to Reduce Exposure of Federally Listed Endangered and Threatened Species and Designated Critical Habitats from the Use of Conventional Agricultural Herbicides* ("draft HSF") are submitted on behalf of the Minor Crop Farmer Alliance ("MCFA") members and supporters.¹

MCFA is an alliance of national and regional organizations and individuals representing growers, shippers, packers, handlers, and processors of various agricultural commodities, including food, fiber, turf grass, nursery and landscape crops, and organizations involved with public health pesticides. MCFA's members are extremely interested in the development and safe use of pest management tools including crop protection chemicals that are environmentally sound, safe for applicators, workers and the public, and do not represent an unreasonable adverse risk to the environment, including humans and non-target organisms such as pollinators, and endangered and threatened species. While our commodities are often called "minor crops" or "specialty crops," they contribute to the diverse and highly nutritious diets available for the global population, and to safe and aesthetic surroundings for our homes, schools, and places of business. These U.S. farmers grow more than 500 types of fruit, vegetable, tree nut, flower, ornamental nursery, and turf grass crops in addition to the major bulk (row) commodity crops. Specialty crop production accounts for more than \$60 billion, or approximately 40% of total U.S. crop receipts.

¹ The Agency originally provided a 60-day comment period for the draft HSF. Because of the sheer volume and complexity of all the documents provided by the Agency relating to the draft HSF, many stakeholders, including MCFA requested an extension of the comment period. Specifically, MCFA requested an additional 90-day extension. While MCFA appreciates the Agency's brief 30-day extension of the comment period to October 22, 2023, such extension is inadequate to fully review and comment on the draft HSF and all its related materials. Accordingly, while we prepared these initial comments for submission within the prescribed comment period, we reserve the right to supplement them.

The draft HSF reflects an approach that will have potential widespread impacts on the specialty crop agricultural community. Herbicides are widely used by specialty crop growers. Overall, if finalized as proposed, the approach reflected in the draft HSF will likely result in significant burdens for growers throughout the country because of having to address additional restrictions including in some cases, being unable to use the herbicide tools they need to address their weed problems because of their inability to feasibly reach the necessary mitigation point totals required by the draft HSF. Obviously, this will have significant negative economic consequences for their farm operations.²

Overview

The draft HSF is precautionary based. The alleged risk or harm to listed species at the population level has not been sufficiently identified or substantiated by the Agency. Its approach essentially presumes that herbicides applied in accordance with current labeling, are likely to harm listed species or adversely modify their designated critical habitat. It is not relying on the best scientific and commercial data available in its analysis. Among other things, the Agency is overestimating the potential herbicide residue exposure to listed species. As discussed below, there are additional reasonable refinements that can be made to the Agency's approach that would provide greater clarity regarding the potential effects of the use of herbicides on listed species populations. The program's approach should focus on identifying likely population-based impacts from herbicide use, and then developing appropriate responses to obviate those impacts.

In introducing the draft HSF, the Agency makes clear that a central driver of the strategy is to help avoid future lawsuits. The Agency correctly identifies the litigation risk from having pursued for years essentially a "kicked-the-can" down the road approach regarding addressing its ESA responsibilities. MCFA is sympathetic to the limitations on the resources including funds and personnel the Agency had available to address its ESA responsibilities while maintaining all the other important functions of its pesticide program operations. It is readily apparent that for many years, EPA has been operating essentially in a triage mode in addressing its ESA responsibilities involving the pesticide regulatory program. This has contributed to a substantial legal vulnerability for the Agency and some uncertainty for registrants and affected grower stakeholders involved with a pesticide that is the subject of a legal challenge. In some circumstances this has resulted in a reviewing court deciding to exercise its equitable authority and grant vacatur of the pesticide registration at issue. Whatever the reasons for the Agency's predicament, one thing is clear. The situation the Agency finds itself was not caused by the agricultural pesticide user community. Nevertheless, the Agency's proposed solution to its administrative/legal dilemma appears to be substantially directed outwardly towards the pesticide

² The draft HSF is part of the Agency's ESA Workplan implementation efforts. Because there are aspects of two prior proposed actions under the Workplan that are also applicable to the draft HSF, MCFA is incorporating by reference its previous comments submitted on those two actions. See, *Comments of the Minor Crop Farmer Alliance on the "Appendix to the ESA Workplan Update: Proposed Label Language for Public Comment,"* Docket ID No. EPA-HQ-OPP-2022-0908 ("Workplan Update comments"), and the *Comments of the Minor Crop Farmer Alliance Regarding the Draft White Paper on the Vulnerable Species Pilot Project;* Docket ID No. EPA-HQ-OPP-2023-0327 ("VSPP comments").

user community.³ The draft HSF if finalized will likely result in requiring growers to implement various mitigation measures, thereby changing their agricultural operations and practices to reduce potential exposure of listed species and their habitats to herbicide residues. In some cases, because of the grower's inability to meet the point threshold required, they will not be able to use that herbicide.

As the Agency has repeatedly been advised, many growers, particularly specialty crop growers, will not be able to adopt the listed mitigation measures.⁴ Significant impacts on their operations will occur. The potential mitigations will affect not only the potential productivity and profitability of affected growers' operations, but also potential land values. Without adequate access to herbicides, growers must resort to increasing the workforce to control weeds. However, according to USDA ERS, farm labor costs for specialty crops increased in 2023 with labor accounting for almost 40 percent of total cash expenses. In contrast, operations specializing in corn and soybeans spent the least on labor costs as a percentage of total cash farm expenses (4 percent and 3 percent, respectively) in 2020. Specialty crop farms have the highest labor cost as a portion of total cash expenses. (See, <https://www.ers.usda.gov/data-products/chart-gallery/gallery/chart-detail/?chartId=104773>) Producers who farm on rented land will also face increased challenges in trying to meet the additional label mitigation measures. The landowner may not agree to mitigation measures that affect their land.

The Agency needs to analyze what those impacts may be before proceeding in requiring additional ESA mitigation restrictions on herbicide labels.⁵ At a minimum, we agree that additional mitigation measures need to be added to the menu of mitigation options.

³ MCFA believes that based on the information currently available, the ESA dilemma confronting the Agency essentially reflects it not having performed the in-depth impacts analysis for all herbicides and therefore its inability to have a record upon which the Agency can rely if its resulting decision was challenged in court. The limited comprehensive ESA analysis that EPA has conducted to date for a select number of pesticide active ingredients has demonstrated that while these pesticides have the potential to impact individuals for many species (based on the results of Biological Evaluations), upon further careful examination (reflected in Biological Opinions), impacts that jeopardize the species at the population level are much less likely to occur for most species. See, e.g., the Malathion Biological Opinion. This is not intended to minimize the importance of protecting listed species, but rather to affirm that better understanding the magnitude of potential population impacts is critical. The consequences to the affected user community based on the analysis the Agency performs can be significant. Simply put, the lack of refinement can lead to unwarranted restrictions on growers to access the herbicide products they need.

⁴ The Agency has repeatedly minimized the challenges that growers may face in implementing the proposed mitigations. See, e.g., "The proposed mitigations reflect measures that can be readily, and are often already, implemented by growers and identified by pesticide applicators" draft HSF at page 5. The source of EPA's assertion is unclear, but the agricultural community's consistent response to the mitigations since the issuance of the Workplan Update is that implementation of the mitigation measures is very difficult and, in some cases, impossible without wholesale changes in farming practices with its attendant costs and potential other impacts, such as a potential increase in pest resistance. This was highlighted in the March 24, 2023, meeting with the Agency and the U.S. Department of Agriculture (USDA), Natural Resources Conservation Service (NRCS), in which NRCS acknowledged that its conservation programs from which the Agency's mitigations are essentially derived, are geared for major commodities and not specialty crop growers. Historically, NRCS has had little involvement with the specialty crop industry.

⁵ Included with these comments is an Appendix I highlighting for various states and crops some examples of the problems with the current menu of mitigations.

The Agency needs to refine the underlying assessments of the draft HSF.

The Agency is overestimating potential herbicide residue exposure to listed species. EPA has not considered the types of conservation measures that growers are following before determining listed species are at risk from herbicide use. The Agency needs to analyze beyond the screening level currently proposed in the draft HSF. When higher-tier data are available for a pesticide active ingredient, those data should be evaluated and fully integrated as part of the assessment, prior to making mitigation recommendations. Evaluations beyond the screening level include using probabilistic and spatial analyses that have been demonstrated to be applicable to ESA assessments. The current approach assumes the worst-case scenario occurs everywhere all the time, whereas it is generally accepted that in reality there are ranges of exposures and diversity in aquatic habitats across the landscape. The Agency has indicated it strives to use the best available data in its assessments, however there are higher-tier data available for many herbicides and other pesticides that could be used to refine assessments to better inform and avoid overly restrictive, proposed mitigations.

Analyses such as PWC+^{6,7} characterize the landscape by quantifying proximity and cropping density in relation to nearby aquatic habitats. It also estimates environmental concentrations for water bodies accounting for the proximity and intensity of agriculture. It demonstrates that the worst-case assumptions do not occur everywhere all the time and presents less extreme and more likely to occur estimates of potential exposure, as well as where they may occur. This allows more targeted mitigations to be developed when and where they are actually needed.

Another challenge that needs to be addressed by the Agency is the complexity of assessing risk for listed species at the population level. Multiple tools and approaches (such as population modeling) already exist that can be used to assess effects at the population level. Population modeling was recommended by the National Academy of Sciences for endangered and threatened species risk assessments and several population models for terrestrial plants, including listed plants, which integrate species-specific life-history traits and their ecological interactions, and realistic exposure profiles are available for risk assessment purposes. Since species-specific models cannot be developed for each species in a reasonable timeframe, it is recommended that existing population models be used and adapted to become trait-based models. EPA has recognized the existence of this information⁸ but has not incorporated all the above-mentioned recommendations.

In addition to refining the underlying risk assessments, EPA also needs to substantially refine the PULAs, reliance on species range maps in general, and specifically the four geographically defined PULAs reflected in the draft HSF. They are all substantially overbroad, thereby sweeping into the regulatory restrictions program growers whose farm operations are not

⁶ Generic Endangered Species Task Force (GESTF), 2022. *Landscape-Level Refinements for Aquatic Exposure Estimation in Endangered Species Assessments: PWC+ Methods Documentation*. [MRID 51902803]

⁷ Tessengerlo-Kerley, Inc, 2022. *Carbaryl Effects Assessment for the Upper Columbia River Steelhead (*Oncorhynchus mykiss*) – Wenatchee Population*. [MRID 51902705]

⁸ See, <https://www.epa.gov/endangered-species/implementing-nas-report-recommendations-risk-assessment-methodology-endangered>

reasonably likely to affect listed species or their designated critical habitats.⁹ Consequently, as currently constructed, there will be little benefit to listed species from such overreach, while at the same time needlessly impacting millions of agricultural production acres.¹⁰ Additionally, the Agency's reliance on broad species ranges is misplaced. EPA has indicated its intention to refine the PULAs and applicable maps in conjunction with the Services. However, given the potential impacts to affected growers, the Agency should implement its labeling restrictions only after such refinements are performed.¹¹

The Agency needs to further develop the mitigation exemption process.

MCFA agrees that a mitigation exemption process related to a runoff and/or erosion plan or a pesticide loss mitigation plan implemented according to the recommendations of a recognized conservation program or expert, need to be as practical and expansive as possible. However, the acceptable parameters of such a program are not clear. Presumably it will involve the existence of guidance addressing managing runoff or erosion applicable to a particular crop(s) or location, a technical advisory body or expert who certifies the guidance, documentation of the guidance, and ultimately, some type of verification that the guidance is being followed. Several specialty crop growers are following conservation plans that reflect limiting the ability of pesticide residues from moving offsite through runoff or erosion to non-target areas. For example, in California, there is the California Irrigated Lands Regulatory Program (ILRP). All commercial growers in California are required to conduct a farm assessment, and if necessary, develop an erosion management plan that is overseen by California's State Water Resources Board. The erosion management plan is certified by eligible experts that have been trained to conduct erosion management plans. It is believed that ILRP program clearly meets EPA's objective of preventing runoff and exposure to listed species.

Similarly in Florida, the Florida Department of Agriculture and Consumer Services (FDACS) Office of Agricultural Water Policy (OAWP) has a decades-long collaboration in place with Florida's agricultural landowners and producers to implement BMPs for limiting runoff of

⁹ For example, under the draft HSF, the entire state of Florida falls within a PULA. Similarly, most of the agricultural production areas within the states of Georgia, South Carolina, North Carolina, and Alabama are also within a PULA. Correspondingly, nearly 90 percent of the total U.S. citrus production acreage is impacted/within PULAs. It is interesting to note that citrus groves in Florida have been sanctuaries for endangered/threatened species such as alligators, wood storks, Florida panthers, etc. for many decades without negative impacts.

¹⁰ It should be noted that the Agency's approach is not consistent with the approach used by the US Fish and Wildlife Service (FWS) in various final BiOps and ignores PULAs that have already been developed by the FWS.

¹¹ MCFA supports the recommendations of various stakeholders for the Agency to use the best available and most up to date species data, particularly refined PULAs that have been developed by the FWS, and use "interim" PULAs as described in those comments if no FWS PULA is available, rather than relying on listed species ranges. Tools are available to help facilitate species habitat mapping beyond simple range maps including Species Distribution Models (SDMs). For example, one registrant, Syngenta has partnered with Stone Environmental, Inc. in the creation of the Automated Probabilistic Co-Occurrence Assessment Tool (APCOAT), which is a freely available computer program (<https://www.stone-env.com/our-expertise/environmental-systems-modeling/apcoat>) that generates batches of probabilistic maps and statistical summaries of species distributions, pesticide use, and co-occurrence between the two. This tool was recently presented at the EPA's Environmental Modeling Public Meeting (EMPM, October 10, 2023).

pesticides, nutrients, and sediment, while protecting water resources. Such runoff elimination practices should also be considered applicable for protecting threatened and endangered species. FDACS OAWP can document that during 2022 nearly 425,000 acres of citrus crops are already enrolled in and following these runoff prevention BMPs, as are more than 1,000,000 acres of row/field/vegetable crops. Cumulatively, more than 1.8 million agricultural acres are enrolled in and adhering to Florida BMP programs.

There are various programs in other states similar to the California ILRP and Florida's OAWP BMPs. For the Agency's convenience, attached to these comments is an excel spreadsheet prepared by Syngenta that provides a non-exhaustive list of state programs agricultural runoff and erosion mitigation programs. (See Appendix II, Listing of State Mitigation Programs) The information is categorized into the following four areas:

1. Competitive Best Management Practices (BMP) Cost-Share (most common; local conservation district planning and BMP implementation);
2. State Regulatory (for states with regulatory statutes governing runoff and erosion from agricultural land and some system for enforcement/oversight);
3. State Certification Program (state approved certification programs that include runoff and erosion mitigation measures); and,
4. Nutrient Management (some states have nutrient management planning and mitigations that are relevant to runoff and erosion).

The Agency should review each of these programs and hopefully concur that if the programs are applicable to the region, site, and cropping system, and if growers are following the mandates of such programs, they qualify for the exemption. It is also recognized that some existing conservation programs are not designed to address pesticide runoff or erosion specifically or the geographic growing regions and crop diversity, so MCFA would like to engage with the Agency as it further develops the parameters associated with the exemption process. A viable exemption process can serve as a significant mechanism for reducing the potential burdens on the affected grower stakeholders. We also believe the involvement of the Agency with USDA's Office of Pest Management Policy (OPMP) as well as the National Association of State Departments of Agriculture (NASDA) would be very helpful in further developing the exemption process.

The Agency needs to reconsider its mitigation menu.

As noted above, for many specialty crop growers, the menu of mitigation options does not present practical or economically feasible choices. The Agency should reconsider some of the parameters of the existing potential mitigation measures as well as add to the menu of potential mitigation options. The mitigation point system needs to be reconsidered. There are growers who simply will not be able to meet the nine-point mitigation requirement. This will result in growers having to change their crop protection/weed management programs. Such changes may result in unintended consequences such as increase in weed resistance and could result in growers altering the crops grown. Crops with products triggering lower point requirements will become preferred options with the unintended consequence of altering U.S. food, fiber, and feed markets.

It should also be noted that under the current proposal, unless qualified under an exemption, many growers will need to significantly change their current operations to acquire enough points to use the “9” point herbicides. As drafted, it is difficult for growers to understand the full impact of the draft HSF, and the assigned point values for many herbicides are not identified. Not only is this information needed for a grower to determine if he can secure enough points via mitigations to use the most effective herbicide, but it is also a significant factor to growers when they are determining the chemical rotation for their resistance management plans. It also becomes a significant financial consideration in determining if the grower should invest additional funds into potential mitigations to be eligible to use a “9” mitigation point herbicide. Again, if these growers do not fall under an exemption, they will incur significant costs to changing their agricultural operations in trying to incorporate the handful of potential mitigations necessary to use herbicides requiring 9 mitigation points.

Regarding the existing mitigation measures, for example, only one point is to be awarded for a grower who farms on land with less than 2% slope. In previous comments to the Agency, MCFA stated that a field with a slope of 3% or less is essentially flat and serves as an effective mitigation measure to help preclude pesticide offsite movement through runoff or erosion. MCFA’s recommendation finds support in USDA NRCS. Specifically, NRCS identifies soils with a slope of 0 to 3% as essentially flat.¹² Based on this, MCFA recommends that EPA appropriately modify this potential mitigation option to reflect that farmland, which has a 3% or less slope, qualifies as a mitigation measure.

Other factors also need to be considered by the Agency. For example, the Agency’s approach to tailoring mitigation points should also reflect considerations such as the number of rainfall events. The fewer the rainfall events, the lower the risk of runoff or erosion. Similarly, the composition of various soils should be considered. Essentially the Agency should recognize that the existence of natural conditions can achieve results like those anticipated for the listed mitigations, thereby obviating, or reducing the need for additional mitigations.

Further, additional mitigation measures need to be added to the menu of mitigation options. This is expected to be an ongoing process. As a starting point, the comments submitted by the State FIFRA Issues Research and Evaluation Group (SFIREG) on the draft VSPP identifying additional mitigation measures should be considered for inclusion in the draft HSF.¹³

Other potential changes to the mitigation menu should include refinements in application rates, the use of dryland cropping, and the employment of wattles by growers. Specifically, regarding application rates, as currently proposed, awarding mitigation points for reduced rate applications potentially invites resistance development and could result in unintended consequences, including more frequent pesticide applications because of poor pest control.¹⁴ However,

¹² https://www.nrcs.usda.gov/sites/default/files/2022-10/Basic_Soils_AK_Curriculum%20-%20UPDATED.pdf

¹³ *SFIREG Comments regarding EPA’s Vulnerable Listed (Endangered and Threatened) Species Pilot Project: Proposed Mitigations, Implementation Plan, and Possible Expansion, Docket Number EPA-HQ-OPP-2023-0327, August 6, 2023.*

¹⁴ Reducing herbicide application rates also increases other associated risks such as:

- Crop yield and quality can be reduced by competition from weeds that survive low-rate application.

providing credit for reduced yearly rates brings significant benefit and reduced risk of runoff. Allowing for a full rate per application to achieve weed control helps limit herbicide resistance development, and awarding credit for fewer applications per year reduces the odds of offsite herbicide exposure from a significant rain event taking place soon after an application. For example, if a grower applies a herbicide two times in a given year rather than three, they have reduced the risk of an application and significant rain event coinciding by one-third.

Regarding dryland cropping, the draft HSF awards a point for irrigation water management “to control the volume and frequency of irrigation water applied to crops.” These irrigated crops also receive water through rainfall, which cannot be controlled from a volume or frequency perspective. A dryland farm has less water moving through fields and represents a low risk for pesticide runoff and erosion. Consequently, it is suggested that such a farming practice should be awarded at least two mitigation efficacy points. Without the acknowledgement of reduced risk of dryland farming, EPA will encourage growers to install irrigation systems where not needed, which could unnecessarily deplete groundwater¹⁵ and could reverse a nearly 40-year trend of reduced water use in agriculture, particularly in western agriculture¹⁶.

Wattles also should receive point(s) as an effective erosion and runoff mitigation. Straw wattles are designed to slow down, filter and trap sediment before the runoff gets into waterways, according to the California Stormwater BMP Handbook¹⁷.

The Agency needs to develop a substantial educational outreach program.

The Agency will need to engage in a substantial additional education outreach effort with the agricultural community on various aspects related to implementation of the draft HSF. For example, affected producers may need training regarding the various mitigation measures among which they are expected to select. How does the Agency intend to provide that training? Further, for the most part, the agricultural community has little/no familiarity with Bulletins Live! Two (BLT). Affected growers will need to be trained in how BLT operates as well as what records they need to maintain to address any questions that regulatory authorities might have regarding compliance with label requirements.

It is believed that it will take additional time to implement an appropriate herbicide labeling program that recognizes the importance of minimizing the disruption to the affected agricultural community. To that end, it is recommended that the Agency consult with the settling plaintiffs in the Mega-suit and seek additional time for finalizing the draft HSF. It is understandable that

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- Uncontrolled weeds mature to reproduction and form seeds (and/or vegetative tissue for perennials) that make future problems even worse, which might then require more inputs than originally anticipated. Moreover, weeds that survive sublethal injury to produce viable seeds start the selection pressure for herbicide-resistant plants.
 - An often-cited barrier to the implementation of herbicide use reduction strategies is that they may lead to increased weed densities requiring greater herbicide use in subsequent seasons. Additional herbicide applications or control measures may also be needed to manage weed escapes.

¹⁵ <https://www.nytimes.com/interactive/2023/08/28/climate/groundwater-drying-climate-change.html>

¹⁶ <https://www.ers.usda.gov/topics/farm-practices-management/irrigation-water-use/>

¹⁷ https://www.rcdsantacruz.org/images/brochures/pdf/Straw_Wattle_Installation_Guidelines.pdf

the Agency is reluctant to do so, particularly since the settlement agreement was finalized in September. However, it is not clear that the scope of the effort involved in developing and then implementing such a strategy was appreciated by the parties to be as daunting as it has turned out to be. Clearly if they are objective in analyzing the situation, those settling plaintiffs must be satisfied that the Agency is committed to addressing its ESA responsibilities. It simply will take some additional time to develop a more robust approach, one that minimizes the disruption to the agricultural community and is appropriately narrowed to target instances where additional protections to listed species populations is needed.

Conclusion

In summary, the draft HSF has the potential to significantly burden growers who use these products. MCFA continues to believe the Agency has a responsibility to conduct the appropriate analysis based on the best available scientific and commercial information to determine whether additional labeling measures are needed regarding the use of herbicides, i.e., whether such measures are necessary to assure that the pesticide use is not likely to jeopardize the existence of listed species or adversely modify its critical habitat. While this is clearly difficult and time consuming to do, once done it can lead to a program that is more rationally based. MCFA continues to want to engage with the Agency in a constructive manner as it moves forward. If the Agency would find it helpful, MCFA would like to discuss sponsoring a workshop that would hopefully include in addition to EPA, USDA, and the Services to further examine the mitigation process and issues.

Respectfully submitted,



Michael J. Aerts
Co-Chair; MCFA Technical Committee

On Behalf of:

Almond Board of California
American Farm Bureau Federation
American Horticultural Society
AmericanHort
American Pistachios
American Seed Trade Association
California Apple Commission
California Association of Winegrape Growers
California Avocado Commission
California Citrus Quality Council
California Fresh Fruit Association
California Garlic and Onion Research Committee
California Prune Board
California Specialty Crops Council
California Walnut Commission
California Sustainable Winegrowing Alliance
California Wine Institute

Certified American Grown
Cherry Marketing Institute
Colorado Potato Legislative Association
Consolidated Central Valley Table Grape Pest Control District
Cranberry Institute
Empire State Potato Growers
Florida Citrus Mutual
Florida Fruit and Vegetable Association
Florida Nursery, Growers & Landscape Association
Florida Strawberry Growers Association
Florida Tomato Exchange
Georgia Fruit and Vegetable Growers Association
Idaho Potato Commission
International Fresh Produce Association
Lodi District Grape Growers Association
Maine Potato Board
Massachusetts Nursery and Landscape Association
Michigan Corn
Michigan Farm Bureau
Michigan Vegetable Council
Monterey County Vintners and Growers Association
National Association of Landscape Professionals
National Onion Association
National Potato Council
North Carolina Potato Association
Northland Potato Growers Association
Northwest Horticultural Council
Oregon Association of Nurseries
Oregon Potato Commission
Paso Robles Wine Country Alliance
Pennsylvania Cooperative Potato Growers
Potato Growers of Michigan
Santa Barbra County Vintners Association
Society of American Florists
Texas Citrus Mutual
US Apple Association
US Potatoes
USA Cherries
USA Dry Pea & Lentil Council
Washington Hop Commission
Washington State Potato Commission
Washington Wine Grape Growers Association
Western Growers
Wild Blueberry Commission of Maine
Wisconsin Potato & Vegetable Growers Association

APPENDIX I FEASIBILITY OF MITIGATION OPTIONS

CALIFORNIA FRUITS AND VEGETABLES

1. Rate reductions

In California (“CA”), the viability of this mitigation measure and thus the ability to receive mitigation points for it, is very dependent on the crops being grown. In orchard/vineyard crops, it is rare that the whole floor of the field is treated at one time. It is more common that strip applications are applied down the tree/vine row to keep that area clean. In the drive row, “native” vegetation (i.e., weeds) or planted cover crops may be present during the winter months with winter rains. That area will be managed with a combination of herbicides and mowing. Once the dry season starts, weeds are less common, resulting in growers applying more herbicide strip/spot treatments. In vegetable production, practices vary considerably, and may involve the need to use full label rates of herbicides to “clean up” the fields prior to the next planting. However, spot treatments may also be applied.

2. Vegetative filter strips (on-field)

Most of the specialty crop acreage in CA, particularly in the Central Valley and Desert regions, is set up on flat (less than 3% slope) fields that do not have any runoff. Many areas in CA also are set up on permanent micro-irrigation systems (drip or micro-sprinklers). Micro-irrigation systems should be considered a mitigation, as there is no runoff or erosion with these systems. With micro-irrigation systems, the driplines or micro-sprinklers are situated within the tree rows, and water does not reach across the whole surface of the orchard or field. Consequently, it would be very difficult to maintain cover crops/vegetative filter strips once the rainy season is over. Also, there would be additional costs incurred to modify these systems to accommodate watering vegetative filter strips. Specialty crops are very high value crops and land rents tend to be very high. It is not economically feasible to set aside land for vegetative filter strips for specialty crops already operating on relatively thin margins. Further, many orchard crops are set up with underground piping that brings water to each crop row. Modification of these systems also would be expensive. Additionally, since these systems provide deep penetration irrigations, irrigation schedules can be as infrequent as every 10 to 14 days, which may not be tolerable to the vegetative strips. Further, once crops are harvested, irrigation schedules often become more infrequent until fall. Installing vegetative strips will also reduce productive acreage, which will lower the yield per acre and increase the cost per acre of production.

For crops grown in more hilly areas, vegetative filter strips downslope may be feasible during the winter months when vegetation can grow relying on rain. During the dry season, such strips are not necessary or practical.

Another concern in CA is the lack of water for agriculture. Maintaining a vegetative filter strip outside of the rainy season would require including both irrigation infrastructure and applications of valuable water for non-productive uses. With this in mind, most growers use herbicides to keep all non-crop row areas clean and free from vegetation, as this would become a source of competition for the expensive available water if the vegetation were allowed to exist. Also, when the soil is dry, it should not be a concern for runoff. There are very few times when soil in

CA reaches a saturation level, especially in season.

The CA specialty crop industry currently doesn't know which plants to use or what impact vegetative filter strips would have on integrated pest management ("IPM") since the strips could harbor harmful insects, beneficial insects, rodents, or other pests. The vegetation filter strips could become a habitat for the very pests that growers are trying to eliminate from their fields for food safety reasons. It is likely that pests such as vertebrate pests, lygus bug, grasshoppers, katydids, beetles, etc. will move into these strips and then move into the grower's crop for their food source. This in turn will increase the need by the grower to apply more pesticides to control these new pests that would not have been present if the vegetative filter strips were not developed on the grower's acreage. These strips can also harbor insects, which may be vectors for diseases, and thus serve as a source of reinfestation and inoculum, requiring subsequent applications, thus increasing costs. Add to this the unknown effect on the grower's IPM plan for control of pests, and then the potential for additional pest resistance developing. In the leafy greens sector, they are advised by food safety experts to keep the edges of their field clean and free of vegetative matter to avoid or minimize any food safety issues. Most growers will not be able to realize any "points" for this mitigation.

3. Grassed Waterways (on-field and off-field)

The majority of CA specialty crop acreage is situated on flat or very slight sloping terrain. There would be no need to implement such radical measures to contain water or soil runoff. These would not be easily attainable in CA, where there is a long dry season. Additionally, orchards are permanent features that cannot be reengineered without making production completely infeasible. Also, many other acres of other crops are set up with permanent irrigation systems, such as lettuce, peppers, and artichokes, which cannot be reengineered easily. Thus, most growers will not attain points for this development.

4. Field Border (off-field)

Most of the specialty crop acreage in CA, particularly in the Central Valley and Desert regions, essentially has no slope (3% or less). Currently, most new plantings of almost any crop are laser leveled and the drop from one end of the field to the other over a quarter mile length is 1 to 2 inches. With this practice water does not run off the acreage, but instead soaks into the soil.

Regarding establishing a 30-foot-wide field border, this would require most growers to remove a significant amount of land that is in production, thus creating a significant economic impact for them. Specialty crops are very high value crops and land rents tend to be very high. It is not economically feasible to simply add additional costs in establishing field borders (off-field).

A major concern in CA is the lack of water for agriculture. Maintaining a vegetative filter strip outside of the rainy season would require including both irrigation infrastructure and applications of valuable water for non-productive uses. Also, please see the above comments about the detrimental impacts such a mitigation would have on integrated pest management and resistance programs as well as food safety programs. In the CA lettuce industry, the vegetative areas are likely to harbor animals or rodents that can conflict with the food safety regulations that are in place for their crops, and other crops as well. Again, establishing a border off field creates a habitat area for pests that could then venture into the grower's field and cause crop damage. This

would not only create the need to apply more pesticides to control pests, but it would also render the damaged crops unmarketable. These off-field borders can also harbor insects, which may be vectors for diseases, and thus serve as a source of reinfestation and inoculum, requiring subsequent applications, thus increasing costs. They also could impact the ability of commodities intended for export being able to comply with export protocols established by an importing country for the management practices to be employed in the growing phase of the crop, such as when clean field borders are specified in the protocol, which is designed to minimize pests in the acreage being farmed. Most growers will not obtain any points with this mitigation.

Imposing mitigation requirements such as field borders can also cause significant unintended consequences. A simple outcome of field border implementation involves the potential makeup of plant species found within these field border areas. These plants will likely include multiple species of weeds. Over time, field borders develop dense and persistent infestations of common and noxious weeds.

An example of such a weed taking hold in field border areas is branched broomrape. Branched broomrape is a parasitic weed that causes devastating damage to many economically important specialty crops such as tomato, cabbage, potato, eggplant, carrot, pepper, beans, and celery. This weed utilizes a modified root to fuse into a host plant root and extract nutrients and water, greatly reducing productivity, and eventually leading to the death of the host plant.

Broomrape is an especially significant concern for crops such as processing tomatoes in CA, an area that produces more than 90 percent of the nation's processing tomato crop. Broomrape can thrive in these field border areas because of the commonly practiced, economical-driven maintenance habits associated with field border areas. Broomrape is currently classified in CA as an "A" pest, that is, "an organism of known economic importance subject to California State enforced action involving: eradication, quarantine regulation, containment, rejection, or other holding action." As a severe economic pest and a CA "A-list" weed, establishment and spread of a branched broomrape could cause severe consequences for individual growers and for the entire CA processing tomato industry. Currently, discovery of broomrape in a commercial tomato field leads to a hold order and crop destruction, without harvest.

In processing tomato fields, parasitic broomrape causes significant yield losses of up to 40 percent. Because of its presence, broomrape can also cause loss of export markets, both domestically and overseas.

Within production fields, carefully timed herbicide treatments, along with other cultural treatments, can reduce yield losses caused by branched broomrape. However, establishing buffer zones and off-field vegetated areas adjacent to these processing tomato fields could perennially harbor broomrape plants and seeds. Because of its seed longevity characteristics, broomrape can have seeds persist in the soil for more than 20 years. This makes eradication particularly challenging. Additionally, the difficulty of using conventional means of weed control, such as cultivation and contact herbicides, is typically not applicable in large part because so much of the plant's lifespan occurs underground. Also impactful to the challenges of managing this noxious

weed is the lack of alternative chemical management tools (e.g., herbicides known to be effective in controlling broomrape) because they are not yet tested or registered in CA.

5. Cover Crop (on-field)

This practice is used in some areas of CA, mostly by some of the row crop growers who produce a cyclic turnover of winter wheat/barley and field corn. In orchard and vineyard crops, winter cover crops in the drive rows are used, particularly in the northern half of the state that receives more winter rainfall, thereby promoting the growth of native/seeded vegetation as cover crops. The tree/vine rows are typically clean and free of vegetation year-round for pest management and irrigation management reasons. Once irrigation water is needed to maintain the crop, growers want the entire floor clean to avoid competition for the expensive, limited water supply. Also, this is impractical for many other specialty crops in CA such as lettuce, carrots, peppers, melons, garlic, onions, and artichokes. Lettuce acreage is constantly being replanted to other rotational crops just as soon as one is harvested. Likewise for carrots and peppers. Onions and garlic are planted in the fall and harvested in the late spring through summer. As soon as the crop is harvested the soil is prepared for the next planting. As previously described above, there is a concern of non-crop vegetation competing with the crop for the available water. Further, some cover crops can provide habitat for pests such as vertebrate pests, lygus bugs, grasshoppers, katydids, beetles, etc. They can also harbor insects, which may be vectors for diseases, and thus serve as a source of reinfestation and inoculum, requiring subsequent pesticide applications, thus increasing costs. They can also harbor insects, which may be vectors for diseases, and thus serve as a source of reinfestation and inoculum, requiring subsequent pesticide applications, thus increasing costs. This would disrupt IPM and resistance management efforts and result in more pesticide use to gain control. Some organic growers do use cover crops but not on a large scale and it is crop dependent. Thus, only a few growers will earn points for this practice.

6. Contour Buffer Strips (on-field)

This is not feasible on most acreage in CA because of the flatness of the growing acreage. This might be potentially doable in the Coast range and foothills of the Sierra, especially in the northeastern areas of the Sacramento Valley or Coastal areas. There is concern about available water for the strips. Again, in the late spring to early fall, there will be a problem with irrigation of the buffer area. Most growers will not get points for this mitigation.

7. Contour Farming (on-field)

The majority of California acreage is situated on flat or very slightly sloping terrain. There would be no need to implement such radical measures to contain water or soil runoff. Additionally, orchards are permanent features that cannot be reengineered without making production completely infeasible. Again, no points for most growers.

8. Contour Strip Cropping (on-field)

The majority of California acreage is situated on flat or very slightly sloping terrain. There would be no need to implement such radical measures to contain water or soil runoff on most of this acreage. Additionally, orchards and many other commodity acreages are permanent features

that cannot be reengineered without making production completely infeasible. This would also be difficult given the need for equipment to get through for harvest and other cultural needs.

9. Terrace Farming (on-field)

The majority of California acreage is situated on flat or very slightly sloping terrain. There would be no need to implement such radical measures to contain water or soil runoff on most of this acreage. Additionally, orchards and many other commodity acreages are permanent features that cannot be reengineered without making production completely infeasible. This would also be difficult given the need for equipment to get through for harvest and other cultural needs. Only a few growers would qualify for points for this mitigation.

10. Strip Cropping

This mitigation would be inappropriate and impractical for orchards and many row crop acreages because production activities must be performed seasonally throughout the production cycle and equipment must be moved between the rows of trees or crop. This is also incompatible with the standard methods for planting arrangements for many crops in CA including peppers, garlic, onions, lettuce, carrots, melons, and artichokes. Financial returns on specialty crops in CA are at or just above being profitable. To remove 50% of the specialty crop from a specific acreage would be financially infeasible, let alone the complications from trying to provide a wide array of crop care materials on several crops grown on the same acreage. In general, CA growers will not score points with this practice.

11. No Tillage/Reduced Tillage (on-field)

No Till/strip till: This practice is rarely employed in CA. Almost all row crop fields are disced and prepared for planting. Once planted, herbicides are used to remove all unwanted vegetation as this is a competition for the available water for the crop and can harbor unwanted pests, such as lygus bugs, katydids, grasshoppers, beetles, etc. For some orchard crops they do practice no-tillage, the entire orchard floor is treated with herbicides to remove any vegetation, again because of competition with the crop for water and so as not to harbor pests.

Strip till: See above response above for no tillage/reduced tillage. This is very uncommon in CA.

Ridge-till: See above response above for no tillage/reduced tillage. This is very uncommon in CA for the reasons cited above.

Mulch-till: There are some orchards in CA that use a mulch till of the tree vegetative matter that is pruned off in the winter, but this practice includes herbicide treatments so no unwanted vegetation will grow in the orchard, for the reasons explained above. Only a few growers do these practices and will be able to get the points.

12. Vegetative Barriers (on-field)

Since most acreage in CA is on flat ground there is no contour of fields. Again, vegetative rows are not normal, as they would most likely would require an independent water source, as the normal irrigation sources may not be compatible with the requirements of the vegetative strip, it may not be feasible to water from the flood irrigation that is practiced in many areas nor from the

drip irrigation that is set up in many orchards. Again, this vegetative strip would compete with the crop for the limited amount of water available and would also become a haven for unwanted pests, including vertebrated pests, lygus bugs, katydids, grasshoppers, beetles, etc. They can also harbor insects, which may be vectors for diseases, and thus serve as a source of reinfestation and inoculum, requiring subsequent applications, thus increasing costs. In the leafy greens sector, they are advised by food safety experts to keep the edges of their field clean and free of vegetative matter to avoid or minimize any food safety issues. As discussed for the other vegetative barriers, this is not feasible for most growers.

13. **Vegetated Ditch Banks**

In CA where crops are grown in hillier landscapes such as the coast, coast range, foothills, and where runoff/erosion may be of concern, then forms of vegetative strips or ditches may be possible (assuming there is room for them). Also, as noted above, most of the acreage is flat and the vegetation would be maintained by rainfall, not irrigation. Therefore, only a few growers will achieve points.

14. **Riparian buffers (herbaceous and forest buffers)**

It is rare for acreage in CA to be adjacent to an aquatic habitat. When this happens there usually is already some type of vegetative buffer in place, but it may not meet the specifications for this mitigation. Only a few growers may be able to get points for this practice as most growers are not near riparian buffers.

15. **Management of Surface and Subsurface Water on the Field**

-Subsurface drainage: This is a practice where an underground pipe is installed to collect and move excess water from a field.

Since runoff from flat acreage is not normal during the growing season, there are very few basins in CA. In some areas of CA, they used to have underground pipes to collect water from the acreage, but generally this was done to prevent salt intrusion from being flushed into the underground water systems, not for runoff control. For the last 20 to 30 years this has become a very uncommon practice since the droughts have modified the water intrusion events. There are still a few of these systems in place, mostly in the Coachella Valley and a small area near Salinas. Again, where present, they serve to divert salts from intrusion into the underground water systems or to remove water above an area of clay hardpan, which is not easily penetrated by water. Only a few growers will get points for this setup.

-Tailwater recovery systems: These systems are intended to collect, move, and temporarily store runoff water so that it can be reused later.

The use of tailwater recovery systems varies by crop and region of CA. In some crops and regions, it is an extremely rare system, while it is more common for some crops and regions of CA. Again, because of the flat acreage with basically no runoff, and the increasing use of micro-irrigation/subsurface irrigation systems in CA, there has generally been no need for these systems.

-Maintenance of basins and ponds must include the following: ensuring a healthy vegetative surface to maintain the structural integrity of the basin/pond; inspections after major storms, repair to damaged areas, and removal of any obstructions that interfere with flow around inlets, and removal and redistribution of excess sediment back to the field.

This type of water management is very rare on flat acreage but may be more common in the foothills or areas that are designated as prone to runoff in the Irrigated Lands Regulatory Program. Water and sediment control basins are generally not necessary in the flat production areas of the Central Valley. Some growers will be able to accumulate points for these mitigations.

16. Mulching with Natural Materials

Mulching with materials brought into an orchard or field is not common. There is a mulching of vegetative material pruned off trees in orchards (if the tree is pruned) and that material is shredded up so it will decay in the orchard soil. Even in the fall when the leaves drop, they decompose quickly. Most likely this shredding of brush in an orchard would not measure 2 inches deep and it is not held in place. Most growers will keep the orchard free of vegetation growth with herbicides or it may be cultivated into the soil as a soil fertilization supplement. When orchards are removed from production, it is now a common practice to shred those trees. The shredded matter is either removed to cogeneration plants or left in the field for the grower to incorporate back into the orchard soil. Most growers will not be able to obtain points for this practice. Growers not currently mulching with natural materials but who may need to resort to this mitigation to secure needed points for herbicide use, would incur increased costs to utilize this mitigation.

17. Alley Cropping

By the very definition of this practice, it implies it is on hilly terrain, not flat acreage. Again, most of the acreage in California is flat with no runoff issues. The vegetation for the alleys will become a competition with the crop for limited water and creates habitat for the very pests that the grower is trying to keep out/off the acreage being farmed. These pests could be vertebrates, lygus bugs, katydids, grasshoppers, beetles, etc. They can also harbor insects, which may be vectors for diseases, and thus serve as a source of reinfestation and inoculum, requiring subsequent applications, thus increasing costs. Also, this mitigation would be inappropriate and impractical for orchards because production activities must be performed seasonally throughout the production cycle and equipment must be moved between the rows of trees. CA growers will not realize any points for this practice.

As discussed above, there are fewer mitigation measures listed in the menu of mitigations that are feasible for many of the CA growers, especially the tree and vegetable crop producers. This means it will be more difficult for these growers to identify mitigations measures that are not costly or burdensome to implement. Under the current proposal, many CA growers will need to significantly change their current operations to acquire enough points to use the “higher rated” herbicides.

CALIFORNIA WINE GRAPE PRODUCTION

Scenario 1: Irrigated wine grape in California.

This region is west of the Sierra Nevada Mountains (not “Western Agriculture”). Slope varies greatly with some production on flat valleys while other production is on hillside slopes. Most soils are not sandy.

Contour farming is not typical.

Unless instructed on the label, soil incorporation of herbicides is avoided as watering-in would be considered a superfluous use of precious water resources and discing encourages erosion and runoff. As a perennial crop, often with decades old plantings, every effort is made to avoid disturbing the immediate and surrounding root structure of the crop rows.

Some producers plant, maintain and mow row centers, leaving the residue in the field. In scenarios 10 and 11 of the “Application of EPA’s Draft herbicide Strategy Framework Through Scenarios that Represent Crop Production Systems,” this practice appears to be given credit under “contour farming with strips” and on “nearly flat” land, described by NRCS as 0-3%, we assume it is given credit under “in-field vegetative filter strips.” However, it is unclear why this production practice is not given credit under “residue tillage management” and “cover crop.” Maintaining the perennial crop row and vegetated middles provides year-round field coverage and creates minimal disturbance to the soil, which fits the intended purpose of both practices. EPA should award this credit.

Most production is on drip irrigation and some producers do apply mulch.

Vegetated ditches are common in CA, as many areas do not allow water retention systems. However, these ditches are typically controlled by the state and referred to as blue line streams¹⁸.

Wattles are common tool for erosion prevention and reduced runoff in California vineyards. Straw wattles are designed to slow down, filter and trap sediment before the runoff gets into waterways, according to the California Stormwater BMP Handbook¹⁹. Wattles should receive point(s) as an erosion and runoff mitigation²⁰.

¹⁸ <https://www.countyofnapa.org/DocumentCenter/View/16620/Water-Quality-and-Tree-Protection-Ordinance-Implementation-Guide>

¹⁹ https://www.rcdsantacruz.org/images/brochures/pdf/Straw_Wattle_Installation_Guidelines.pdf

²⁰ <https://forest.moscowfl.wsu.edu/engr/library/Robichaud/Robichaud2005n/2005n.pdf>



Wattles in CA wine grape production

<u>Practice</u>	<u>Frequency</u>	
<2%	Some	1
Cover crop	Some	*
Contour farming with strips (slope)	Some	3
In-field vegetative filter strips (flat)	Some	3
Residue tillage management	Some	*
Irrigation water management	Frequent	1
Mulch amendments	Some	3
Vegetated ditch	Frequent	1
Multiple categories	Some	1
Wattles	Frequent on slopes	?
Total of 2 to 10 points		

* Despite maintaining a perennial crop and vegetated row middles, these growers are not currently credited for “cover crop” and “residue tillage management.”

FLORIDA

The first mitigation measure involves herbicide application parameters; more specifically, herbicide rate reductions. A 10 percent rate reduction equates to gaining 1 mitigation point; a 20 percent rate reduction equates to gaining 2 mitigation points, etc. While herbicide rate reductions may seem like a good idea, in a subtropical climate geographical area such as Florida, weed proliferation rates are exceedingly excessive and near maximum use rates are a necessity if acceptable management is to be realized. Florida produces its vegetable and citrus crops (other than oranges) purely with the intention for distribution within the fresh market system. This demands that commodities are of top quality, aesthetically perfect, 100 percent blemish-free, and completely free of other imperfections such as plant (weed) trash. This can be difficult to achieve, especially under Florida’s subtropical environmental growing conditions that are so conducive to germination and prolific growth of problematic weed populations that can get out of hand in rapid fashion if left even partially unchecked.

Florida's specialty crop production industries are dependent on excellent weed management for various reasons including:

- Crops experience yield losses because of weed competition for nutrients, water, and light.
- Weeds often serve as alternate hosts for pests such as insects and nematodes.
- The presence of weeds often interferes with the application of fungicides and insecticides by intercepting the spray before it reaches the intended target site.
- Harvesting of crops is impeded by weeds that obscure the harvester's accessibility to the fruit.
- The inability to manage weeds adequately in one year allows the development of many millions of seeds that creates a severe weed problem to battle for at least the next 10 years.

The goal is to get the most control out of the herbicide to avoid the need for sequential applications. Using low herbicide doses has been shown to result in increased weed survival allowing for the development of resistance of multiple species of weeds. Herbicides rarely work on all species. Even broad-spectrum/non-selective herbicides do not kill all species. Many perennial weeds also have extensive root systems and underground reproductive organs. Even when applying at the full labeled rate, a single herbicide application in most cases will not kill all plant organs, enabling these weeds to recover.

Vegetable crops have far fewer herbicide-resistant weeds than numerous other crops. Many reasons for this phenomenon exist, including:

- The limited number of herbicide applications in specialty crops in the past,
- The overall low acreage of specialty crops comparatively, and thus overall lower population exposure to the herbicide,
- The use of full-labeled rates of herbicides,
- The use of fumigants and plastic mulches,
- Intensive cultivation, and,
- The occasional use of hand weeding to remove survivors.

The loss of methyl bromide has also led to an increased reliance on herbicides in many vegetable crop fields because most of the registered fumigant alternatives do not adequately control weeds like methyl bromide did.

Also complicating the situation in Florida is the fact that many of the state's specialty crops are exclusively produced on high organic matter or muck soils. Weed control is complicated further because the activity of preemergence herbicides in particular is very often reduced by the increased organic matter content of those soils. The high organic matter/muck soils bind up the herbicide molecule more efficiently and decompose/deactivate the herbicide molecule much more rapidly. While lower than maximum use rates may be used legally, the applicator must weigh the fact that especially on muck soils, lower herbicide application rates generally lead to reduced efficacy and yield reductions.

Ultimately, an increased rate of development of herbicide resistance within specialty crop fields may be an unintended consequence of implementing herbicide use rate reductions. This makes the ability to utilize mitigation “points” under this section essentially unattainable, as specialty crop growers in Florida need/typically apply the necessary full recommended use rates.

The second mitigation “point” opportunity within the draft HSF’s Table 6-9 involves soil incorporation of the herbicide within a few hours of application. Incorporation can be by watering-in or via discing. It must be pointed out that specialty crop farmers typically apply herbicides only in a banding-like manner. They do not make the fence-to-fence herbicide applications like many of the major row crop sectors. Herbicide applications are typically only made to the areas that are between the rows of the actual crop being produced, or if a tree crop is involved, herbicide applications are only made to the area directly underneath the drip line of the tree.

Florida’s specialty crops, like many specialty crops across the country, are prohibited by FDA from using overhead irrigation in fields because of food safety concerns resulting from the overhead irrigation water coming into direct contact with the edible portion of the plant. This prohibition includes not using overhead irrigation to water-in herbicides when the crops are in the field. Consequently, watering-in is not an option for these specialty crop growers, because of these pre-existing FDA-mandated Food Safety Modernization Act (FSMA) requirements.

In other areas of Florida, specialty crop production depends on seepage irrigation for the water necessary to grow the crop. Water distribution from seepage irrigation systems occurs below the soil surface. For more than half a century, seepage irrigation has been the predominant irrigation practice in numerous fruit and vegetable production areas in Florida. In areas that have a high-water table resulting from the presence of a shallow impermeable soil layer, fruit and vegetable crops have been intensively grown with seepage irrigation by adjusting the underground water table level. Seepage irrigation is primarily the result of upward movement of water from the artificially elevated level of the water table. Seepage irrigation is the most common irrigation method in south Florida for muck and sandy soils. The top of the water table is typically maintained between 18 and 24 inches below the surface of the soil, and this is the water that the crops have access to for irrigation purposes.

For seepage irrigation systems, water is moved underground horizontally from the source and then vertically via capillary action to the plants at rates that depend on the soil’s hydraulic properties. Nonuniformity in water table heights results in nonuniform production since water moves up into the crop root zone by the soil capillarity action. Consequently, watering-in is not an option for fields set up to use seepage irrigation for watering purposes.

Similarly, as previously mentioned, herbicides are typically only applied to row middles in Florida’s vegetable and strawberry systems, as these systems utilize the raised bed plastic mulch production techniques. Once the plastic is laid, no additional cultivation of any type occurs through to the end of the season, as cultivation activities could destroy or at the very least damage the plastic mulch plant beds. So, incorporation via watering-in or via discing is simply not a possible scenario in Florida’s specialty crop production systems.

Where seepage irrigation is used, because of the presence of this shallow impermeable layer and elevated water table, most of Florida will also therefore not qualify for a mitigation “point” where the production area has predominantly sand, loamy sand, or sandy loam soil *without* a restrictive layer that impedes the movement of water through the soil.

The third opportunity for mitigation “points” involves incorporation of contour farming. Florida is geographically flat. Slopes within fields are less than 2 percent, and therefore the likelihood of any significant herbicide runoff from operations on such land is minimal. Therefore, much like the previous “point” options, contour farming is not possible in Florida’s specialty crop production systems.

The fourth opportunity for mitigation “points” involves use of cover crop/continuous cropping practices. Certain specialty crop sectors in Florida do implement traditional cover cropping during the fallow months of summer (which is countercyclical to the rest of the country). However, other specialty crop sectors in the state essentially cover crop their specialty crop fields with water during the summer, for multiple reasons. To maintain soil characteristics and soil physiological properties, water must cover the surface area for months at a time to limit the amount of oxygen reaching the soil, as soil oxygenation leads to soil breakdown and soil subsidence. Flooding these fields also provides certain pest management benefits, as the water within these summer flooded fields literally drowns soilborne pests such as wireworms, grubs, and nematodes over time. Planting a cover crop within fields that would otherwise be flooded would involve more economic investment, cost more money, and it would maintain pest levels at problematic levels when approaching subsequent production cycles.

The fifth opportunity for mitigation “points” involves grassed waterways. Grassed waterways do not occur within Florida’s vegetable production systems, nor can they occur within these systems, purely from the field design standpoints.

Grassed waterways are, however, present between each row of trees within Florida’s flatwoods citrus production areas. Prior to planting, lands are intentionally manipulated so that primary root growing regions are in an elevated area, while areas between every-other row of trees are intentionally “dug out” to create a depressed area between the rows, to hold and/or intentionally move water. These depressed areas between every other row allow the tree roots to avoid oversaturated growing conditions where roots are present. In these flatwoods citrus production areas, trees are planted on double row raised beds. The crown of raised beds is approximately 3 to 4 feet above the bottom of the furrow. Areas between the dripline of each row is made up of a solid and maintained vegetative strip. These water/sediment management systems within citrus flatwoods production areas are designed to be able to handle approximately 4 inches of rainfall water per day, keeping tree roots in a favorable growing situation from a moisture standpoint. In the sandy soil citrus growing areas of the central part of Florida, however, downward drainage of water is usually adequate because of the high sand content in these soils, and groves in the central part of Florida do not require bedding or additional drainage measures. Overall, because of the implementation of these management systems, excessive and undesirable water runoff/soil erosion therefore does not/cannot occur. Consequently, with respect to this opportunity, flatwoods citrus production could secure a mitigation point, but sandland citrus and vegetable production overall could not.

The sixth opportunity for mitigation “points” involves in-field vegetative filter strips. Vegetative filter strips within citrus groves would appear to be a potential mitigation measure that citrus growers could implement and secure one point. However, since the vegetable production acreage in Florida is on flat ground, no contour to the fields exists. Vegetative rows within vegetable production fields therefore are not normal, nor possible. Also, the normal irrigation sources may not be compatible with the requirements of the vegetative strip, and it is not feasible to water the vegetative strips between the rows of trees using the microjet irrigation system that is incorporated into Florida’s citrus groves. Additionally, vegetative strips compete with the crop for the water resources and could also be a haven for unwanted pests, including vertebrate pest.

Vegetation strips could be particularly disruptive from a human food safety perspective for some specialty crop growers such as those in vegetable production industries. Vegetative areas are likely to harbor animals or rodents that can conflict with FDA food safety efforts and regulations (FSMA) that are already in place for farmers’ crops. The filter strips create a habitat area for pests that will potentially venture into the grower’s field and adversely affect the marketability of the crop. This “points” opportunity for in-field vegetative strips could be beneficial to those making herbicide applications to citrus in Florida, but no other production sector could realize such points benefits.

The seventh mitigation “points” opportunity involves irrigation water management. Florida growers already do manage their irrigation waters, as mentioned previously, so obtaining one point for this existing practice should be possible.

The eighth opportunity for mitigation “points” involves applying mulch amendments with natural materials. Mulching with materials brought into a specialty crop fields/citrus groves is not common whatsoever. A somewhat mulching effect from vegetative materials pruned from citrus trees in groves might occur, as that material is shredded so the brush decays within the grove. When the leaves drop, they decompose quickly. This shredding of brush in a grove certainly would not measure 2 inches deep, and it is not held in place. Therefore, this tactic would not appear to meet the proposed minimum requirements.

The ninth mitigation “points” opportunity involves residue tillage management (no till/reduced tillage). This practice is not practical for perennial crop systems nor is it practical for annual vegetable production sectors in Florida. All vegetable fields in Florida are disced as a basic part of planting preparation. Fields must start with a clean area for planting, completely free from weed pests if possible. Once planted, herbicides are used in these fields to remove all unwanted vegetation that competes for the available water/nutrients for the crop and can harbor unwanted pests.

The tenth opportunity for mitigation “points” involves terrace farming. See the comments above relating to contour farming. As previously noted, Florida’s specialty crop fields are relatively flat. Terrace farming would require a wholesale change for many specialty crop producers. New plantings are often laser leveled, and the drop from one end of the field to the other end of the field that is a quarter of a mile away is 1 to 2 inches. With this configuration, these fields do not represent a significant threat to transport herbicide residues through surface water runoff. Water

will not runoff these acreages. Instead, it soaks into the soil. Putting in terraces to create flat crop areas would appear to be incredibly radical and make no sense for lands that already are flat. Additionally, production systems such as citrus groves are permanent features that cannot be reengineered without making production completely infeasible.

The eleventh mitigation “points” opportunity involves riparian areas. A distinct lack of science-based information regarding the establishment and management of upland riparian buffers in proximity to most of specialty crop agriculture exists. If EPA is to focus on the use of riparian buffers for ecological mitigation considerations, science-based, peer-reviewed information on quantity and mode (surface, subsurface, and groundwater) of runoff and sediment movement to water bodies requires a serious need of investment in research, and outreach from local experts in best utilizing these buffers is an absolute necessity. Growers do not have the necessary tools and knowledge to properly implement these buffers, and there is little understanding of the economic impacts of implementing this mitigation tactic.

The twelfth mitigation “points” opportunity involves incorporation of vegetated ditches. While vegetated/grassed ditch banks are possible, often having vegetated ditch banks becomes a flagged offence during food safety audits conducted by FDA or retailer buyers. For mammal, reptile, and amphibian management, FDA and retail auditors will cite farms that use vegetated/grassed ditch banks, because any such vegetative or grassed ditch banks can harbor and/or provide cover for numerous species of mammals, reptiles, and amphibians that are associated with and can transmit microbial diseases and pathogens. FDA and retail buyers of specialty crops prefer to have crops grown in areas that are clean, with completely vegetation free ditch banks.

The thirteenth opportunity for mitigation “points” involves use of 30-foot vegetative filter strips adjacent to the field. As noted above, Florida’s specialty crop fields are relatively flat. New plantings are typically laser leveled, and the drop from one end of the field to the other end of the field that is more than a quarter of a mile, is 1 to 2 inches. With this configuration, these fields do not represent a significant threat to transport herbicide residues through surface water runoff. Water will not runoff the acreage. Instead, it soaks into the soil. Little need exists for taking cropland away to create a field border of permanent vegetation under such circumstance.

Also, could EPA provide the basis for establishing the minimum buffer width at 30 feet? Establishing a 30-foot minimum border can involve taking a significant amount of land out of production. This size buffer could be particularly significant for smaller specialty crop growers where the loss of production area will impact them particularly hard from an economic perspective.

The final opportunity for mitigation “points” involves application areas where the slope is less than 2 percent. Florida growers will qualify for this point.

Ultimately then, from a typical, summation perspective in Florida, given the mitigation “point” parameters described in the draft HSF, an average specialty crop grower in Florida can be expected to attain at most only a total of 4 to 5 mitigation points. It makes use of any herbicide requiring more than 5 points very problematic.

TEXAS

Citrus production in the Rio Grande Valley, Texas

Scenario: Citrus orchards in Rio Grande Valley of South Texas, micro-sprinkler and flood irrigated, East of Route 35.

Flood irrigation management is used on level soils where irrigation is turned on, allowed to soak into soils and then turned off.

Interstate 35 is 1568 miles long and the Rio Grande Valley is west of all but the southernmost 236 miles and for this reason would not be considered Western Agriculture by EPA. Sandy soils tend to be on sloped land while soils composed of more clay tend to be slope.

Unless instructed on the label, soil incorporation of herbicides is avoided as watering-in would be considered a superfluous use of precious water resources and discing encourages erosion and runoff. As a perennial crop, often with decades old plantings, every effort is made to avoid disturbing the immediate and surrounding root structure of the crop rows.

Contour farming is not typical and because of water limitations, grassed waterways and adjacent to field vegetative strips are not maintained. However, adjacent vegetated ditches are common.

Some producers have terraces, but the vast majority are decades old and are no longer USDA-NRCS compliant.

About 60% of production includes grassed middles (between tree rows). These grassed middles are maintained and mowed, leaving the residue in the field. In scenarios 10 and 11 of the “Application of EPA’s Draft herbicide Strategy Framework Through Scenarios that Represent Crop Production Systems,” this practice appears to be given credit under “contour farming with strips” and on “nearly flat” land, described by NRCS as 0-3%, so we assume it is given credit under “in-field vegetative filter strips.” However, it is unclear why this production practice is not given credit under “residue tillage management” and “cover crop.” Maintaining the perennial crop row and vegetated middles provides year-round field coverage and creates minimal disturbance to the soil, which fits the intended purpose of both practices. EPA should award this credit.

<u>Practice</u>	<u>Frequency</u>	
Sand composed soils	Some	1 (sloped)
<2% (should be ≤ 3%)	Some	1 (clay soils)
Cover crop	Some	*
Contour farming with strips (slope)	Some	3
In-field vegetative filter strips (flat)	Some	3
Residue tillage management	Some	*
Irrigation water management	Frequent	1
Vegetated ditch	Frequent	1
Multiple categories	Some	1

Total of 3 to 7 points

* Despite maintaining a perennial crop and vegetated row middles, these growers are not currently credited for “cover crop” and “residue tillage management.”

State	Entity	Program Name	Link	Category	Notes
AZ	AZ Dept. of Water Resources	AZ Groundwater Management Act	https://new.azwater.gov/conservation/agriculture	State Regulatory	State Groundwater Mgmt. Act regulated 5 Active Management Areas and included compliance and voluntary BMP program; Focus on irrigated ag
CA	CA State Water Resources Control Board	Irrigated Lands Regulatory Program	https://www.waterboards.ca.gov/water_issues/programs/agriculture/	State Regulatory	Regional Water Boards adopted waste discharge requirements for irrigated agricultural lands which contain conditions requiring water quality monitoring and corrective actions
CA	CA Department of Pesticide Regulations	Endangered Species Project	https://www.cdpr.ca.gov/docs/endspec/index.htm	State Regulatory	DPR has maps of endangered species along with mitigation measures specific to the species. Currently no enforceable but if added to EPA BullitinLevel2 the mitigation measures would be.
CA	Certified California Sustainable Winegrowing		https://www.sustainablewinegrowing.org/sustainable_winegrowing_program.php		
CA	Lodi Rules Sustainability Winegrowing		https://www.lodirules.org/		
CA	Sustainable in Practice (SIP) Certified		https://www.sipcertified.org/		
DE	Delaware Dept. of Agriculture	Nutrient Management Certification	https://agriculture.delaware.gov/nutrient-management/certification-education/	State Regulatory	State mandated certification for landowners that apply nutrients to >10 acres
FL	Florida Department of Agriculture and Consumer Services - Office of Agricultural Water Policy		https://www.fdacs.gov/Agriculture-Industry/Water/Agricultural-Best-Management-Practices	State Regulatory	state develops and adopts BMPs by rule for different types of agricultural commodities
KY	Kentucky Energy and Environment Cabinet	KY Agriculture Water Quality Authority	https://eec.ky.gov/Natural-Resources/Conservation/Pages/AeWaterQualityPlan.aspx	State Regulatory	KY Agriculture Water Quality Act (1994) mandated that landowners with >10 acres develop an Agricultural Water Quality Plan to protect surface and groundwater resources; State approved list of BMPs
ME	Maine Dept. of Agriculture, Conservation & Forestry	Agricultural Compliance Program	https://www.maine.gov/dact/php/ag_compliance/index.shtml	State Regulatory	Helps operators maintain compliance with BMPs which are the basis of ME's Agricultural Protection Act which established a "Right-to-Farm" if operators are in compliance
MI	MI Dept. of Agriculture and Rural Development	Michigan Agriculture Environmental Assurance Program (MAEAP)	https://www.michigan.gov/mdard/environment/maeap	State Regulatory	State verification program to prevent or minimize agricultural pollution risks
NE	NE Natural Resource Commission	Erosion and Sediment Control Program	https://nrc.nebraska.gov/erosion-and-sediment-control-program	State Regulatory	state mandated program led through local natural resource districts
OR	Oregon Department of Agriculture	1. Agricultural Water Quality Plans 2. Pesticide Stewardship Partnership (PSP) Program	https://www.oregon.gov/oda/programs/naturalresources/agwa/pages/agwqplans.aspx https://www.oregon.gov/oda/programs/pesticides/water/pages/pesticidestewardship.aspx	State Regulatory	1. ODA developed plans by management area to prevent and control water pollution from agricultural activities and soil erosion on rural lands 2. voluntary program that relies on local partnerships to monitor pesticide levels in waterways and enact solutions to protect water quality while managing pests and maintaining crop yield
WI	State of Wisconsin Department of Agriculture, Trade and Consumer Protection (ATCP)	Bureau of Land and Water Resource Management	https://datcp.wi.gov/Pages/Programs_Services/LWCOverview.aspx	State Regulatory	State regulation ATCP 50 covering various soil and water conservation programs and standards
CO	CO Dept. of Agriculture - Conservation Services Division	Saving Tomorrow's Agricultural Resources (STAR) Program	https://ag.colorado.gov/conservation/agricultural-water-quality	State Certification Program	STAR Program - evaluation system assigns points for management activities on an annual basis and scores are converted to a 1 to 5 STAR Rating, with 5 STARS indicating commitment to a suite of practices proven to improve soil health, water quality and water availability
NY	NY Department of Agriculture and Markets	Agricultural Environmental Management (AEM)	https://agriculture.ny.gov/soil-and-water/agricultural-environmental-management	State Certification Program	Voluntary, incentive based program through Soil and Water Conservation Districts to protect and conserve natural resources and meet farm goals
SC	SC Dept. of Agriculture	South Carolina Farm Agricultural Resource Management and Sustainability Program	https://www.scstatehouse.gov/sess125_2023-2024/bills/3432.htm	State Certification Program	House Bill 2023-2024 General Assembly: To amend Right to Grow Act to include a state designation to recognize farmer's sustainable agricultural practices, long-term resource management, and commitment to best management practices
VT	Vermont Agency of Agriculture, Food & Markets	Vermont Environmental Stewardship Program	https://agriculture.vermont.gov/vesp	State Certification Program	Voluntary, 5 year certification program which requires sediment and erosion control along with other agricultural BMPs, evaluated by conservation planners.
VA	VA Dept. of Agriculture and Consumer Services	Agricultural Stewardship Program	https://www.vdacs.virginia.gov/conservation-and-environmental-agricultural-stewardship.shtml	State Certification Program	Voluntary, pre-enforcement option for landowners to work with local soil and water conservation district to resolve water quality problems reported to VA Dept. of Ag.
WA	A. Washington State Conservation Commission B. WA Dept. of Ecology	1. Voluntary Stewardship Program 2. Voluntary Clean Water Guidance for Agriculture	1. https://www.vsp.wa.gov/ 2. https://ecology.wa.gov/about-us/accountability-transparency/partnerships-committees/voluntary-clean-water-guidance-for-agriculture-adv	State Certification Program	1. VSP adopted on county by county basis for ag producers to participate in critical areas conservation measures sufficient to meet Growth Management Act requirements 2. Comprehensive BMP publication submitted to EPA for approval as part of the 2022 nonpoint plan
ID	ID State Dept. of Agriculture	Environmental/Nutrient Management Program	https://agri.idaho.gov/main/animals/environmental-nutrient-management/	Nutrient Management	Grower coordinates with state certified planner
MD	MD Dept. of Agriculture	1. Office of Resource Conservation 2. Agricultural Nutrient Management Program	1. https://mda.maryland.gov/resource_conservation/Pages/default.aspx 2. https://mda.maryland.gov/resource_conservation/Pages/farmer_information.aspx	Nutrient Management	1. Office of Resource Conservation works with farmers to plan and implement conservation practices 2. Nutrient Management Plan required by law for ag produces grossing >\$2,500/yr.; submission of plan and annual implementation reports required
AL	AL Soil and Water Conservation Districts	Conservation Incentive Program	https://alabamasoilandwater.gov/cip/	Competitive BMP Cost-Share	Competitive cost-share program through local Conservation District
AR	AR Dept. of Agriculture - Natural Resource Division	Nonpoint Source 319 Program	https://www.agriculture.arkansas.gov/natural-resources/divisions/water-management/nonpoint-source-management/	Competitive BMP Cost-Share	Watershed-level non-point source pollution planning
CT	Connecticut Conservation Districts	319 Projects	https://www.conservect.org/programs-and-services/	Competitive BMP Cost-Share	Competitive cost-share program through local Conservation District
GA	GA Soil and Water Conservation Commission	Agricultural Conservation Programs	https://gaswcc.georgia.gov/agricultural-conservation-programs	Competitive BMP Cost-Share	Competitive cost-share program through local Conservation District
IL	Illinois Dept. of Agriculture	Partners for Conservation Program	https://agr.illinois.gov/resources/conservation.html	Competitive BMP Cost-Share	Competitive cost-share program through local Conservation District
IN	Indiana Department of Environmental Management	319 Programs	https://www.in.gov/idem/nps/resources/indiana-nonpoint-source-management-plan/clean-water-act-section-319-agricultural-guidance-for-indiana/	Competitive BMP Cost-Share	Competitive cost-share program through local Conservation District
IA	Iowa Department of Agriculture and Land Stewardship	Resource Enhancement and Protection (REAP) program	https://iowaagriculture.gov/field-services-bureau/water-quality-protection-projects-and-practices	Competitive BMP Cost-Share	Competitive cost-share program through local Conservation District
KS	Kansas Department of Agriculture	Division of Conservation Cost-Share Programs	https://agriculture.ks.gov/divisions-programs/division-of-conservation/financial-assistance	Competitive BMP Cost-Share	Competitive cost-share program through local Conservation District
LA	State of Louisiana Dept. of Agriculture and Forestry	State Soil and Water Conservation Commission	https://www.ldaf.state.la.us/conservation/state-soil-and-water-conservation-commission/#:::text=The%20Louisiana%20State%20Soil%20and,of%20the%20conservation%20district%20program.	Competitive BMP Cost-Share	Competitive cost-share program through local Conservation District
MA	MA State Commission for Conservation of Soil, Water & Related Resources	Massachusetts Division of Agricultural Conservation and Technical Assistance	https://www.mass.gov/guides/division-of-agricultural-conservation-and-technical-assistance-dacta	Competitive BMP Cost-Share	Competitive cost-share program through local Conservation District
MN	MN Board of Water and Soil Resources	Agricultural Lands	https://bwsr.state.mn.us/agricultural-lands	Competitive BMP Cost-Share	Watershed level planning; Cover-crop initiative; Competitive cost-share program through local Conservation District;
MS	MS Dept. of Environmental Quality	Mississippi Soil and Water Conservation Commission 319 Water Quality Program	https://www.mswcc.ms.gov/water-quality	Competitive BMP Cost-Share	Competitive cost-share program through local Conservation District
MO	Missouri Department of Natural Resources	Parks, Soils, and Water Sales Tax - Soil and Water Conservation Cost-Share	https://dnr.mo.gov/land-geology/businesses-landowners-permittees/financial-technical-assistance/soil-water-conservation-cost-share-practices	Competitive BMP Cost-Share	Competitive cost-share program through local Conservation District
MT	MT Dept. of Natural Resources & Conservation	Conservation District Program	https://dnrc.mt.gov/Conservation/Grant-and-Loan-Programs/Conservation-District-Grants	Competitive BMP Cost-Share	Competitive cost-share program through local Conservation District
NV	NV Dept. of Conservation and Natural Resources	Conservation District Program	https://dcnr.nv.gov/divisions-boards/conservation-districts-program/conservation-districts-grant-opportunities	Competitive BMP Cost-Share	Competitive cost-share program through local Conservation District
NH	NH State Conservation Committee	Conservation Grant Program	https://www.agriculture.nh.gov/divisions/scc/grant-program.htm	Competitive BMP Cost-Share	Competitive cost-share program through local Conservation District

NJ	NJ Dept. of Agriculture	Conservation District Program	https://www.nj.gov/agriculture/divisions/anr/nrc/soil.html	Competitive BMP Cost-Share	Competitive cost-share program through local Conservation District
NM	NM Dept. of Agriculture	New Mexico Soil and Water Conservation Commission	https://nmdeptag.nmsu.edu/apr/soil-and-water-districts.html	Competitive BMP Cost-Share	Competitive cost-share program through local Conservation District
NC	NC Department of Agriculture and Consumer Services	Agricultural Cost Share Program (ACSP)	https://www.ncagr.gov/SWC/costshareprograms/ACSP/	Competitive BMP Cost-Share	Competitive cost-share program through local Conservation District
ND	ND Dept. of Environmental Quality	ND Nonpoint Source Pollution Mgmt. Program	https://deq.nd.gov/WQ/3_Watershed_Mgmt/1_NPS_Mgmt/NPS_SWCBinder.aspx	Competitive BMP Cost-Share	BMP guidelines and cost-share program
OH	Ohio Dept. of Agriculture	Ohio Soil and Water Conservation Commission	https://agri.ohio.gov/divisions/soil-and-water-conservation/resources/ohio-soil-and-water-conservation-commission	Competitive BMP Cost-Share	Competitive cost-share program through local Conservation District
OK	OK Conservation Commission	Conservation Programs Division	https://conservation.ok.gov/locally-led-cost-share-program/	Competitive BMP Cost-Share	Competitive cost-share program through local Conservation District
PA	PA Dept. of Agriculture	Agriculture Conservation Assistance Program	https://www.agriculture.pa.gov/Plants_Land_Water/StateConservationCommission/ACAP/Pages/default.aspx	Competitive BMP Cost-Share	Competitive cost-share program through local Conservation District
RI	Rhode Island State Conservation Committee	Conservation District Program	https://www.easternriconservation.org/risc	Competitive BMP Cost-Share	Competitive cost-share program through local Conservation District
SD	South Dakota's Conservation Districts	Conservation Commission Grant	https://www.sdconservation.org/index.asp?SEC=DC0C1F36-FB11-4BCE-BD71-C076091C91C9	Competitive BMP Cost-Share	Competitive cost-share program through local Conservation District
TN	Tennessee Department of Agriculture	Agricultural Resources Conservation Fund	https://www.tn.gov/agriculture/farms/conservation/agricultural-resources-conservation-fund_rd.html	Competitive BMP Cost-Share	Competitive cost-share through local Conservation District
TX	Texas State Soil and Water Conservation Board	Soil and Water Conservation Assistance	https://www.tsswcb.texas.gov/programs/soil-and-water-conservation-assistance	Competitive BMP Cost-Share	Competitive cost-share program through local Conservation District
UT	Utah Dept. of Agriculture and Food	Utah Conservation Districts	https://ag.utah.gov/farmers/conservation-division/conservation-districts/	Competitive BMP Cost-Share	Competitive cost-share program through local Conservation District
WV	WV Conservation Agency	Agricultural Enhancement Program	https://www.wvca.us/agap/	Competitive BMP Cost-Share	Competitive cost-share program through local Conservation District
WY	Wyoming Department of Agriculture	Water Quality Grants	https://agriculture.wy.gov/conservation-districts	Competitive BMP Cost-Share	Competitive cost-share program through local Conservation District