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OREGON DEPARTMENT OF AGRICULTURE

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September 3rd, 2024

Eric W. Bohnenblust, Ph.D, Chief
Minor Use and Emergency Response Branch (MUERB)
Registration Division, Office of Pesticide Programs
1200 Pennsylvania Ave NW
Washington, DC 20460

RE: Section 18 Emergency Exemption for Goltix 700 SC for the Control of Palmer Amaranth in Sugar Beets

The Oregon Department of Agriculture hereby requests an emergency exemption under Section 18 of the Federal Insecticide, Fungicide, and Rodenticide Act to allow the use of metamitron (Goltix 700 SC, not EPA registered) for control of Palmer amaranth in sugar beet in Oregon during 2025. This is our first request for this emergency use.

Sincerely,

Jeannette Krampien
Pesticide Registration Specialist
Oregon Department of Agriculture, Pesticide Program
PH: 503.949.3728
jeannette.krampien@oda.oregon.gov

CC: Chad Schulze, EPA Region 10
Jeremy Buck, US FWS Oregon Office
David Gruen, Oregon DEQ
Joel Felix, Oregon State University Extension Service
Clarke Alder, Amalgamated Sugar Company
Jacob Moore, ADAMA US

REQUEST FOR SPECIFIC EXEMPTION

GOLTIX 700 SC (Metamitron) on SUGAR BEETS

Submitted by the Oregon Department of Agriculture

I. Contact Persons and Qualified Experts

A. State Contact

Jeannette Krampien
Pesticide Registration Specialist
Oregon Department of Agriculture – Pesticide Program
635 Capitol St NE
Salem, OR 97301
Phone: 503.949.3728
Jeannette.krampien@oda.orgegon.gov

B. Qualified Expert(s)

Joel Felix, PhD
Associate Professor, Oregon State University
Malheur Experiment Station
595 Onion Avenue
Ontario, OR 97914
Phone: 541.889.2174
Joel.Felix@oregonstate.edu

Albert Adjesiwor, PhD
Assistant Professor & Extension Specialist
University of Idaho
Kimberly Research and Extension Center
3806 N 3600 E
Kimberly, ID 83341
Phone: 208.423.6616
aadjesiwor@uidaho.edu

C. Grower Representative

Clarke Alder, MS
Weed Scientist, Amalgamated Sugar Company

100 East Locust Avenue
Nyssa, OR 97914
Phone: 208.989.7400
Calder@amalsugar.com

D. Registrant

Zac Carpenter
Product Development Rep
ADAMA US
8601 Six Forks Rd., Ste 300
Raleigh, NC 27615
Phone: 919.501.5082
Zac.carpenter@adama .com

II. Description of Pesticide Requested

The herbicide active ingredient, metamitron, is currently unregistered in the United States. The proposed product is available currently within the European Union, under the tradename Goltix ® 700 SC.

Registrant/Manufacturer: **ADAMA**
Pesticide name: Goltix 700 SC
EPA Reg No.: N/A, EPA company no. 66222
Active Ingredient: Metamitron (1,2,4-Triazin-5(4H)-one, 4-amino-3-methyl-6-phenyl) (58.3%, with 5.84 lbs. of metamitron per gallon)

III. Description of Proposed Use

A. Treatment Sites

Sugar beets are grown in several counties in Oregon. Sugar beets for seed are grown mainly in the Willamette Valley while commercial sugar beets are grown in two counties in Eastern Oregon (Eastern USDA district) and are grown under contract by members of the Amalgamated Sugar Company grower-owned cooperative (“Amalgamated Sugar").

This request will be limited to Malheur County in Eastern Oregon, the county experiencing the greatest pest pressure.

B. Method of Application

Application will be completed by ground application only.

C. Application Timing

Sugar beet planting season spans from March 20 to May 15, weather dependent. The proposed application season for metamitron would therefore be between March 21 and May 17, 2025. The initial application of metamitron would occur within 24-48 hours of planting.

D. Rate of Application

The rate will be 64 fluid ounces per acre (fl oz/a) as a single pre-emergent application. The product will be limited to a total maximum of 64 fluid ounces applied per year.

E. Maximum Number of Applications

A maximum of one application per treatment site will be applied.

F. Total Number of Acres Treated

There are approximately 15,000 acres of sugar beets grown annually in Oregon. Approximately 10,400 of those acres are commercial sugar beets. A survey conducted in 2023 in Idaho and Oregon (Appendix G) identified Palmer amaranth in Malheur County, putting many potential commercial sugar beet acres at risk. Although a single plant was identified in the Willamette Valley in 2023, applications of metamitron would be limited to Malheur County as this is currently the only county with the greatest pressure from Palmer amaranth. **ODA requests this exemption to cover up to 1,629 acres, which represents the potential impacted acres due to projected spread (see Table 4) of Palmer amaranth in 2025 and is approximately 16% of total commercial sugar beet acreage planted annually in Oregon.**

G. Total amount of pesticide to be Used

Using the maximum rate allowed by the emergency use label (64 fluid ounces per acre) times the number of acres potentially treated (1,629) results in an estimated total amount of pesticide to be used of 104,256 fluid ounces or 815 gallons. Goltix® 700 SC contains 5.84 pounds of active ingredient per gallon of formulated product, which would therefore account for a total potential of 4,757 pounds of active ingredient applied.

H. Other Applicable Restrictions

The proposed emergency use label lists "warning" as the hazard word and requires a 12-hour Restricted Entry-Interval (REI). The label also prohibits applications by ground within 100 feet of aquatic areas, prohibits cultivation within 10 feet of an aquatic area to allow for a vegetative filter strip, restrictions applications to alternate years in fields adjacent to aquatic areas, and prohibits the use of sugar beet *leaves* for food or feed.

IV. Alternative Methods of Control

A. Herbicides

The following active ingredients are currently registered in Oregon and labeled for use to control Palmer amaranth in sugar beets: glyphosate (only glyphosate tolerant varieties of sugar beets), glufosinate-ammonium (pre-plant burn-down only), dimethenamid-P, S-metolachlor, and trifluralin. However, other herbicides are used in sugar beets that don't list Palmer amaranth but do list "pigweed", “careless weed” or other related species. The following discussion identifies the use pattern and reasons why all the available herbicides labeled are either ineffective or losing effectiveness on control of Palmer amaranth.

Glyphosate (Group 9, Roundup® and other generics)

All commercial sugar beets planted in the state of Oregon contain the glyphosate resistance trait and can be treated with this product. While glyphosate has provided reliable broad leaf weed control since glyphosate resistant sugar beet varieties were introduced, glyphosate resistance in Palmer amaranth has been confirmed in Oregon. In 2023, resistance was confirmed in 74% of Idaho Palmer amaranth samples tested in Idaho and 100% of those tested in Oregon (Appendix G). When collected from fields showing a lack of control after glyphosate, 100% of the samples were resistant.

Cycloate (Group 8, Ro-Neet®) and ethofumesate (Group 16, Nortron® SC)

These are applied to sugar beets either before planting (usually incorporated) or soon after planting but before sugar beet emerges. They only control weeds that emerge after treatment. They can provide some short-term control of Palmer amaranth, but control will break quickly. An application of a postemergence herbicide is then required to control Palmer amaranth. Typically, glyphosate has been applied for this postemergence control, but as previously noted, Palmer amaranth has now developed resistance to glyphosate.

Dimethenamid-P (Outlook®), S-metolachlor (Dual Magnum®), and acetachlor (Warrant®)

The Group 15 herbicides, such as dimethenamid-P, S-metolachlor, and acetochlor (chloroacetamides) all require application to sugar beet *no earlier than the two true-leaf stage*, since these herbicides will injury sugar beets if applied any earlier. This stage of crop growth can often take four to five weeks after planting to be reached, and in that period early emerged Palmer amaranth can easily reach four inches in height. Group 15 herbicides *have no activity* on emerged weeds, making these products ineffective alternatives. Although these are applied after sugar beets emerge and become established, they will only control flushes of weed emergence that occur after these herbicides are applied. In addition, there are Palmer amaranth populations in other states that are already resistant to dimethenamid-P. Although there is no cross-resistance to other group 15 herbicides, there's a likelihood that some of the Palmer amaranth being introduced into Oregon may be resistant to dimethenamid-P.

Trifluralin (Group 3, Treflan®)

Trifluralin has a similar use pattern to Group 15 herbicides, however it cannot be applied until sugar beets are 2-6 inches tall, to control later flushes of weed emergence that occurs after application. Any exposed beet roots must also be covered with soil prior to application to reduce injury in the way of root girdling. There are Palmer amaranth populations in other states that are already resistant to trifluralin, therefore, there's a likelihood that some of the Palmer amaranth being introduced into Oregon may be resistant to trifluralin.

Clopyralid (Group 4, Stinger®)

Clopyralid has demonstrated minimal control of Amaranthus species and shown no control for Palmer amaranth in Oregon fields.

Triflusulfuron-methyl (Group 2, UPBEET®)

This herbicide has poor activity on Palmer amaranth and other Amaranthus species. Palmer amaranth has also developed resistance to sulfonylureas (Appendix I).

B. IPM Weed Control Alternatives

The grower-owners of the Amalgamated Sugar were an early funding source for the development of an autonomous robotic weed control system built by Aigen. Field trials with this robot helped develop artificial intelligence algorithms to

decipher weeds from small sugar beets in a field, thus allowing autonomous mechanical removal of weeds. This product is currently rolling out to growers across the nation and will allow non-chemical removal of weed pests such as Palmer amaranth. The main drawbacks of this technology include the speed at which the machines can move across fields and the availability of the machines. Because of the rapid growing nature of Palmer amaranth, use of these machines may not be able to keep up with the in-season growth and spread of this pest. In addition, the company is still young in its development and as such, does not have the number of products needed to supply a grower group the size of Amalgamated Sugar.

Cultural Weed Control

Crop rotation: There are still herbicides available in corn that will control Palmer amaranth. However, sugar beets are highly sensitive to these corn herbicides so the required plant back restrictions for sugar beets prevents these being used in corn grown prior to sugar beets. Small grains are often included in rotation with sugar beets, and small grains can outcompete Palmer amaranth due to establishment of these crops in the fall (winter wheat) or early spring (spring barley). Small grains also provide additional chemical control opportunities for controlling broadleaf weeds. However, small grains are harvested as early as July, and Palmer amaranth can be difficult to manage later in the summer and fall. This would allow a heavy weed seed population to be established prior to planting of sugar beets the following spring.

Conservation tillage: Many Amalgamated Sugar growers use some form of conservation tillage, including strip tillage, no-till or some other form of minimum tillage. The resulting residues on the surface can indeed serve as a physical barrier to weed establishment. Some growers also plant cover crops to prevent erosion and to compete with weeds when possible. However, despite these management practices, Palmer amaranth has still become established in these areas. Additionally, those growers who do use more conventional forms of tillage and can bury seed deep into the soil still run the risk of bringing old seed back to the surface. Seeds from Palmer amaranth can last 3-5 years in the soil profile.

Mechanical weed control: With the advent of glyphosate resistant crops, in the past decade many Oregon sugar beet growers have adopted minimum or strip till technology. This has resulted in many beneficial effects on the environment,

including improved soil health, less soil loss from erosion, reduced greenhouse gas emissions, lower fuel consumption and improved water use efficiency. Many farmers have abandoned the use of their deep plowing and cultivation implements. That said, much of the surface irrigated sugar beet ground in the state (approximately 6,000 acres) still see some mechanical weed removal as fields are corrugated 1-2 times per season.

Hand-weeding: Prior to the availability of glyphosate over-the-top, hand labor was also used to control weeds growing in the rows. Cultivation of sugar beet must cease later in the season, since cultivation can damage the large beet growing underground. However, there is currently a national shortage in access to farm labor. At the same time, base wages have increased while farm income has been in decline. What's left are a few local independent farm labor crews who would not be able to keep up with demand should Palmer amaranth reach the scale that it has in Colorado and Nebraska.

Biological Weed Control: There are no available biological weed control products available for Palmer amaranth.

V. Efficacy of Proposed Use Under Section 18

ODA was provided with six studies (attached, see appendices A-G) encompassing four years of research on metamitron field trials completed by Drs. Joel Felix (Oregon State University), Albert Adjesiwor (University of Idaho), Nevin Lawrence (University of Nebraska), Andrew Kniss (University of Wyoming), and Clarke Alder, MS Weed Scientist at Amalgamated Sugar. Field trial sites included locations in Nyssa, OR, Ontario, OR, Kimberly, ID, western Nebraska and southern Wyoming, which all share similar soil compositions and climates. These professionals' work demonstrates that acceptable control of Palmer was achieved using metamitron alone at any treatment level through the 4-true leaf stage (Appendix A). In addition, EPA granted a Section 18 for use of metamitron in Nebraska and Colorado for growers in the Western Sugar Cooperative during the 2024 growing season (Appendix H). Reports from a grower representative of Western Sugar are favorable for safety and effectiveness of metamitron – so much so that an application to EPA has already been made for another Section 18 for 2025 to cover the same area with the addition of areas within the state of Wyoming and Idaho.

The proposed emergency use label follows an existing EU label's maximum use rate of 64 fl oz/acre.

VI. Discussion of Expected Residues in Food

EPA has established a time-limited tolerance at 0.01 ppm for residues of metamitron on sugar beet roots resulting from use of the pesticide pursuant to FIFRA Section 18 emergency exemptions (40 CFR 180.726). This tolerance expires December 31st, 2027. The proposed emergency use label prohibits the use of sugar beet leaves for food or feed.

VII. Discussion of Human Health and Environmental Risk Information

EPA has completed human health and ecological risk assessments in support of Section 18 requests submitted by the Colorado and Nebraska Departments of Agriculture for metamitron use in sugar beets in 2024.

The EPA Health Effects Division determined that there are no dietary, aggregate, or occupational risks of concern associated with the proposed Section 18 use if the personal protective equipment requirements are implemented, and a restricted entry interval (REI) of 12 hours is observed (Smith, C. 2023. Section – 18 Specific Exemptions for the Use of Metamitrion in Sugarbeets to Control Glyphosate-Resistant Palmer Amaranth in Colorado and Nebraska. USEPA). The proposed emergency use label addresses occupational risk with personal protective equipment requirements including shoes, socks, long sleeves and long pants, and waterproof or chemical resistant gloves and an REI of 12 hours. Goltix® 700 SC is Toxicity Category II for acute oral toxicity, Toxicity Category III for acute dermal and acute inhalation toxicity, and Category IV for primary eye and dermal irritation, and it is not a dermal sensitizer. The signal word on the proposed label is “Warning,” and the label states the product "May be fatal if swallowed" and “harmful if absorbed through the skin or inhaled.”

EPA’s Environmental Fate and Effects Division (EFED) determined that there are concerns for non-listed species, including terrestrial and aquatic plants, terrestrial invertebrates, birds (acute), and mammals (chronic) (Smith, C. 2023). EFED also concluded that on-field exposure to pollinators is not expected since sugar beets grown for sugar production do not reach the flowering stage and fields are clear of other non-target pollinator-attractive vegetation, and other effects are not expected for fish, aquatic-phase amphibians, and aquatic invertebrates (Smith, C. 2023). To address risks to non-target organisms through drift and runoff, the proposed emergency use label includes restrictions to prohibit aerial application, use within 100 ft of aquatic sites, cultivation within 10 ft of aquatic areas, and application when wind speeds exceed 15 mph or during temperature inversions. Additionally, the label restrictions applications to alternate years in fields adjacent to aquatic areas.

Threatened or endangered species and critical habitats that are listed by the US Fish and Wildlife Service, and found in Malheur County, Oregon, are listed in Appendix M.

VIII. Coordination with Other Affected Federal, State, and Local Agencies

A copy of this request will be provided to the Oregon Office of the US Fish and Wildlife Service and the Oregon Department of Environmental Quality's Pesticide Stewardship Program.

IX. Notification of Registrant

The support letter from ADAMA is in Appendix N. The Proposed Emergency Exemption Label is in Appendix O.

X. Enforcement Program

The Oregon Department of Agriculture (ODA) has adequate authorities for enforcing provisions of Section 18 Emergency Exemptions. ODA will require the ADAMA to prepare and make available to end users Section 18 Use Directions that comply with EPA requirements for the emergency use, if approved. Applicators will be required to keep adequate records of application use and acreage. Amalgamated Sugar Company, in cooperation with ADAMA, will be required to provide ODA a report summarizing results of the emergency use after the end of the use period.

XI. Repeat Uses

This is Oregon's first request for this product.

XII. Progress Toward Registration

ADAMA has indicated that a section 3 request for a metamitron-containing product has been submitted to EPA as a growth regulator for in pome fruits, and plans for a section 3 request for use on sugar beet to follow. ODA has received no additional insight from ADAMA on further registration plans.

XIII. Information Required for a Specific Exemption

A. Name of Pest

Palmer amaranth (*Amaranthus palmeri*)

B. Discussion of the Events Which Brought the Emergency Condition

The first Palmer amaranth plant was identified and confirmed in Western Idaho in 2022. Additional acreage was discovered and confirmed through laboratory testing in 2023 resulting in a full-scale survey conducted in Idaho and Eastern Oregon in late summer/fall 2023 (Appendix G). This species grows rapidly, can produce over 100,000 seeds per plant and survives well in no-till and minimum till conditions. Seeds can continue to germinate and emerge season-long.

According to a grower representative from Western Sugar Cooperative, within four years, the presence of Palmer amaranth evolved from non-existent to impacting over 66% of sugar beet acreage within the cooperative's growing area in Colorado, Nebraska, and Wyoming. This is not surprising as a single field with viable Palmer amaranth seed can be easily transferred to several others via equipment at harvest, like the spread of other weeds such as kochia (*Bassia scopara*), Russian thistle (*Salsola iberica*), and other Amaranthus species that persist through crop harvest. Currently, Palmer amaranth has been positively identified in 543 acres in Eastern Oregon, with an additional 3,600 acres across Southern Idaho including heavy infestation in Southwestern Idaho near the Oregon/Idaho border. Consulting with Dr. Joel Felix (Oregon State University) and Dr. Albert Adjesiwor (University of Idaho), it stands to reason that Palmer amaranth spread could follow a similar pattern to that of Western Sugar. These five states (Oregon, Idaho, Wyoming, Colorado, and Western Nebraska) share similar silt loam soils with low organic matter, climate, crop rotation such as corn, beans, onions, and small grains, and cultural practices such as irrigated farming and an array of tillage types. This is evident in the consistency of the sugar beet crops across both Western Sugar's and Amalgamated Sugar's growing areas. Furthermore, many growers farm in both Idaho and Oregon, making the spread of weed seeds between the two likely.

Additionally, the loss of other registered post-emergence herbicides in sugar beet following the widespread adoption of glyphosate resistant sugar beet has added to the difficulty in controlling Palmer amaranth. For example, Betamix® (Desmedipham plus phenmedipham) was previously available for control of various broadleaf weeds in sugar beet, applied postemergence to both sugar beets and weeds, including Amaranthus (pigweed) species. The federal registration of Betamix® Herbicide was canceled in 2014. Economic levels of weed control in sugar beets now rely heavily on the use of glyphosate.

Finally, the development of resistance to glyphosate and acetolatacate (ALS) inhibitors, or HRAC group 2 herbicides, in Palmer Amaranth has intensified this crisis. Glyphosate resistance was confirmed in Oregon Palmer amaranth in 2023, with 74% of total samples (100% of Oregon samples) testing as resistant to glyphosate (Appendix I). When samples were collected from fields showing lack of control after glyphosate treatment, resistance the chemistry was confirmed in 100% of those samples.

C. Discussion of Anticipated Risks to Threatened and Endangered Species, Beneficial Organisms, or the Environment that would be remedied by the proposed use of the Pesticide.

With the advent of glyphosate resistant crops, in the past decade many Oregon sugar beet growers have adopted minimum or strip till technology. This has resulted in many beneficial effects on the environment, including improved soil health, less soil loss from erosion, reduced greenhouse gas emissions, lower fuel consumption and improved water use efficiency. The lack of adequately available herbicides to control Palmer amaranth in the future may require growers to either stop producing sugar beets or increase the use of cultivation and tillage to control weed infestations in sugar beets. This would have a negative effect on soil health and soil conservation and would also increase greenhouse gas emissions.

D. Discussion of Anticipated Economic Loss

Data shown in the following tables was provided by Weed Scientist for Amalgamated Sugar, Clarke Alder. As a grower-owned cooperative, Amalgamated Sugar has detailed field-by-field records of sugar beet yields. This is used to determine payment back to growers after processing the harvested beets into sugar. Amalgamated Sugar had their field staff work closely with farmers in Oregon and Idaho to identify occurrences of Palmer amaranth in the two states during 2023 and 2024. With current data, approximately 543 acres are potentially impacted by Palmer amaranth in Oregon (Appendices J - K). Sugar beet acres containing Palmer amaranth in 2024 are being monitored for yield impacts at harvest. As harvest nears, preliminary data is already being collected for the 2024 crop (Appendix L). The number of Oregon impacted acres rest near the beginning (“year 1”) of what could be a 4-year cycle toward a significant crop-loss event if Oregon follows the same trend as Colorado, Nebraska, and Wyoming (see Table 4). If the trend continues, “year 2” would increase to approximately 1,629 acres potentially being impacted.

In communication with ODA, Clarke Alder explained that sugar beet losses due to weed infestation is primarily a yield loss situation, although quality can also be affected to a lesser extent as competition for nutrients occurs.

Table 1. Crop value[1] and gross revenue in fields without Palmer amaranth (past 7 years) in Oregon.			
Year	*Yield (T/A)*	*Price ($/T)*	*Gross Revenue ($/A)*
2024	39.2	$63.92	$2,505.66
2023	40	$70.15	$2,806.00
2022	38.1	$67.00	$2,552.70
2021	39.5	$60.00	$2,370.00
2020	40.5	$53.50	$2,166.75
2019	39	$50.90	$1,985.10
2018	40.5	$46.00	$1,863.00

[1]Price per ton ($/T) is based on NASS data for all but 2023 and 2024 (numbers not available yet). 2023 $/T data was provided by the cooperative based on near year-end actuals to be reported into NASS. The 2024 $/T date was provided by the cooperative based on pre-campaign projections.

Table 2. Four-year projected[2] crop value and gross revenue in fields containing Palmer amaranth (data provided by Amalgamated Sugar).					
Year	*Yield (T/A)[3]*	*Yield with Palmer[2] (T/A)*	*Projected Yield Reduction (%)*	*Price[3] ($/T)*	*Gross Revenue with Palmer ($/A)*
2028	39.5	27.7	30	$58.78	$1,628.21
2027	39.5	27.7	30	$58.78	$1,628.21
2026	39.5	34.3	13	$58.78	$2,016.15
2025	39.5	36.7	7	$58.78	$2,157.23
2024	39.2	37.6	4[4]	$63.92	$2,403.39
2023	40	40	0	$70.15	$2,806.00

[2]Projection of Palmer amaranth impact severity based on trends experienced at Western Sugar Cooperative 2017-2022 and conversations with Grower Representative of Western Sugar Cooperative. Support can be found in EPA document EPA-HQ-OPP-2023-0147-0002 Table 2. Crop value and gross revenue in fields with palmer for the last 7 years.

[3]Projected data: yield and price per ton based on Amalgamated Sugar Company 7-year average yield and price 2018-2024. Data for 2018-2022 directly from NASS, 2023 and 2024 provided by Amalgamated Sugar (footnote 1).

[4]Based on Amalgamated Sugar Ag Staff reports regarding severity of current Palmer infestation in sugar beets during 2024 season.

Table 3. Net revenue analysis projection for 2024-2027 product years (data provided by Amalgamated Sugar).				
Net Revenue Analysis				
Year		*Without Palmer Amaranth*	*With Palmer Amaranth*	*% Change*
2027	**Net Revenue ($/A)**	**$192.17**	**($701.43)**	**-465%**
	Gross Revenue ($/A)	$2,321.81	$1,628.21	**-30%**
	Total Operating Costs ($/A)[5]	$2,129.64	$2,329.64	
	Herbicide/Weed Management Costs ($/A)[6]	122.68	322.68	
2026	**Net Revenue ($/A)**	**$233.93**	**($271.73)**	**-216%**
	Gross Revenue ($/A)	$2,321.81	$2,016.15	-13%
	Total Operating Costs ($/A)	$2,087.88	$2,287.88	
	Herbicide/Weed Management Costs ($/A)	113.59	313.59	
2025	**Net Revenue ($/A)**	**$274.87**	**($89.71)**	**-133%**
	Gross Revenue ($/A)	$2,321.81	$2,157.23	-7%
	Total Operating Costs ($/A)	$2,046.94	$2,246.94	
	Herbicide/Weed Management Costs ($/A)	$105.18	$305.18	
2024	**Net Revenue ($/A)**	**$498.86**	**$196.59**	**-61%**
	Gross Revenue ($/A)	$2,505.66	$2,403.39	-4%
	Total Operating Costs ($/A)	$2,006.80	$2,206.80	
	Herbicide/Weed Management Costs ($/A)	$97.39	$297.39	

[5]Operating Costs from 2022 Sugarbeet Enterprise Budget: Southwestern Idaho, University of Idaho Department of Agricultural Economics and Rural Sociology. Operating costs already include herbicide/weed management costs. Operating costs are expected to increase by 2% each year based on U of I Enterprise Budget from 2013-2022.

[6]Herbicide costs in Oregon are typically around $100 and are costs expected to rise at least 8% per year based on values growers paid for agrichemicals in Oregon from 2019-2024. Prices provided by two large agrichemical companies in Oregon/Idaho. Resistant Palmer amaranth increases the cost of weed management by $200 per acre using a conservative estimate. A worse case scenario would increase cost of production up to $500 per acre if using every available tool to control Palmer including but not limited to hand labor.

Table 4. Projected spread of Palmer amaranth in Oregon[7].		
Year	*Acres Impacted*	*% Total Sugar beet acres*
2027	6,864	66%
2026	4,887	47%
2025	1,629	16%
2024	543	5%
2023	0	0%

[7]Projection model based on documented reports from Western Sugar Cooperative for Wyoming, Colorado, and Nebraska stating that approximately 66% of sugar beet acres were affected within a 4-year period. 543 acres are confirmed in Oregon as of 8/15/24. Yearly increase assumes one sugar beet field with viable Palmer amaranth seeds can spread to two others in rotation via harvest equipment, tillage equipment or other natural means. In year 4, many sugar beet fields will already be infected, slowing the rate of increase.

XIV. Appendix List

A. **Snake River Sugar Research and Seed Alliance Report for Research Funding** Evaluation of Metamitron for Sugarbeet Safety and Weed Control, 2020
B. **Snake River Sugar Research and Seed Alliance Report for Research Funding** Evaluation of PRE/POST Combinations of Metamitron, 2020
C. **Snake River Sugar Research and Seed Alliance Report for Research Funding** Evaluation of Metamitron Under Different Irrigation Systems, 2020
D. **Snake River Sugar Research and Seed Alliance Report for Research Funding** Evaluation of Rotational Crops Response to Torero Herbicide Applied the Previous Fall to Manage Weeds in Sugarbeet, 2022
E. **Snake River Sugar Research and Seed Alliance Report for Research Funding** Evaluation of Crop Rotation Restrictions of Metamitron, 2022
F. **Snake River Sugar Research and Seed Alliance Report for Research Funding** Sugarbeet Response and Weed Control Efficacy of Split-Applications of Torero Herbicide, 2022, 2023
G. **Snake River Sugar Research and Seed Alliance Report for Research Funding** Survey of Herbicide Resistant Weeds in Southern Idaho, 2022-2024
H. **Nebraska Section 18 Acceptance Announcement**
I. **Idaho Weed Survey Updates**
J. **Palmer Amaranth Distribution Map**
K. **Amalgamated Sugar Idaho and Oregon Acres Impacted by Palmer Amaranth (Amaranthus palmeri) During CY 2024**
L. **2024 Case Study** Sugar Beets in Glenns Ferry, ID
M. **Federally Listed Threatened or Endangered Species and Critical Habitats**
N. **ADAMA Letter of Support**
O. **Proposed Emergency Exemption Label**
P. **Amalgamated Sugar Request for Specific Exemption Letter to ODA**