# TOXIC HANGOVER

## How the EPA Is Approving New Products With Dangerous Pesticides It Committed to Phasing Out

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**Executive Summary**

More than 1 billion pounds of pesticides are sprayed on American landscapes every year, which can hurt both human health and the environment. The U.S. Environmental Protection Agency is tasked with ensuring that every pesticide product sold in the United States is safe.

New research is regularly published detailing the harms associated with using pesticides, so it's important that regulatory agencies adapt to incorporate this constantly emerging science and ensure that previously approved pesticides, as they're found to be too harmful, are effectively phased out. However, the EPA generally takes a hands-off approach when it comes to removing pesticides from use, opting to incentivize the development of purportedly lower-risk alternatives and wait for pesticide companies to voluntarily cancel dangerous pesticides. Many extremely harmful pesticides that are banned elsewhere are still widely used in the United States, indicating that the EPA's deferential regulatory approach to pesticides is not working.

For this report we conducted an extensive search of new pesticide products that have been approved by the EPA in recent years. Our analysis found that the agency is actively working against its own efforts to incentivize the replacement of older, more dangerous pesticides by approving new pesticide products that contain these same dangerous ingredients.

**Key finding:** In 2017 and 2018, the EPA approved more than 100 pesticide products containing ingredients widely considered to be the most dangerous still in use, including some that have been banned in multiple countries or targeted for phaseout in the United States. Roughly a third of all approved products had more than one active ingredient.

Pesticide products approved by the EPA in 2017 and 2018 include:

- 15 new products containing neurotoxic carbamates or organophosphates, including chlorpyrifos;
- 17 new products containing the endocrine disruptor atrazine;
- 6 new products containing paraquat, which is so lethal that one spoonful can kill a full-grown adult;
- 4 new products containing the extremely dangerous airborne fumigants methyl bromide or chloropicrin;
- 91 new restricted-use pesticides, which are so dangerous that they can only be applied by a professional;
- 69 new products containing an ingredient the EPA recognizes as a "known" or "likely" carcinogen.

In addition to containing harmful individual ingredients, we found that 1 in every 3 products that have been approved in the past two years contains more than one active ingredient, despite the fact that toxicity is only measured by exposure to a single active ingredient at a time.

This indicates that the EPA is not only *allowing* some of the most harmful pesticides to continue to be used but actively *facilitating* their further use by approving new products with those same ingredients. Shockingly, this is even the case for highly hazardous pesticides for which the EPA has *mandated use reductions or incentivized replacement*, like organophosphates, methyl bromide and atrazine.

The agency currently justifies its numerous approvals of new pesticide active ingredients as a way of replacing and phasing out older, presumably more dangerous pesticide ingredients. Yet in the past two years it has approved many more products with these older ingredients than products with the newer ingredients that were supposed to replace them.

This study highlights a brazenly ineffective pesticide regulatory process by which the EPA prioritizes and incentivizes newer chemicals on the front end while failing to ensure that older, harmful pesticides are promptly being phased out on the back end. The agency's lack of follow-through and permissive product-approval process have worked together to promote use of the world's dirtiest, most dangerous pesticides.

**Recommendation:** The EPA must act to stop the approval of new products that contain the most dangerous active ingredients and take decisive action in phasing out the worst-of-the-worst pesticides.

**Background**

Before a pesticide can be used in the United States, it must be approved, or "registered," by the EPA. The process begins with the EPA receiving an application to register a pesticide along with studies done by the pesticide company on the efficacy and toxicity of the pesticide. The agency then relies largely — and often exclusively — on the industry-submitted studies to assess the human and environmental harms that are posed by the pesticide's active ingredient, which is the ingredient in a pesticide product that controls a pest.[1,2] If it is determined that the active ingredient does not pose any "unreasonable adverse effects" — the legal standard dictated under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) — then the agency will register that active ingredient.[3]

After the single active ingredient is assessed for its effects on human health and the environment, the agency must also register any pesticide product before it can be sold in the United States. Pesticide products contain at least one active ingredient mixed with other chemicals that give the active ingredient(s) specific properties, such as greater toxicity or stability.[4] At this point the EPA must make sure the proposed pesticide label is consistent with the active ingredient review and that all technical requirements and allowable residue levels in food are in place.[5]

While the initial step of registering an active ingredient is a lengthy process that provides opportunity for the public to review and comment, individual pesticide product approvals are often done with no public notification or opportunity for review and largely go unnoticed.

As studies done by independent researchers are continually published that identify harms associated with pesticide use, some pesticides that were once thought to be safe for people and the environment, based on the EPA's initial review of industry studies, no longer meet that standard. But the agency typically takes a laissez-faire approach to removing pesticides from use, opting largely for the voluntary cancellation of pesticides by the companies that sell them.[6] This means that whenever a company simply does not wish to cancel a pesticide, regardless of its known impacts, that pesticide can linger on the market for years or even decades. Consistent with its preference for voluntary action, the EPA also incentivizes the development of "reduced risk" pesticides[i] by expediting the approval of what it considers lower-risk alternatives that have the potential to replace the most harmful pesticides.[7]

While voluntary cancellations and financial incentives have — in limited instances — been effective in removing some older, more harmful pesticides, they are insufficient overall. For example, neurotoxic organophosphate (OP) pesticide use has decreased dramatically in the United States over the past 25 years, and this is attributed largely to voluntary cancellations that occurred after the Food Quality Protection Act (FQPA) was signed into law.[8] But the use of some OPs, such as bensulide, acephate, dicrotophos and malathion, has largely stayed constant or increased over that time period.[9] "Restricted Use Pesticides" (RUPs) like atrazine, paraquat, bifenthrin and abamectin are so dangerous they can only be handled by certified applicators, yet their use has also stayed constant or increased over the past two decades.[9] This indicates that incentives, voluntary cancellations and restricted-use designations alone are inadequate mechanisms for removing older, more dangerous pesticides.

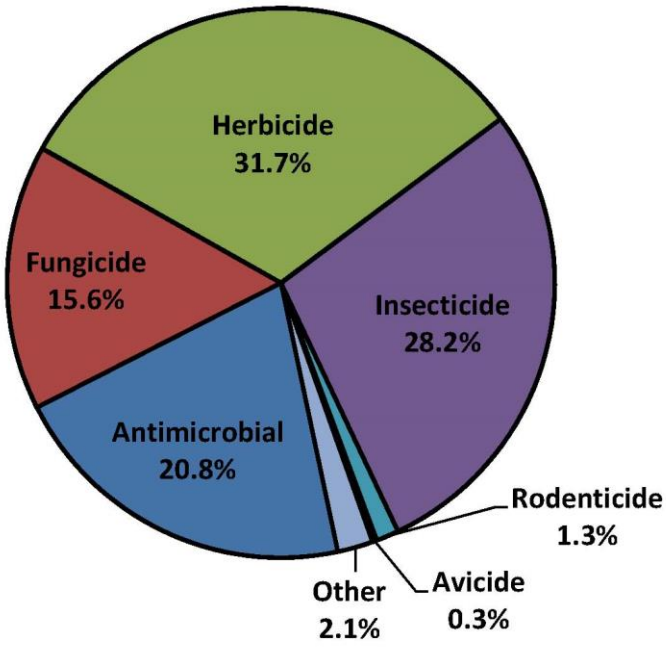
Here we analyze the EPA's actions in granting pesticide-product approvals in 2017 and 2018 and find that the agency is actually working against itself and its mission and keeping the most harmful pesticide active ingredients on store shelves.

[i] Reduced Risk pesticides can still have considerable harms associated with them and are not necessarily safer in all aspects than the pesticides they are meant to replace. For example, some neonicotinoid pesticides are considered "reduced risk" despite a scientific consensus that they are causing widespread environmental harm.

**Results**

A total of 1,190 end-use pesticide products were approved in the United States in 2017 and 2018, an average of nearly 600 per year (Appendix A and Methods).[ii] These range from products designed to kill small microbes like bacteria to those that kill birds or small mammals. Herbicides and insecticides were the most common products approved, followed by antimicrobials and fungicides (Figure 1).

**Figure 1. Pesticide Products Approved in the U.S. in 2017-2018 by Type**




During this same time period, we found 74 examples where applications for a pesticide-product approval were either not granted or rejected by the EPA (Appendix B and Methods). Three of the pesticide products whose approval was officially not granted in 2017 were subsequently approved in 2018, leaving just 71 pesticide products that the EPA rejected or did not approve during 2017 and 2018. With 1,190 pesticide products approved and 71 products denied approval, the pesticide product approval rate by the agency for 2017 and 2018 was roughly 94 percent.[iii] In every instance where information was provided on the basis of the rejection of a pesticide-product application, the rejection came as a result of the agency determining that the minimum study or packaging requirements had not been met (Appendix B). In other words pesticide-product denials appeared to be largely procedural in nature, having little to do with the toxicity of the ingredients they contained.

A review of individual ingredients in the products that were approved indicated that many contain very harmful pesticides, some of which have been banned by other countries and even targeted for phaseout in the United States (Figure 2). The following is a list of pesticides or groups of pesticides whose use is being perpetuated in the United States by very recent EPA approvals.

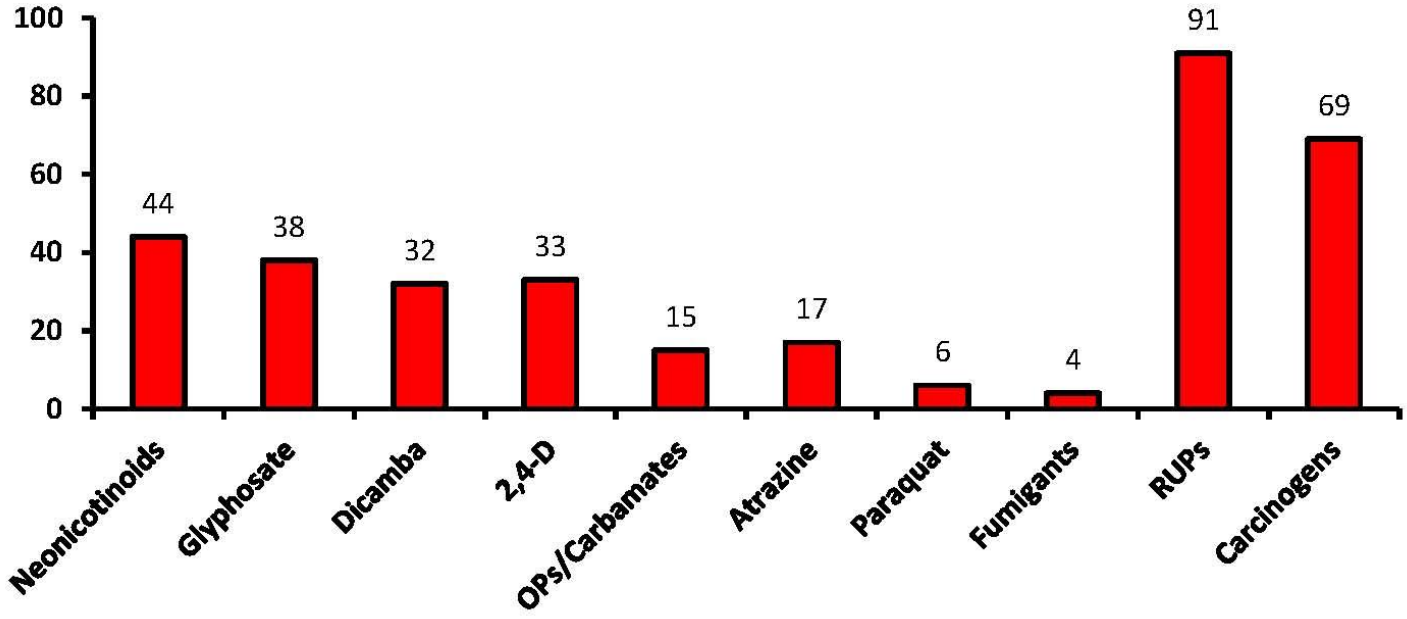
Organophosphates and Carbamates

*What are they?*

Pesticides in the organophosphate (OP) and carbamate classes are known neurotoxins that disrupt normal brain and muscle function in humans and other animals.[10] One OP, chlorpyrifos, is jeopardizing the continued existence of more than 1,400 endangered plants and animals, including Southern Resident killer whales and the salmon they need to survive.[11,12] These are widely considered to be two of the most dangerous pesticide classes still used in the United States.

[ii] Data provided to the Center for Biological Diversity in response to FOIA request # EPA-HQ-2019-005048.
[iii] This approval rate takes into account official product approvals and official denials of approval during 2017 and 2018 (see Methods). The rate does not take into account any instances where a registrant voluntarily revoked its application before an official decision by the EPA was made, as those data are not available. It also does not account for any application that was officially not granted in 2017 or 2018 but subsequently approved in 2019 or beyond, that being outside the time frame of the study.

## Figure 2. Number of Pesticide Products Approved in 2017 and 2018 for Select Active Ingredients and Classes




*What happened?*

In 2017 and 2018 the EPA approved 15 products containing OP and carbamate pesticides. These include the pesticide active ingredients chlorpyrifos, malathion, acephate and oxamyl. The allowable uses of these products vary widely from application in food-processing plants and warehouses to widespread mosquito spraying and spraying on agricultural crops such as potatoes, lettuce and peanuts.

*Why does this matter?*

The use of OPs and carbamates as a whole has declined since the passage of FQPA, yet some pesticides in these classes have stayed constant or even increased in the past 20 years.[6] The approval of new products containing these highly toxic ingredients appears to be facilitating the increased use of some of them.

The EPA's "Reduced Risk" Program, by which it incentivizes companies to seek approval for lower-risk pesticides, has specifically prioritized OP alternatives since 1998.[13] EPA even expedites review of pesticides that are OP alternatives but *offer no "reduced risk."*[13] Thus the agency is incentivizing the replacement of these active ingredients while actively working against that incentive by approving newer, updated products with those same ingredients.

<u>Atrazine</u>

*What is it?*

Atrazine is the second-most widely used pesticide in the United States, with around 70 million pounds used every year.[9] This herbicide is one of the most commonly detected pesticides in drinking water, surface waters and groundwater across the country.[14,15] An endocrine disruptor that can cause substantial harm to amphibians, reptiles, mammals and birds, atrazine also has unacceptable impacts on human health, including elevated risk of kidney disease, birth defects and significant reproductive harm.[16,17,18,19]

*What happened?*

In 2017 and 2018 the EPA approved 17 new products containing atrazine. One of those products is designed for use on roadsides and lawns, while the other 16 are for widespread use on corn and sorghum fields.

*Why does this matter?*

Atrazine's ability to contaminate essential groundwater supplies was a major factor in the European Union (EU) decision to ban the pesticide in 2004.[20]

In a convoluted attempt to reduce the amount of atrazine that is used in the United States, the EPA, as part of its conditional registration of the atrazine-containing product Acuron™ in 2015, required the primary manufacturer of atrazine (Syngenta) to demonstrate that use of atrazine from its products was falling by the year 2020.[21] This was a rare public admission that atrazine use is troublesome and must be reduced. However, all 17 newly approved products were from companies other than Syngenta, putting them outside the scope of the EPA's atrazine-use reduction mandates. This is another example of the pesticide office at the EPA taking one step forward and two steps backward on reducing the use of the most dangerous pesticides.

Paraquat

*What is it?*

Paraquat is the most acutely lethal pesticide in use today: Just a teaspoon is enough to kill a grown adult.[22] Between 1990 and 2014 there were 27 deaths, 22 high-severity incidents and 181 moderate-severity incidents involving paraquat in the United States.[6] There has also been at least one death in the United States each year from paraquat ingestion since 2012.[6] Studies also show a link between paraquat exposure and Parkinson's disease.[23,24]

*What happened?*

Six new products containing paraquat were approved in 2017 and 2018, with use of the pesticide allowed on more than 100 different agricultural crops and ornamental plants grown all across the country.

*Why does this matter?*

Paraquat is one of only two pesticides that are approved for use in the United States but banned or being phased out in China, Brazil and all 28 countries in the EU.[6] Despite its highly toxic nature and banned status in most other large agricultural nations, paraquat use has been steadily increasing in the United States in recent years. The pesticide's use has increased nearly 200 percent since 2009,[25] likely facilitated by newer product approvals such as these.

Fumigants (Methyl Bromide and Chloropicrin)

*What are they?*

The fumigants methyl bromide and chloropicrin are gases that are injected into soil or released into surrounding air to kill insects and smaller organisms. Due to the ability of fumigants to easily drift in the air, humans and other animals are at serious risk from breathing in these pesticides. Both have myriad health concerns for people and animals.[26,27] In addition, methyl bromide is a potent ozone-depleting molecule targeted for phaseout by the Montreal Protocol.[28]

*What happened?*

In 2017 and 2018 the EPA approved two new products containing methyl bromide and two new products containing chloropicrin. The two methyl bromide products are for the few exempted uses the EPA still allows: fumigating agricultural commodities in sealed chambers and fumigating soil for certain nursery plants and agricultural crops. The two

chloropicrin products were for controlling termites in wood structures and use as a soil fumigant for many agricultural crops, such as cucumbers, onions and strawberries.

*Why does this matter?*

Chloropicrin has been steadily increasing in the United States over the past 25 years despite being so dangerous that it is banned in the EU and in the process of being phased out in China.[6]

Methyl bromide use has decreased dramatically since being classified as a Class I ozone-depleting substance by the Montreal Protocol. While the United States officially "phased out" methyl bromide in 2005 as a condition of being a party to the Montreal Treaty, certain uses have remained exempt from that phaseout and remain in use to this day.[28] These exemptions remain in place more than a decade later despite the fact that the EPA expedites review of pesticides that are methyl bromide alternatives.[29] So, much like with OPs, the EPA is incentivizing replacement of this active ingredient while approving newer, updated products with this same dangerous pesticide.

Restricted Use Pesticides

*What are they?*

"Restricted Use Pesticide" (RUP) is a designation given to pesticides with the most potential for acute harms to humans and the environment. In addition to these immediate harms, the EPA further acknowledges that they "may cause significant subchronic toxicity, chronic toxicity, or delayed toxic effects" to humans or "discernible adverse effects on non-target organisms, such as significant mortality or effects on the physiology, growth, population levels or reproduction rates" of animals or plants.[30]

*What happened?*

The EPA approved 91 RUPs in 2017 and 2018, about 45 per year. These products contain some of the most harmful pesticide active ingredients still used today, including atrazine, paraquat, methyl bromide, chloropicrin, chlorpyrifos, abamectin, bifenthrin, oxamyl, tefluthrin, lambda-cyhalothrin and diphacinone. Most of the approved products are for widespread agricultural use.

*Why does this matter?*

While RUPs can only be applied by certified applicators, their inherent toxicity makes them extremely dangerous to nearby people and animals. In fact, by its very designation of these products, even the EPA is acknowledging they may be causing harm. Yet the EPA has approved nearly 100 of them over a span of two years, actively promoting the continued use of chemicals *its own scientists* recognize as extremely dangerous.

Known or Likely Carcinogens

*What are they?*

The EPA currently has five categories for pesticides based on their potential to cause cancer in humans. These include the designations "carcinogenic to humans" and "likely to be carcinogenic to humans," which indicate that the agency has found at least "adequate evidence" that the pesticide can cause cancer in humans.[31]

*What happened?*

In 2017 and 2018 the EPA approved 69 pesticide products containing an ingredient[iv] that the agency recognizes as a known or likely carcinogen.[32,33] This includes a wide variety of different pesticides, including avicides, insecticides and

[iv] Pesticide active ingredients include: anthraquinone, chlorothalonil, diuron, hexythiazox, imazalil, iprodione, kresoxim-methyl, lactofen (high doses only), permethrin, pymetrozine, thiabendazole (high doses only), thiophanate-methyl, mancozeb, propargite.

herbicides; the majority, though, are fungicides. These new products are approved for a broad set of uses in agriculture, coating paper products, ornamental plants, golf courses, paint additives and elsewhere.

*Why does this matter?*

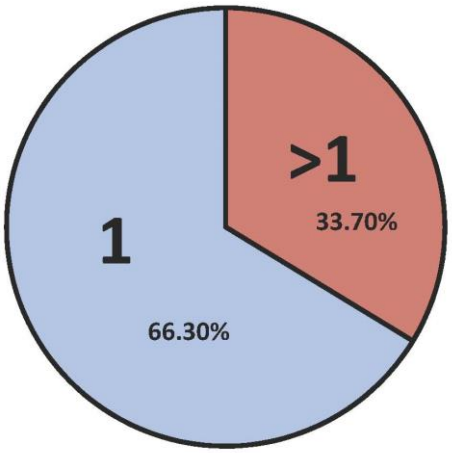
Many other countries have legal mandates preventing pesticides from being approved when the country's regulating authority links them to cancer.[6] The United States has no such mandate and currently allows the use of dozens of pesticides linked to a debilitating disease that is the country's second-leading cause of death.[34]

Multi-ingredient Pesticides

*What are they?*

All pesticide products are mixtures of an active ingredient and "other" ingredients that are added to the formulated mixture. Some pesticides, however, also contain more than one active ingredient in order to facilitate the application of multiple pesticides to an area.

**Figure 3. Recently Approved Pesticide Products by # of Active Ingredients**




*What happened?*

Of the 1,190 pesticide products the EPA approved in 2017 to 2018, 401 contain more than one active ingredient, accounting for 33.7% of all pesticide products (Figure 3). These products range from two active ingredients to six in a single product.

*Why does this matter?*

When the EPA analyzes the harms associated with pesticides, it only takes into account exposure to a single active ingredient at a time. This practice fails to fully capture the risk and potential harms that can be caused by 1 out of every 3 products it's approving. This is in addition to the EPA's refusal to consider the impacts of interactions between active ingredients and other ingredients in formulated products that can result in increased toxicity.[35] This refusal to analyze harm from ingredient mixtures, the same mixtures that are sold on store shelves, calls into question the effectiveness of a risk-assessment process that ignores these highly relevant exposures.

**Conclusion**

In 2017 and 2018 the EPA approved 94 percent of all applications it received for new pesticide products — nearly 1,200 products in total — some of which contain the most harmful pesticides still allowed for use in the United States.[v] This is particularly worrisome given the lack of transparency of product approvals and the toxicities associated with many of the pesticide ingredients that are being approved.

Despite the EPA's claim that its policy of aggressively encouraging new pesticides and granting new product approvals facilitates movement away from the use of dangerous old pesticides, the fact that nearly all of the dangerous pesticide ingredients highlighted in this report have stayed constant or increased in use over the past 25 years in the United States indicates that this is simply not the case.[9]

To allow the use of older pesticide products containing these extremely harmful ingredients while they are slowly being phased out would be one thing, but to keep approving new products with these ingredients is another thing entirely. By allowing newer formulations and mixtures with these hazardous pesticides to be approved, the EPA is actively facilitating

[v] It is unclear how the pesticide approval rate and number of highly hazardous pesticides relates to past years, since we are unaware of any similar reviews that have been done on past pesticide product approvals in the U.S.

an increase in their desirability. This can give extended life to pesticides that should be banned or, at the very least, steadily decreased and phased out.

Many newer active ingredients have gained approval with the expressed justification that they are less toxic and may replace older pesticide ingredients (See registration decisions for sulfoxaflor,[36] cyantraniliprole,[37] flupyradifurone[38] and halauxifen-methyl[39]). There are very little data to support that this is actually occurring. With the widely adopted practice of combining pesticides with different modes of action, it's likely that newer pesticides are largely being used in addition to older pesticides instead of replacing them. This is consistent with only six products being approved in the past two years containing the above four new active ingredients and the hundreds of products containing the OP, carbamate, pyrethroid, neonicotinoid and ALS inhibitor pesticides they were supposed to help replace (Appendix A). Approving new pesticides alone is manifestly not an effective way of replacing older pesticides.

In addition, by approving new products that contain extremely harmful pesticides, the EPA is actively working against incentives it has spent years, and a small fortune, implementing for "reduced risk" pesticides. A true transition to safer pest-control methods requires more than just prioritizing safer chemicals and waiting for industry to voluntarily cancel pesticides; it also requires concerted phaseouts, with hard deadlines, of the worst pesticides, as well as moratoriums on new approvals of harmful products.

The EPA has clearly failed in this respect and, instead, is actively promoting the use of the worst pesticides and ultimately impeding the transition to safer and more sustainable agriculture in the United States.

**Additional Materials**

Methods

Appendix A – Pesticide Products Approved by the EPA in 2017 and 2018

Appendix B – Pesticide Product Denials in 2017 and 2018

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