

# ECONOMIC RISKS OF PESTICIDE USE & POLLINATOR DECLINES

## Food costs are predicted to increase as pollinator populations decline

Pollinators are a cornerstone of a dependable food supply. They contribute approximately \$34 billion to the U.S. economy and up to \$577 billion to the global economy annually.<sup>1,2</sup> Honey bees alone contribute an estimated \$20 billion to the U.S. economy<sup>3,4</sup> and \$217 billion to the global economy.<sup>5</sup> Pollinator decline presents a material risk for the supply chains of food retailers.<sup>6</sup> Food costs are predicted to rise as managed and wild pollinator populations decline.<sup>7</sup> Research indicates that pollinator loss has already resulted in decreased production of key crops like apples, cherries and tomatoes in the United States.<sup>8</sup>

## Pesticides are costly inputs

U.S. farmers spend approximately \$15 billion on pesticides annually.<sup>9,10</sup> Every year, North American farmers spend approximately \$782 million on neonicotinoids alone — the pesticide class most strongly linked to pollinator declines.<sup>11</sup> These expenditures could be invested in alternative pest management strategies instead.<sup>12</sup>

## Farmers are paying more than ever to hire managed honey bees

Managed honey bees have a value of \$15 to \$20 billion in North American agriculture, and demand for pollinator-dependent crops in the U.S is at an all-time high.<sup>13</sup> However, losses of honey bee colonies since 2004 has left North America with fewer managed pollinators than at any time in the last 50 years, with commercial beekeepers consistently reporting annual losses of 29-45%, far exceeding the historical rate of 10-15%.<sup>14</sup> In 2021, U.S. beekeepers reported 45% losses in the previous year.<sup>15</sup> High colony loss rates require beekeepers to rapidly rebuild their colonies at substantial expense, which increases the costs of commercial pollination for farmers. For instance, the cost of renting honey bee hives for almond pollination tripled from 2003 to 2009 from approximately \$50 per hive to \$150 - \$175.<sup>16</sup>

## Farmers are increasingly paying for an ecosystem service that wild pollinators could provide for free

The market for managed bees is expanding due to the increasing scarcity of wild pollinators since the 1980's.<sup>17</sup> In other words, growers are increasingly paying costly commercial pollinators for an ecosystem service that wild pollinators could perform for free.

Worldwide, there are an estimated 20,000 species of bees with approximately 3,600 species native to North America.<sup>18</sup> Native species play a vital role in pollinating agricultural crops in the United States and are often more efficient pollinators than non-native species, such as honey bees.<sup>19</sup> According to an analysis across five continents, wild bees contributed approximately \$3,251 per hectare of crops including watermelon, tomato, cranberry, and blueberry.<sup>20</sup> Researchers estimate that the countries most impacted by wild pollinator declines are in the global South, particularly Africa.<sup>21</sup>

One analysis estimated that declining managed and wild pollinator populations could result in a \$10.5 billion loss to farmers and a \$334 billion loss to the whole economy including price and household effects.<sup>22</sup>

## Pesticides' harm to beneficial insects results in reduced crop yields

Pesticides often harm or kill neutral or useful organisms in an ecosystem, including pollinators. Thus, pesticides can reduce yields rather than bolster them by harming beneficial insects. As one example, certain pesticides targeted at early-season pests, such as maggots, have been found to increase other pest populations that feed on crops, subsequently reducing yields.<sup>23</sup> Yield reduction associated with pesticide use results in an estimated \$1.4 billion loss in the U.S alone with greater losses at a global level.<sup>24</sup>

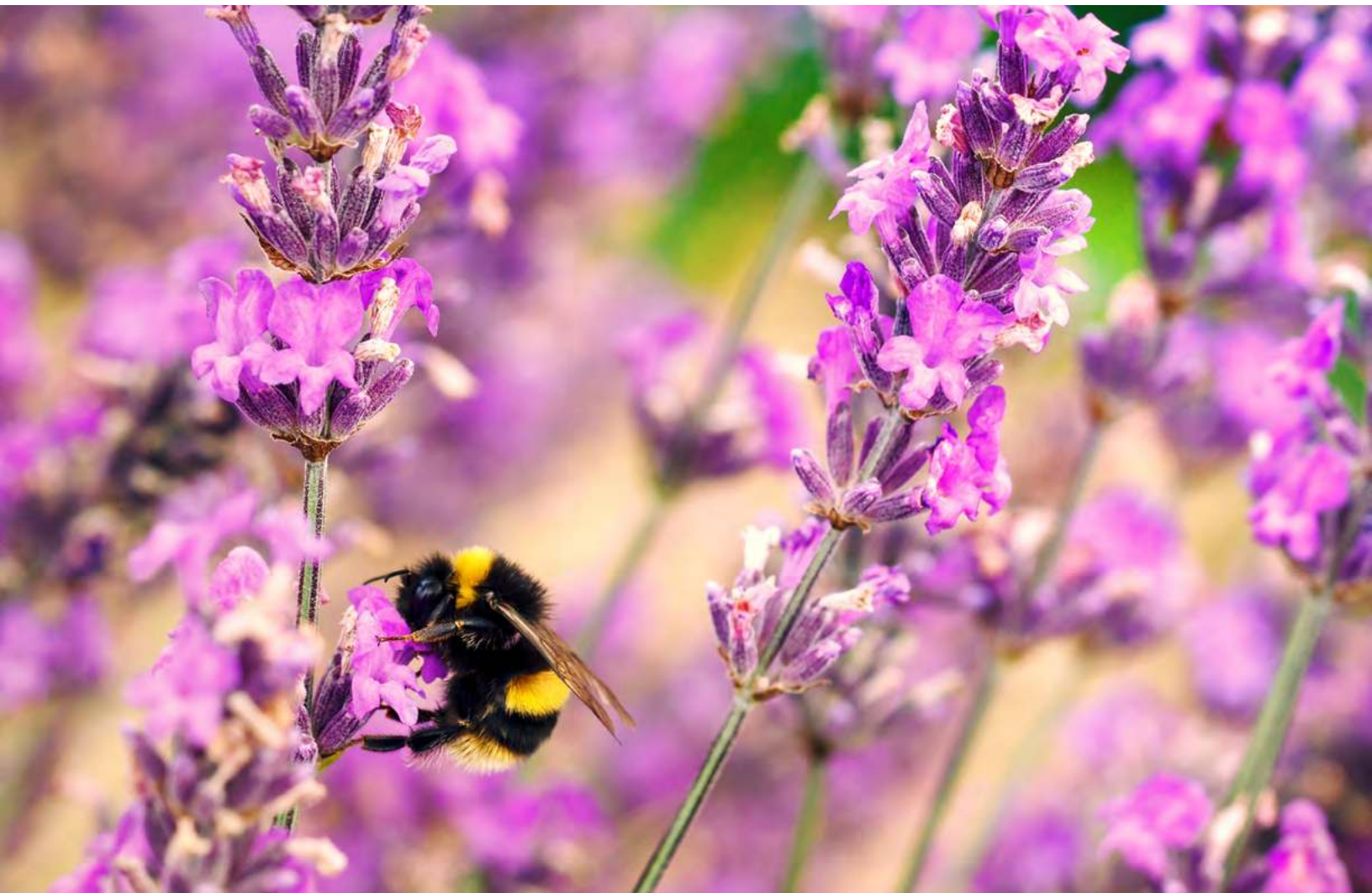
## **Pesticide use results in weed and insect resistance which increases farmers' costs**

Since the widespread introduction of synthetic pesticides to agriculture in the 1950s, approximately 368 weed varieties and over 600 insect species have developed resistance to commonly used pesticides.<sup>25,26</sup> For example, due to widespread use of glyphosate in conjunction with genetically engineered Roundup Ready™ crops, “superweeds” now plague more than 60 million acres of U.S. farmland.<sup>27</sup>

Weed and insect resistance perpetuates a cycle of pesticide use — ninety percent of Iowa farmers report feeling that “pest management is a never-ending technology treadmill.”<sup>28</sup> As a result, farmers experience an increase in production costs due to more intensive and frequent application of pesticides.<sup>29,30</sup> For example, pesticide costs for Illinois corn farmers rose 67% from 2012 to 2017 largely due to the prevalence of herbicide-resistant weeds, and herbicide costs have more than doubled for most farmers over the past 10 to 15 years.<sup>31, 32</sup>

## **Investors recognize the economic importance of pesticide reduction and pollinator protection**

In a comprehensive analysis of the issue, global asset manager, Schroders, urges investors to engage with companies to develop plans to halt and reverse pollinator declines given the scope of pollinator-dependent products.<sup>33</sup> Some shareholders have prioritized pesticide reduction as a sustainability goal. Shareholder advocacy has resulted in company programs such as McDonald's efforts to reduce pesticide use in its potato supply chain.<sup>34</sup> And in 2018, nearly one third of shareholders called on General Mills to eliminate pesticides like pollinator-toxic neonicotinoids from its supply chain.<sup>35</sup> Such efforts speak to the urgency of pollinator declines and to the growing recognition of concomitant economic risks.



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