OBAMA-BIDEN TRANSITION PROJECT

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Agricultural Pesticide Use in U.S. Agriculture

Why USDA-NASS Agricultural Chemical Reporting is Important

For data on increased herbicide use in U.S. agriculture, skip to

What are chemical pesticides?

Chemical pesticides are synthetic compounds used to kill any pest, such as weeds, insects and plant pathogens (e.g. fungi and nematodes).

Why is it important to track pesticide use?

Various pesticides are known or suspected to have unintended adverse effects on human health and the environment—such as increased risks for cancer, neurological disorders, and endocrine and immune system dysfunction; impaired surface and ground water; and harm to fish and wildlife. In addition, chemical pesticides become less effective as pests develop resistance to them, just as pathogenic bacteria develop resistance to antibiotics. As a result, farmers increase pesticide use and eventually switch to other pesticides that also may become ineffective – a phenomenon dubbed "the pesticide treadmill." Pesticides also often kill predators that would otherwise help control pests. Accurate data on pesticide use is crucial to making informed decisions on pest management policy – both to minimize harm to human health and the environment, and to slow or prevent development of resistance in pests.

Are there alternatives to chemical pesticides?

Biological (i.e. non-chemical) methods to control pest populations include crop rotation, introduction of pest predators, intercropping, cover crops, disruption of pest mating cycles, use of pest-resistant crop varieties, altering planting dates, and tillage (weeds). Organic production systems do not permit use of synthetic pesticides. Integrated pest management (IPM) prioritizes biological pest control methods and minimizes use of chemical pesticides.

Does the government have policies on pesticide use?

In 1977, the USDA adopted a policy to encourage use of integrated pest management in order to reduce chemical pesticide use and its associated risks. In 1993, USDA and EPA committed to a goal of 75% of U.S. cropland under integrated pest management by the year 2000.[1]

What is the state of integrated pest management?

In 2001, the General Accounting Office (GAO) found that USDA and EPA had not made good on their commitments to foster IPM. While USDA estimated that 71% of U.S. cropland was managed using IPM practices in 2000, overall agricultural pesticide use increased by 40 million lbs. from 1992 to 2000, even as total cropland decreased. GAO found that USDA's overly expansive definition of IPM included

[1] "Agricultural Pesticides: Management Improvements Needed to Further Promote Integrated Pest Management," Government Accounting Office, GAO-01-815, August 2001. http://www.gao.gov/new.items/d01815.pdf.

measures – such as monitoring for pests and cleaning farm equipment – that, while useful, do not by themselves yield meaningful outcomes in terms of reduced pesticide use. For instance, while USDA estimated that 76% of corn was under integrated pest management in 2000, biological pest control was practiced on at most 18% of corn acres.[2] Accurate pesticide usage information is essential to track progress in meeting the government's IPM goals.

Uses and types of pesticides

Agriculture accounts for three-quarters of all chemical pesticide usage in the U.S., over five times the amount used by industry and government, and nearly seven times that applied to lawns and gardens (Figure 1). In 2001, the last year for which the Environmental Protection Agency has published data, 675 million lbs. of chemical pesticides were used in U.S. agriculture.

Herbicides used to kill weeds comprise nearly two-thirds of agricultural chemical pesticide use (433 million lbs. in 2001), nearly six-fold more than the insecticides that many associate with the term "pesticide" (Figure 2).

Figure 1: Chemical Pesticide Use in the U.S. by Sector: 2001

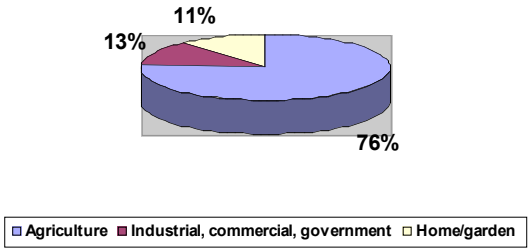
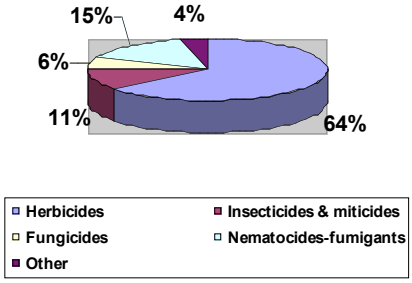


Figure 2: Agricultural Pesticide Use in the U.S. by Type: 2001



Source: "Pesticides Industry Sales and Usage: 2000 and 2001 Market Estimates," U.S. Environmental Protection Agency, May 2004, Table 3.4. http://www.epa.gov/oppbead1/pestsales/01pestsales/market_estimates2001.pdf.

Are there any trends in pesticide use?

The most significant current trend in pesticide use involves herbicides. After long-term declines, USDA-NASS data show that herbicide use on the major field crops – soybeans, cotton and corn – began to rise in 2002 and 2003 (Figure 3).

Why is herbicide use on the rise?

Widespread introduction of Monsanto's genetically modified (GM) Roundup Ready soybeans, cotton and corn has been associated with a 15-fold increase in the use of glyphosate weed killer (brand name Roundup) from 1994 to 2005 on these three crops in the U.S. (Table 1). This vastly increased use of glyphosate has spawned an epidemic of weeds resistant to the chemical, most of which have developed since the year 2000. Resistant weeds drive increased rates of glyphosate application and/or rising use of other herbicides in combination with glyphosate.[3] As a result, use of atrazine, 2,4-D and other leading weed-killing chemicals has increased since 2002 (Table 2).

Why are USDA-NASS data important?

USDA-NASS offers the only reliable, publicly-accessible, fine-grained data on agricultural chemical use in American agriculture. Without USDA-NASS data, it will be difficult if not impossible to track important trends in pesticide use such as the increased use of herbicides noted above.

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[2] See GAO report referenced in footnote 1.

[3] "Who Benefits from GM Crops? The Rise in Pesticide Use," Friends of the Earth International & Center for Food Safety, 2008, see especially pp. 8-12. See: http://www.centerforfoodsafety.org/WhoBenefitsPR2_13_08.cfm.

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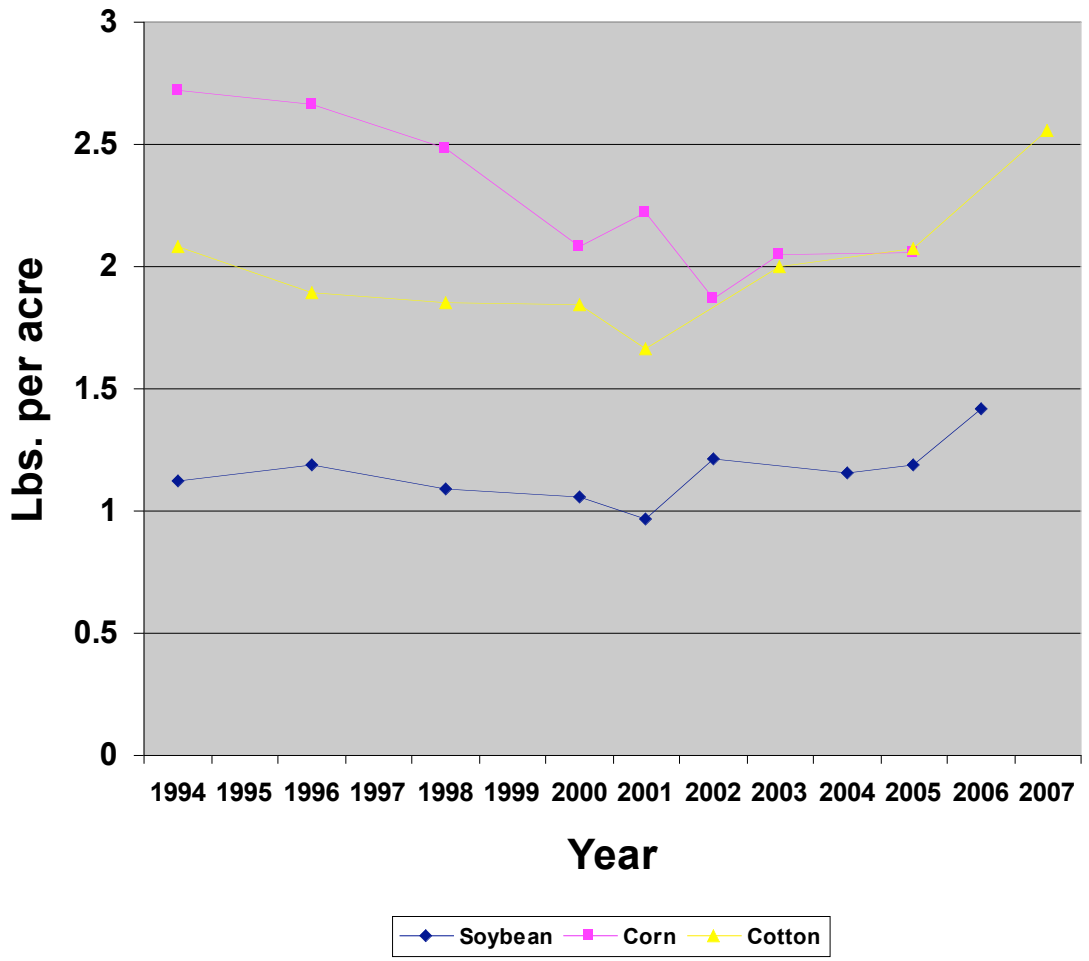
Figure 3: Intensity of Herbicide Use on Major Field Crops in the U.S.: 1994 - 2007



Notes: Intensity of herbicide use began rising in 2002 for soybeans and cotton, and in 2003 for corn, as herbicide-tolerant versions of these crops became prevalent. Resistant weeds have been especially problematic in soybeans and cotton, as reflected by the large spike in herbicide use on cotton from 2005 to 2007 (USDA did not provide pesticide usage data for soybeans or corn in 2007).

Sources: "Agricultural Chemical Usage: Field Crops Summary," USDA National Agricultural Statistics Service, for the respective years. Accessible from: http://usda.mannlib.cornell.edu/MannUsda/viewDocumentInfo.do?documentID=1560. The figures represent total herbicide use on the respective crop in the "Program States" included in USDA's survey, divided by the number of acres planted to that crop in the Program States. The Program States surveyed by USDA represent a high percentage of nationwide acreage planted to the crop (usually more than 80%, often more than 90%). The only assumption made here is that the amount of herbicides applied per acre covered by the survey is equal to that applied on acres not included in the survey. This is accepted practice for calculation of pesticide intensity. For instance, see Table 3.3.3 in Section 3.3: "Biotechnology and Agriculture," in: "Agricultural Resources and Environmental Indicators, 2006 Edition," USDA Economic Research Service, Economic Information Bulletin 16, July 2006, accessible from: http://www.ers.usda.gov/Publications/AREI/EIB16/. In this 2006 report, USDA for some unexplained reason plotted pesticide intensity on major field crops only up through 2001 or 2002, despite the availability of data for later years.