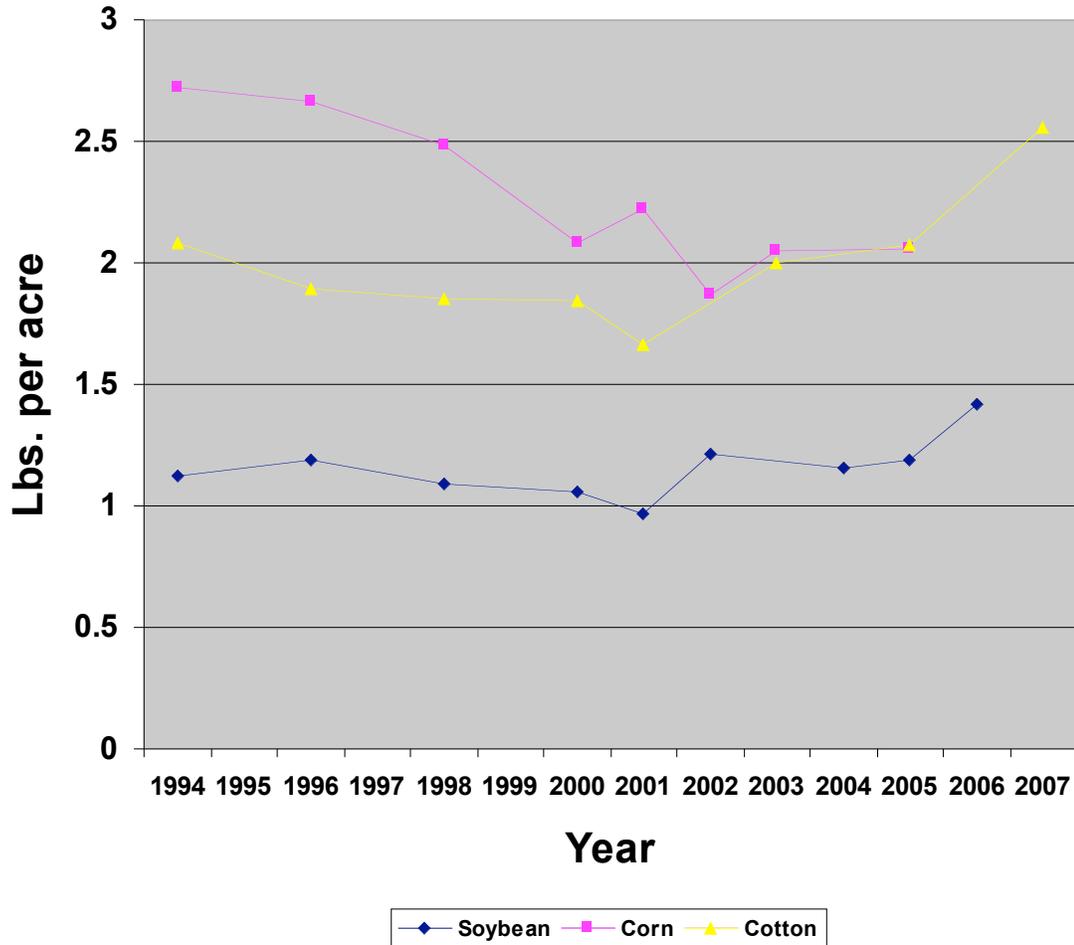




Appendix 3

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



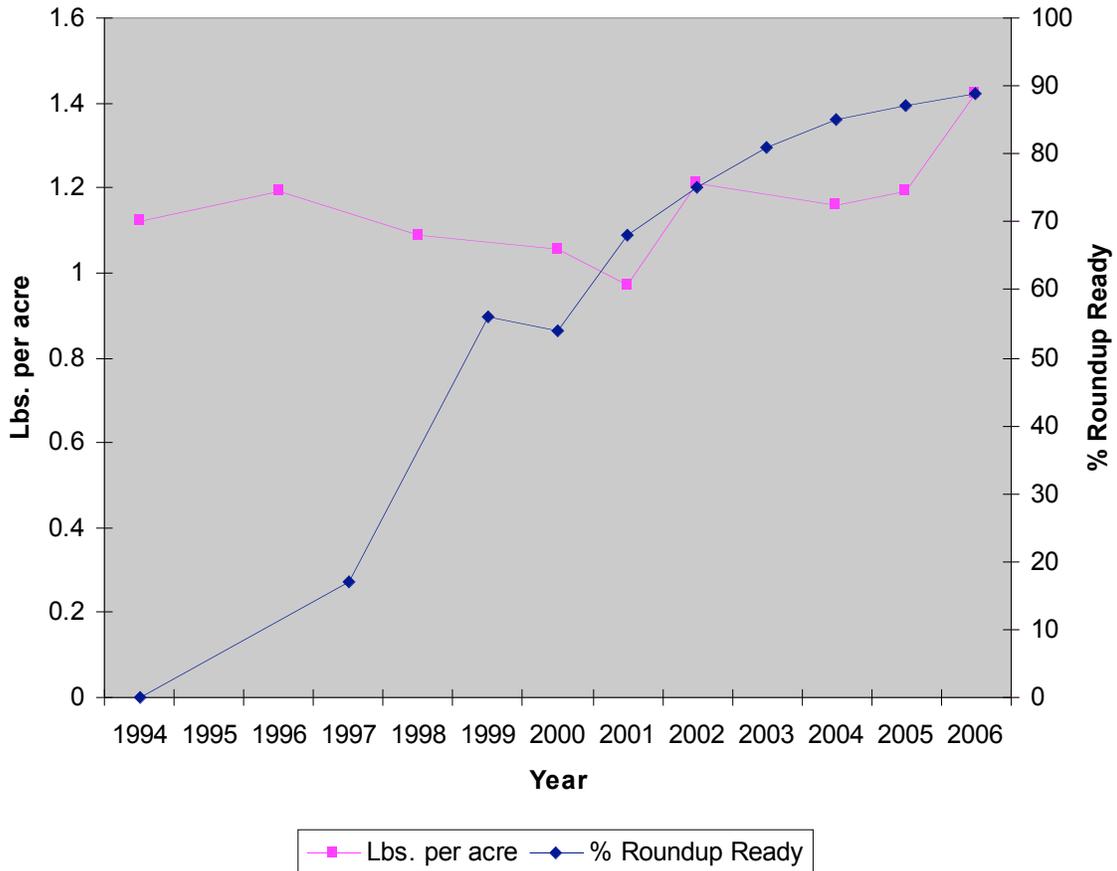
Notes: Intensity of herbicide use began rising in 2002 for soybeans and cotton, and in 2003 for corn, as herbicide-tolerant versions of these crops became prevalent.

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.



Appendix 4

Soybean Herbicide Intensity vs. Roundup Ready Soybean Adoption



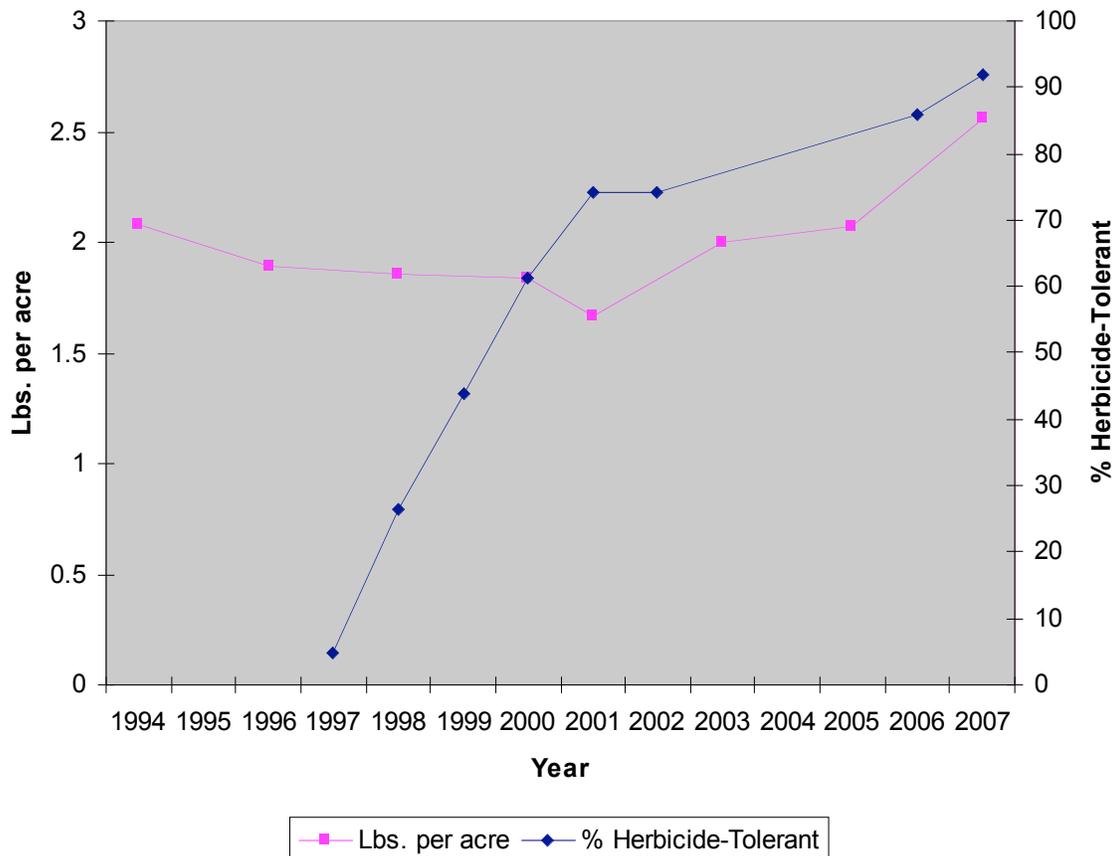
Notes: All herbicide-tolerant soybeans are Roundup Ready. RR soy represents by far the most widely planted HT crop. Note the large spike in herbicide intensity beginning in 2002, as Roundup Ready soybean adoption grew to exceed 70% of all soybean acres planted. While correlation is not causation, this large spike in herbicide intensity corroborates the findings of Benbrook (2004) presented on page. 3.

Sources: For herbicide use, see: “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>. See notes under “Sources” on page 7 for details. For percentage of overall soybean acreage planted to herbicide-tolerant soybeans (all Roundup Ready), see: USDA’s Economic Research Service (ERS), see: <http://www.ers.usda.gov/Data/BiotechCrops/alltables.xls>.



Appendix 5

Cotton Herbicide Intensity vs. Herbicide-Tolerant Cotton Adoption



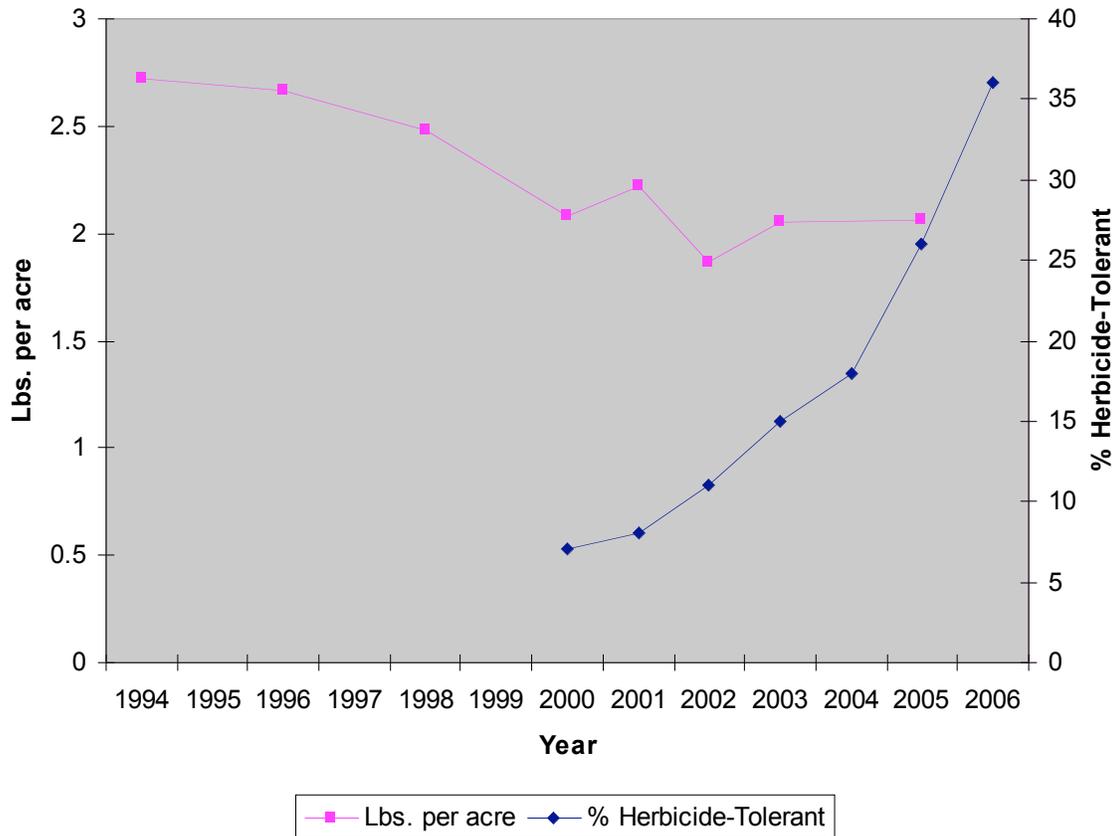
Notes: Note the substantial spike in herbicide intensity beginning after 2001, as herbicide-tolerant upland cotton adoption rose to exceed 70% of all upland cotton planted. While correlation is not causation, this substantial spike in herbicide intensity corroborates the findings of Benbrook (2004) presented on page 3. In 2006, 96% of HT cotton was Roundup Ready, 4% was tolerant to glufosinate (LibertyLink).

Sources: For herbicide use, see: “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>. See notes under “Sources” on page 7 for details. Percentage of overall upland cotton acreage planted to herbicide-tolerant cotton from USDA’s Agricultural Marketing Service (AMS), which has more reliable statistics on cotton than USDA’s ERS. For 1997-2002, see AMS data cited in: May, O.L., F.M. Bourland and R.L. Nichols (2003). “Challenges in Testing Transgenic and Nontransgenic Cotton Cultivars,” *Crop Science* 43: 1594-1601. <http://crop.scijournals.org/cgi/reprint/43/5/1594.pdf>. Figures calculated by adding all HT varieties in Table 1. For 2006, see: USDA AMS data in: “Cotton Varieties Planted: 2006 Crop” http://www.ams.usda.gov/cottonrpts/MNXLS/mp_cn833.xls. This figure was calculated by adding percentages of all HT varieties (those with designations R, RR = Roundup Ready or RF = Roundup Ready Flex and LL for LibertyLink). Note that in 2006, 96% of HT cotton was Roundup Ready (Flex); 4% was LibertyLink.



Appendix 6

Corn Herbicide Use vs. Herbicide-Tolerant Corn Adoption



Notes: Herbicide intensity in corn began to rise modestly in 2003, but is expected to continue increasing as adoption of herbicide-tolerant corn (mainly Roundup Ready corn, though some LibertyLink corn is also grown) continues its dramatic rise. While correlation is not causation, this increase in herbicide intensity corroborates the findings of Benbrook (2004) presented on page. 3.

Sources: For herbicide use, see: “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>. See notes under “Sources” on page 7 for details. For percentage of overall corn acreage planted to herbicide-tolerant corn, see: USDA’s Economic Research Service (ERS), at: <http://www.ers.usda.gov/Data/BiotechCrops/alltables.xls>. Figures are the sum of percentages listed for “herbicide-tolerant only” and “stacked gene varieties.” As defined by ERS, stacked gene varieties always contain an HT trait.