

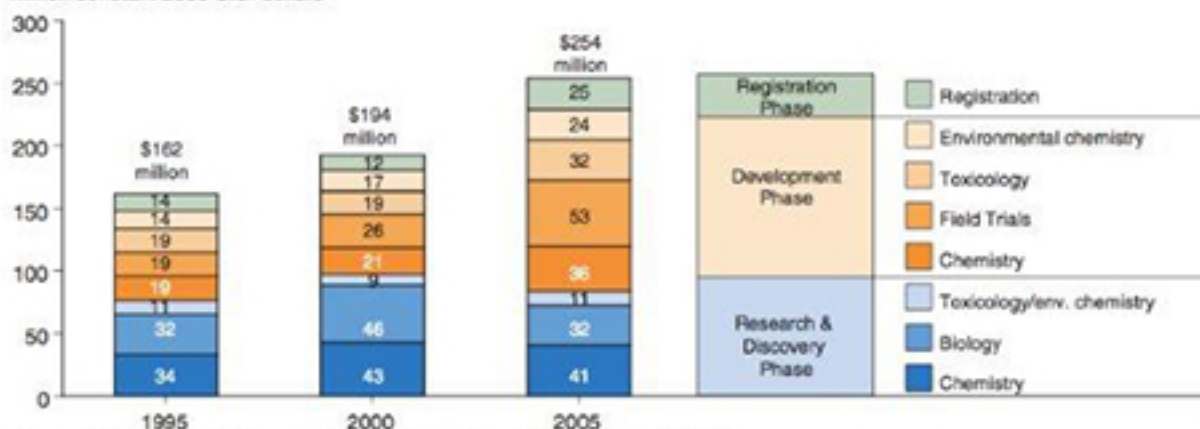
New product registrations

The shift away from discovery expenses may stem in part from the growing difficulty of finding novel active ingredients that address unmet crop protection needs at a competitive price. Although crop pests constantly adapt to their environment and can eventually develop resistance to crop protection strategies, the cumulative effort of decades of crop protection R&D has produced effective, inexpensive solutions. Hartnell (1996) describes a “golden age” of agricultural chemical discovery in the mid-20th century characterized by rapid introduction of new active ingredients that overlapped with the reduction in crop losses from pests in the United States to as low as 3 percent per year (Chambers and Lichtenberg, 1994). The number of new active ingredients introduced in EPA pesticide registrations in the United States peaked at about 40 per year in the 1960s and has subsequently fallen to less than 10 per year every year since 1988 (fig. 3.4). The rate of introduction declined after cumulative research successes exhausted prominent commercial and techno-

Figure 3.3

Costs of bringing a new agricultural chemical to the market

Million constant 2006 U.S. dollars



Source: USDA, Economic Research Service using data from PhillipsMcDougall (2010).