



The skinny on a big problem...weeds

NewFarm.org readers respond to a web-based survey about weed management and tell how they deal with their weeds.

By Matthew Ryan, Stacy Duh, Dave Wilson and Paul Hepperly

Weed management research at The Rodale Institute:

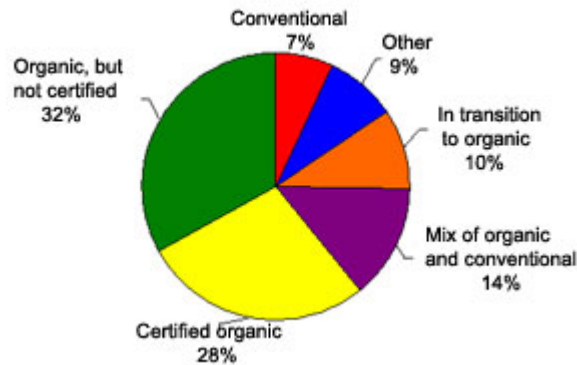
In the fall of 2004, The Rodale Institute entered into a research partnership with the USDA Beltsville Area Research Center's Sustainable Agricultural Systems Lab and Pennsylvania State University's Weed and Agroecology Lab to investigate integrated weed management for organic and sustainable farming systems.

As part of this collaboration, The New Farm has launched an [Integrated Weed Management page](#), where we'll be collecting online resources related to ecological weed management, and a [Weed Management discussion forum](#) where our readers can share questions and answers about practical strategies for better weed control on their farms. We'll also be reporting on the latest developments in weed ecology at [Beltsville](#), Penn State and elsewhere.

Enjoy! --Eds.

October 18, 2007: Organic farming is catching on in ways that few outside the organic farming community would have imagined only ten years ago. In our own area, organic farmland planted with corn and soybeans has increased 440 percent and 180 percent, respectively, from 1997 to 2005 (NASS 2007). With an unprecedented number of farms in transition or already growing organically, we thought it would be interesting to find out what NewFarm.org readers are doing to manage the pesky problem of weeds. Since initiating the survey in mid-March, we have received almost 600 responses from a variety of growers around the country. The results reveal a fascinating story about weed management practices, challenges and farmers' attitudes.

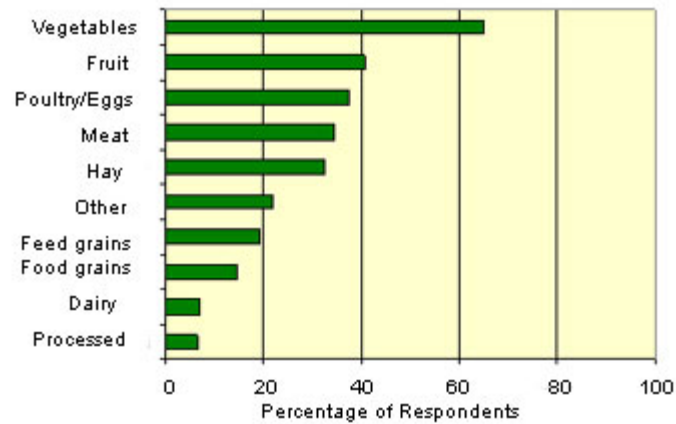
Demographics



Approximately 85 percent of the respondents indicated that they were farming organically or in transition to organic production. Although this sampling does not represent the entire farming community, it indicates that NewFarm.org readers are no strangers to innovative and alternative farming practices. More than 60 percent of the respondents indicated that farming was their primary occupation. We were impressed with this response, given the tendency of farmers to be employed off the farm.

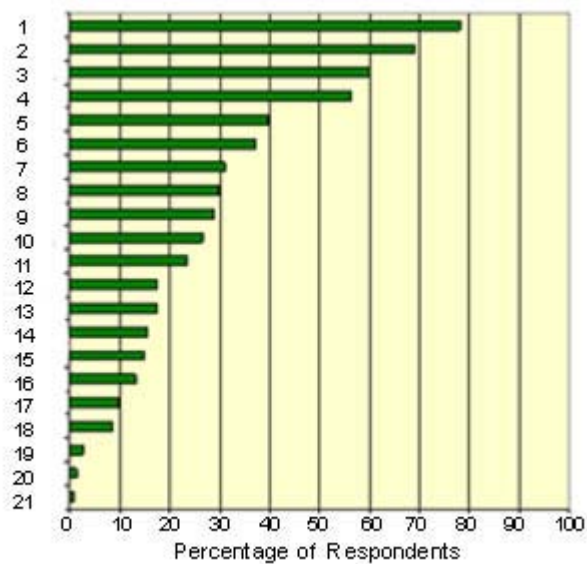
More than 64 percent of the respondents were between 40 and 59 years of age, indicating the likelihood that organic farming is coming to be accepted by more seasoned farmers. However, when compared to the respondents who stated that they were farming conventionally (with chemicals), the organic farmers tended to be slightly younger and were more likely to be female. Respondents reported farming almost 110,000 acres combined, with farms ranging in size from a quarter of an acre to more than 6,000 acres, with an average farm size of about 200 acres (and a median of 35 acres).

Foods you grow



A variety of diverse cropping systems were represented, with 65 percent of respondents indicating they grow vegetables, 41 percent growing fruits, 19 percent growing feed grains and 15 percent growing food grains. Many respondents also reported dairying, poultry and meat production and processed goods / value-added production as components of their farming operations.

Practices you use



1: Hand weeding, 2: Mechanical control, 3: Mulches, 4: Fall/Spring cover crop, 5: More than 3 crops in rotation, 6: Manage crop density, 7: Resting periods in rotation, 8: Row width adjustment, 9: Fertility management, 10: Flaming, 11: After planting date, 12: Stale seedbed, 13: Herbicide, 14: Other, 15: Rotation with perennials, 16: Alternating perennial and annual crops, 17: Solarization, 18: Weed tolerant crop cultivar, 19: GMO technology, 20: Night tillage, 21: None of the above.

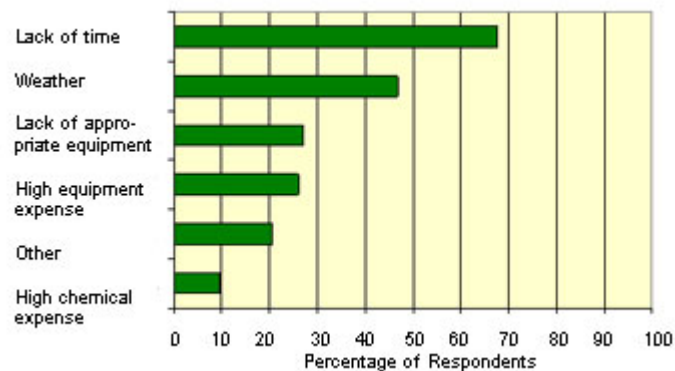
Successful organic farming isn't achieved simply by input replacement, but rather requires a whole-systems approach. This is clearly borne out in the survey results as 85 percent of respondents indicated that they use at least three practices, and on average identified six highly integrated strategies to manage weeds on their farms. Hand weeding, probably the most labor intensive practice mentioned, was also the most common. Many successful farmers, like Anne and Eric Nordell of [Beech Grove Farm](#) in Trout Run, Pennsylvania, will put in extra effort with different management practices such as following fields with

summer cover crops and stale seed bedding for the primary purpose of reducing the labor required for hand weeding.

Mechanical control practices were listed as the second most common strategy among respondents. Almost half the respondents reported using between-row cultivation, many of them listing cultivator types representing a range in size and style. There is a certain art to cultivation, a practice which can quickly turn ugly if you're not paying attention. Klaas and Mary-Howell Martens do a great job of explaining some of the intricacies of cultivation in their three-part article [Look, Ma! No Weeds: Early Season Weed Control](#). Other physical weed-control strategies include mulching, flame weeding and stale seed bedding.

Experienced organic farmers know that cultural practices, tactics that increase crops' ability to compete against weeds, are the foundation of successful organic weed-management programs. Cultural practices were also very common among respondents. Over half of those surveyed use cover crops as a weed management tool, and approximately 40 percent have diverse rotations in place to help manage weed populations. Between 20 percent and 40 percent of respondents stated that they adjust seeding rates and row width, manage fertility wisely and alter planting dates to give crop plants a competitive advantage. The most common weed-management practice not listed above, but mentioned by 6 percent of respondents, was animal grazing.

Challenges you face

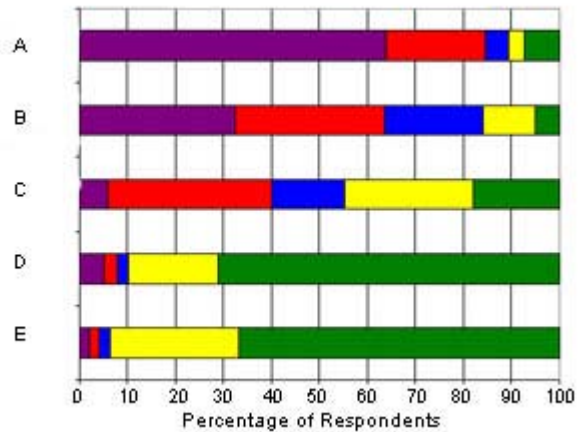


“Lack of time,” reported by 68 percent of farmers surveyed, was the top challenge to effective weed management. This is a serious issue that deserves some attention. As growers, we should strive to formulate weed management plans with as much focus on efficiency as on effectiveness. There’s nothing worse than having a perfect window of opportunity for cultivation and just not having enough hours in the day.

“Weather conditions” was the next major obstacle, cited by almost half of participants. Successful weed management is often highly dependent on the timing of practices, particularly for organic farmers. Poor weather can delay or prevent some management practices from occurring. Furthermore, early-season mechanical controls like rotary hoeing and tine cultivation are adversely affected by rainfall after they have been applied because moisture at the wrong time can prevent seedling desiccation, allowing them to re-root.

Farmers also had issues with equipment, with more than 25 percent of respondents reporting that “lack of equipment” and “high expenses for equipment” were challenges to successful weed management. Other constraints and challenges specifically mentioned included a lack of knowledge and expertise in the area of weed management and also labor-related issues, from high labor costs to a lack of skilled labor.

Your attitudes toward organic weed management



Purple = Strongly disagree; Red = Disagree; Blue = No Sure; Yellow = Agree; Green = Strongly Agree.

A: Organic farming is no better for the environment than conventional farming. **B:** Organic weed management practices cannot be as effective as conventional, chemical-based ones. **C:** Weed management is my number one production constraint. **D:** I am concerned that the use of chemicals in farming is a health risk to me and my family. **E:** Farming is not just a job for me, it is a way of life.

As part of the survey, we asked respondents to indicate whether or not they agreed with a series of statements in order to better gauge farmers' attitudes toward farming and weed management. A strong sense of passion was reflected, with a large percentage of respondents agreeing with the statement that: "Farming is not just a job for me; it is a way of life." The second strongest response was in agreement with the statement: "I am concerned that the use of chemicals in farming is a health risk to me and my family."

There was not strong consensus with regard to the statement: "Weed management is my number one production constraint." More people either strongly agreed or agreed with the statement than strongly disagreed or disagreed, indicating that weed management is the top production constraint faced by approximately 50 percent of the responding farmers. Most respondents disagreed with the statement: "Organic weed management practices cannot be as effective as conventional, chemical-based ones." With regard to farmers' attitudes toward the effect of farming system on the environment, respondents strongly disagreed with the statement: "Organic farming is no better for the environment than conventional farming."


Conclusions

Previous surveys of farmers using organic and sustainable practices have yielded similar results. One of the most illuminating is [Final Results of the Third Biennial National Organic Farmers' Survey](#), published by the Organic Farming Research Foundation (OFRF) in 1999. Although the fourth survey was published in 2004, the 1999 survey is particularly interesting because it asked farmers what they considered to be research priorities and about their weed management practices.

Sending a clear message to researchers and program funding directors, responding farmers ranked weed management to be their first research priority. The top three practices, "mechanical

tillage,” “weeding by hand or with hand implements,” and “crop rotation,” were listed as being used by 75 percent of the respondents frequently or regularly. It was also clear from the OFRF survey that organic farmers use a multitude of different weed management practices and are hungry for more information.

In the eight years since the OFRF survey, we can see that there are still some weed management challenges to overcome. Our 600 respondents tell us that organic weed management can be effective, and that although weeds are a serious production constraint for many, effective strategies can be developed through the integration of multiple tactics.

We thank all of the participating farmers for their time and thoughtful responses to our survey. 

This research was supported by a collaborative project funded by the USDA-ARS grant entitled “Biologically Based Weed Management for Organic Farming Systems” (project number 1265-22000-164-01).

The Rodale Institute is collaborating with The Pennsylvania State University (PSU) and the USDA Agricultural Research Service (ARS) to identify effective weed management techniques based on the use of a variety of practices rather than on chemical inputs. These include: cultural practices such as cover crops, timing of planting, timing of cultivation and evaluating different cultivars for weed tolerance. In addition, we are conducting trials to identify the weed dynamics in organic systems compared to conventional systems.

The goals of this project are to: 1) assess the ability of these cultural practices to control weeds 2) refine the practices for greater effectiveness, and 3) provide information on these techniques to farmers and extension agents. Field research for this project is currently being carried out in Pennsylvania at The Rodale Institute and at The Pennsylvania State University, in Maryland at the USDA ARS Beltsville research station, and at collaborative farms in the northeast region.

We would like to thank and acknowledge Dave Mortensen, PhD, from the Weed Ecology Laboratory at The Pennsylvania State University and John Teasdale, PhD, from the USDA ARS Sustainable Systems Laboratory for their contributions to this survey.

Any opinions, findings, conclusions, or recommendations expressed in this publication are those of the author(s) and do not necessarily reflect the view of the U.S. Department of Agriculture.