

## 2016 Report of Florida Priorities

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### Characteristics of respondents

Slightly over half of respondents were from North Florida. The Central and South Florida areas where specialty crop production is most prevalent may therefore be under-represented in this sample.

Nine of 13 respondents work for either a federal agency (mostly NRCS) or for a University in either a research or extension capacity. The results therefore are not indicative of how other agricultural professionals, including farmers, would prioritize these areas for further research and outreach.

Most respondents work with horticultural crops in some combination of vegetable crops, annual fruit crops and perennial fruit crops. Nearly half work with agronomic crops as well and nearly half also work with ornamental crops. Those who work with agronomic crops are more likely to work with livestock production systems as well.

### Barriers to adoption by farmers who do not currently use cover crops

Respondents were asked to identify the three most important barriers that keep farmers who do **not currently use cover crops** from using them. Respondents were asked to check not applicable if they had no experience with “non-users.” Four said they had no experience. The respondents with experience with non-users checked three of twelve possible barriers (Table 1). These barriers for Florida farmers were identified in previous research about cover crops with farmers in Florida. Three barriers were selected most frequently.

Two-thirds (six) of the respondents who have experience working with non-users of cover crops said that timing the establishment and termination of the cover crops in the cash crop cycle is a barrier. There are typically two cropping seasons for annual horticultural crops in Florida and the warm season is the off-season for most farmers. Therefore, it is not surprising that this is the most common response. Prior on-station and on-farm research has also shown how important this barrier can be and clearly demonstrated the need for more research to generate reliable recommendations for the many specific production systems in the state.

The second most frequently mentioned barrier (five of nine respondents who have experience working with non-users of cover crops) was that farmers are not convinced of the long-term benefits of cover crops on soil health. With the exception of organic soils and some soils in the Florida Panhandle, Florida soils are sands. High temperatures and the semi-tropical climate in Florida also distinguish growing conditions from those of much of the nation. Florida farmers are well aware that data from research conducted elsewhere with soils that have higher organic matter content, more stable structure, and better water-holding capacity are not likely to be useful for Florida conditions. The need for long-term research both on-farm and on-station in Florida, and probably in the entire Southeastern Coastal Plain sub-region is reflected in this result.

Four of the nine respondents who have experience with non-users said that a major barrier to adoption is that cover crops are not an effective alternative to chemical pest control. All other barriers indicated in Table 1 were identified by only one or two respondents who have experience working with non-users of cover crops.

**Table 1. Reasons why non-users do not adopt cover crops in Florida**

Item	No. Times Selected
Overall annual cost of planting & managing cover crops	2
Cost of buying and maintaining equipment needed	1
Hard to time establishing and terminating the cover crop with the cash crop cycle	6
Difficulty dealing with cover crop residue as organic mulch OR when preparing to install plastic mulch	1
Insufficient information available about nutrient budgets	1
Not enough good cover crop varieties for Florida conditions	1
Not convinced of the long-term benefits of cover crops on soil health	5
Insufficient information about the effects of using cover crops on diseases and pests	2
Does not provide an effective alternative to chemical pest control	4
The change is complex and seems overwhelming to farmers	2
Not enough long-term studies and data to justify the changes in practice	1

**Challenges to farmers who do use cover crops**

Respondents were asked to identify the three most important challenges that face farmers who **do currently use cover crops**. Eight of the eleven options were the same as those provided for the previous question regarding barriers to adoption for non-users. Table 2 provides the list of choices. There is greater variance in these responses, but there are also some strong commonalities between the two sets of responses.

Just as was true for non-users, the most commonly selected option was that timing the establishment and termination of cover crops in the farmers' annual cropping cycle is a challenge. Seven of the respondents made this selection. Another similarity had to do with the long-term benefits of using cover crops. Five respondents said that farmers "do not see the anticipated long-term benefits of cover crops on soil health."

There were two other major challenges for users of cover crops that were distinctive from the barriers for non-users. One was the annual cost of planting and managing the cover crops. Experienced growers involved with the University of Florida in cover crop research have consistently identified this as a constraint. The difference in response may be due to the fact that the non-users cannot adequately assess the costs. Another frequent response regarding challenges to experienced users was the need for varieties specific to Florida. This, too, is a research need that has been identified in the prior work in Florida. The other challenges were mentioned less consistently (Table 2).

**Table 2. Challenges faced by users of cover crops in Florida**

Item	No. Times Selected
Annual cost of planting & managing cover crops	6
Cost of buying and maintaining equipment is too high	3
Timing the establishment and termination of the cover crop with the cash crop cycle	7
Difficulty dealing with cover crop residue as organic mulch OR when preparing to install plastic mulch	2

Finding good information available about nutrient budgets	4
Finding a good cover crop variety (or varieties) for his/her farming system	4
Does not see the long-term benefits of cover crops on soil health	5
Managing diseases and pests	2

### Top Priority Research Areas

We asked respondents to rank six general areas for research. Table 3 indicates how often each of these six areas was ranked in the top three by the respondents. By far most commonly in the top three priorities was research about the effects of cover crops on the soil, including nutrient and water management, ranked number 1, 2 or 3 by 12 respondents. This clearly reflects what we saw in the responses about barriers to non-users and challenges to users of cover crops, e.g., lack of confidence in the long-term soil benefits for non-users and not seeing the anticipated benefits for users.

Other results are less reflective of the responses about barriers and challenges. Somewhat surprising, pest, weed and disease management, including beneficial organisms, was ranked in the top three by eight respondents although this general topical area was not a frequently indicated barrier for either non-users or users. The economics of using cover crops was the third most commonly cited general area of research needed. This is consistent in particular with the importance of the cost of planting and managing cover crops in the challenges for cover crop users. Similarly, breeding and selection of cover crop varieties and/or mixtures for Florida was the fourth most frequent item to appear in the top three, and this was a commonly cited challenge for users. The other two areas for research were rarely cited in the top three priority research areas.

**Table 3. General research priorities**

Item	No of Times in Top Three Choices
Breeding and selection of cover crop varieties and/or mixtures for Florida	5
Effects of cover crops on the soil, including nutrient and water management	12
Pest, weed and disease management, including beneficial organisms	8
Economics of using cover crops	6
Cover crop management practices	2
Integrating cover crops into livestock operations, including grazing cover crops	1

### Top Priorities for Outreach

Respondents ranked six general types of activities for Extension and other outreach agents (Table 4). Of those, only three were consistently ranked highly (first, second or third). Two – on-farm demonstrations and/or trials and field days were highly ranked by eleven respondents. There are some differences between the two, however, On-farm demonstrations or field days were ranked first by nine and second by two whereas field days were ranks first only once, but were ranked second by six and third by four respondents. Whatever the differences, the data clearly indicate the preference for on-farm demonstrations and trials and for field days. A website that is “one-stop shopping” for information on cover crops in Florida was the other item

that was highly ranked, in the top three for nine of the respondents. The other three items were rarely ranked in the top three and workshops and other training about cover crops for Extension agents, certified crop consultants and other technical advisors was never in the top three.

**Table 4. Outreach priorities**

Item	No of Times in Top Three Choices
On-farm demonstrations and/or trials	11
Field days	11
Website that is “one-stop shopping” for information on cover crops in Florida	9
Workshops and other training about cover crops for farmers	3
Workshops and other training about cover crops for Extension agents, certified crop consultants, and other technical advisors	0
Printed information (fact sheets, manuals, newsletters, etc.	3

### **Specific Areas for Research and/or Outreach from Cover Crop Conference**

We also provided respondents with the list of topics for research and outreach identified at the Southern Region Cover Crops Conference. There were 14 specific topics on that list (Table 5). We asked respondents to select their top five priorities. We then summed the number of times each topic was among the top five selections. We report the results here in three groupings. The high priority grouping consists of topics that were selected as priorities by seven to nine of the respondents. The moderate priority grouping consists of those selected by four to six respondents. The low priority grouping consists of items selected by three or fewer people.

The high priority grouping includes five topics which in many ways reflect the findings regarding challenges to users and general priorities for research. The economics of cover crop production and varietal selection were both selected by nine people. The economics choice reflects the challenge to users regarding the costs of planting and managing cover crops, and the need for more varieties appropriate for Florida conditions was also a commonly mentioned constraint for users. Similarly, the selection of how cover crops affect soil biology and health over the short and long term, with eight responses, reflects the concerns of both experienced users and of non-users about long-term benefits to the soil. The other two items in this grouping, each selected by seven respondents, were nutrient management in cover crops and using cover crops for nematode management. The former reflects the challenge to users of not having nutrient budgets while nematode management is a more specific example of the pest management category that scored highly among the general areas for research. In summary, this grouping largely reflects the challenges and needs for research identified in other parts of the questionnaire.

The moderate grouping strongly reflects the general research need regarding pest management. Three of the four items in this group – using cover crops for weed management, for disease management, and to manage beneficial insects – provide us with more specific guidance regarding the research and outreach needs. The other item in this group, cover crop establishment, termination and residue management, was the number one item cited as a barrier to adoption of cover crops by non-users and the number one challenge to users.

The low priority grouping includes three items. One is insect pest management, which again reflects the general research area that was identified. Nonetheless, given these results, this would appear to be a lower priority than weed, disease, or nematode management. More in-

depth discussion with growers may explain this somewhat inconsistent result. One of the other two items, cover crop seed production to reduce cost and/or increase availability is a concern that is relevant to the more general need to address the economics of cover crops use. Water management with cover crops was mentioned by two respondents and does not seem related to other issues, although on Florida's sandy soils, water and nutrient management (high priority) are highly related. None of the respondents selected multiple uses of cover crops.

**Table 5. Specific topics for research and/or outreach, by priority grouping**

Item	Grouping
Using cover crops for nematode management Economic costs and benefits of cover crop use How cover crops affect soil biology and health over the short and long term Nutrient management with cover crops Cover crop varieties for Florida, including specific varieties and mixtures	High Priority
Using cover crops for weed management Using cover crops for disease management Using cover crops to manage beneficial insects, including pollinators Cover crop establishment, termination and residue management	Moderate Priority
Using cover crops for insect pest management Water management with cover crops Cover crop seed production to reduce cost and/or increase availability Other	Low Priority
Multiple uses of cover crops such as grazing or harvesting a cash product	Never Selected

### Summary

Overall there are many consistencies among the responses to the various topics covered in this questionnaire. We identified five primary themes that emerge regarding barriers to adoption of cover crops by non-users, challenges to users, and general and specific research needs to address the barriers and challenges. Research needs with regard to pest management were clearly identified. This was identified as a general research need, one of the top priority specific research topics, and three of the moderate priority research topics dealt with pest management needs. Another need that was identified repeatedly had to do with benefits of cover crops on soil health and biology, both over the short and long term. Respondents reported that a barrier to adoption by non-users is that they are not convinced of the long-term benefits of cover crops on soil health and they also said that users do not see the anticipated long-term benefits on soil health. Not surprising, the effects of cover crops on the soil was identified both as a general research need and as a specific research need. The need for nutrient budgets was also identified as a challenge for users. Taken together, these results show that this is another high priority area to address in research and outreach. The difficulty of managing cover crop establishment, termination and residues emerged as a barrier to adoption, a challenge for experienced users, and a moderate priority specific research need. Florida's winter production season and multiple planting seasons in much of the state complicate these decisions for growers. Overall, the economics of cover crop use also emerged as both a concern and a high priority specific research topic. This finding points to the importance of incorporating economic evaluation into both research and extension activities. Finally, not surprising given the combination of soils, climate, and cropping systems in Florida, a top priority specific research topic was breeding and selection of both cover crop varieties and mixtures. Given that on-farm demonstrations and/or trials and field days were the two top priorities for Extension activities, an

integrated approach in which on-station research is extended to on-farm trials is clearly important. It will also be critical to create field days and other educational venues where the high priority needs identified above are addressed in depth. The concept of a “one-stop shopping” website is also a priority for outreach and the needs and opportunities identified through these responses may serve as a way to organize the information in that venue.