

# Current State of Row Crop Weed Management in South Dakota



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## Introduction

Weeds are a serious pest in South Dakota row crop production. Weeds can reduce crop yield and decrease harvest efficiency. Herbicides have been the primary tactic to manage weeds. Overreliance on herbicides has selected for resistant weeds, such as glyphosate-resistant kochia and waterhemp. Herbicide resistance increases the cost and complexity of weed management in row crops. While there are other nonchemical tactics available to manage weeds, there is little data available to suggest what other tactics South Dakota agricultural stakeholders utilize. Tillage used to be widely adopted throughout the state, but no-till farming is more common for soil conservation. Other cultural practices such as cover crops and narrow spacing is likely utilized in some areas of the state. False assumptions about weed management in South Dakota row crops could result in the development of ineffective programs, further increasing costs. South Dakota is a diverse state, with different climates, ecosystems, species, and control tactics throughout that can influence weed management. Due to this diversity, an online survey was developed and distributed to determine how South Dakota stakeholders are currently managing row crop weeds.

## Methods

An [online survey](#) (Figure 1) was distributed via the SDSU Extension Pest and Crop Newsletter and other e-mail list serves in 2023 and 2024. The survey consisted of ten questions regarding row crop weed control (Table 1). The responses were prepopulated so the respondent could select the desired response(s). Select questions allowed for the respondent to select "other" and type in a response to encompass responses not listed. The online format of the survey allowed the respondents to complete the survey at their own convenience. The survey is recurrently redistributed via the SDSU Extension Pest and Crop Newsletter and by word of mouth. The survey is still "live" and we encourage more stakeholders to complete the survey for more information.



**Figure 1.** Scannable QR Code leading to the South Dakota Row Crop Weed Survey.

**Table 1.** The questions asked on the South Dakota row crop weed survey.

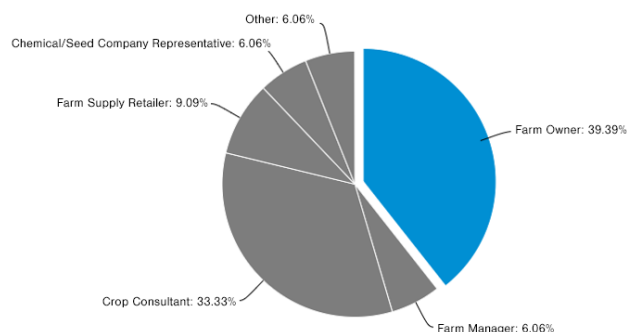
Questions	
1.	How would you classify your role in agriculture?
2.	Where is your home county?
3.	How many acres are you farming or managing?
4.	What crops are in your current rotation?
5.	Where does weed control rank for you?
6.	How do you currently control weeds?
7.	How satisfied are you with the control of your weeds with the previously answered control methods?
8.	What are the troublesome weed(s) in your field(s)?
9.	What other weed management tactics would you consider implementing?
10.	What would you consider a barrier for adoption for implementing new noxious weed control strategies?

## Results

Currently, 477 stakeholders have opened the survey but only 35 stakeholders completed the survey: a 7% completion rate.

### How would you classify your role in agriculture?

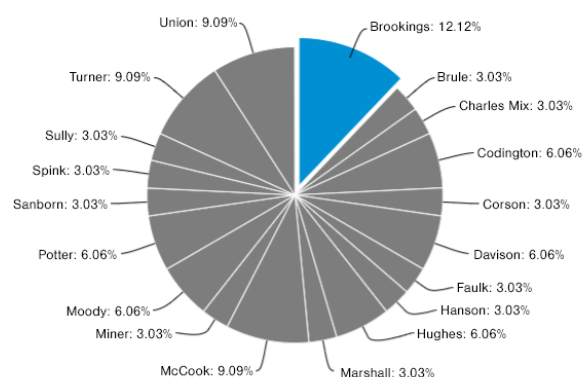
Most respondents classified themselves as a “farmer” (39%) or “crop consultant” (33%) (Figure 2). All other classifications (farm manager, farm supply retailer, chemical/seed company representative, other) were less than 10% of the total respondents (Figure 2).



**Figure 2.** Respondent's role in agriculture for the 2023-2024 row crop weed control survey.

### Where is your home county?

Currently, 19 out of the 67 counties in South are represented in the survey responses (Figure 3). East River counties were more represented than West River counties (Figure 3). This result is not unexpected as more row crop production occurs East River.



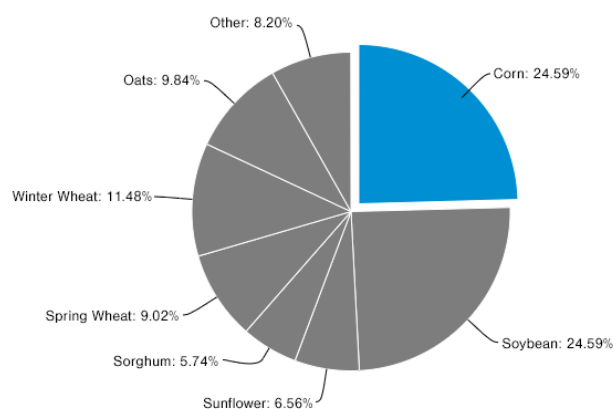
**Figure 3.** Breakdown of respondent's home county for the 2023-2024 row crop weed control survey.

### How many acres are you managing?

Responses ranged from 2 to 86,000 acres managed. The average land area managed was 15,576 acres. The number of acres managed is high, likely attributable to the fact that crop consultant respondents manage multiple farms. The median acres managed was 4,000 acres which is likely a more realistic number to represent the acres managed by South Dakota stakeholders.

### What crops are in your current rotation?

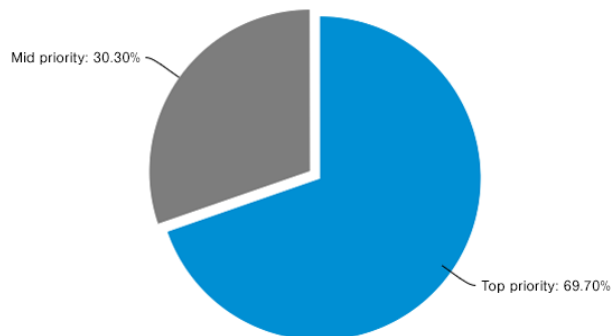
Corn (25%) and soybean (25%) were the most common crops grown (Figure 4). Winter wheat (12%) and oats (10%) were the next most common crops grown in the respondent's rotation (Figure 4). Sorghum, spring wheat, and “other” were represented less than 10% as grown in the current rotation (Figure 4). The write-in responses for “other” consisted mainly of alfalfa.



**Figure 4.** Crops grown in rotation of the respondents of the 2023-2024 row crop weed control survey.

### Where does weed control rank for you?

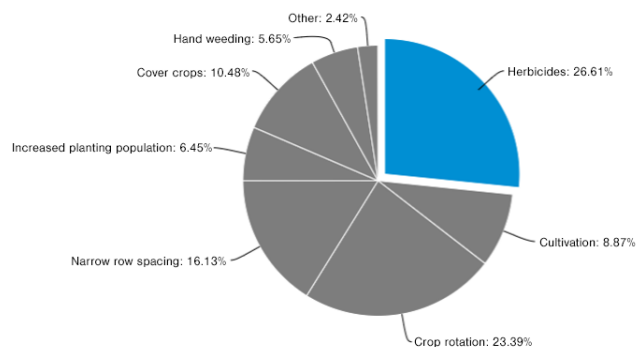
Seventy percent of the respondents ranked weed control as a top priority (Figure 5). The next common response was mid priority (30%), and no other responses (e.g., low priority and not a priority) were selected (Figure 5).



**Figure 5.** Ranking of weed control as a priority by the respondents of the 2023-2024 row crop weed control survey. Other available responses were not selected (low priority and not a priority).

### How do you currently control weeds?

Herbicides (27%) was the most common response followed by crop rotation (23%) then narrow row spacing (16%) (Figure 6). Cover crops and cultivation were utilized by approximately 10% of the respondents (Figure 6). Increased planting population and hand weeding were the least utilized tactics (~6%) (Figure 6). The response “Other” (2%) did not have consistent write-in answers. On average, respondents use three methods to control weeds.



**Figure 6.** Tactics utilized to control weeds by the respondents of the 2023-2024 row crop weed control survey.

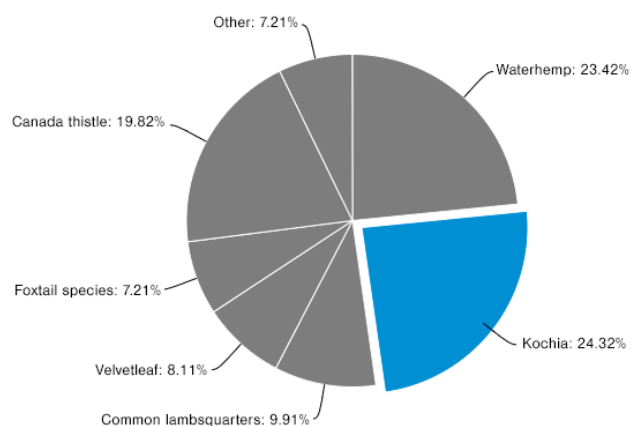
### How satisfied are you with the control of your weeds with the previously answered control methods?

Seventy-nine percent of the respondents were “somewhat satisfied” with previously answered control methods. Only 12% of the respondents were “completely satisfied” with previously answered control methods. Neither satisfied nor unsatisfied and

somewhat unsatisfied encompassed 6 and 3% of the responses, respectively. No respondent was completely unsatisfied.

### What are the troublesome weed(s) in your field(s)?

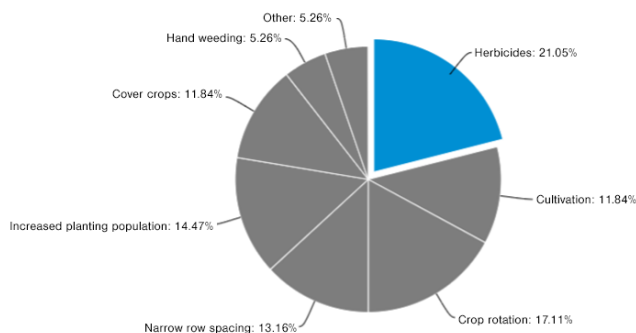
Kochia (24%) and waterhemp (23%) were the most common troublesome weeds reported followed by Canada thistle (20%) (Figure 7). Common lambsquarters (10%), velvetleaf (8%), and foxtail species (7%) were reported as troublesome at similar response levels (Figure 7). The response “Other” (7%) listed troublesome weed species as Palmer amaranth, sandbur, field bindweed, common milkweed, and Absinth wormwood. On average, respondents reported 3.5 troublesome weed species in their field(s).



**Figure 7.** The troublesome weeds in the field(s) of the respondents of the 2023-2024 row crop weed control survey.

### What other weed management tactics would you consider implementing?

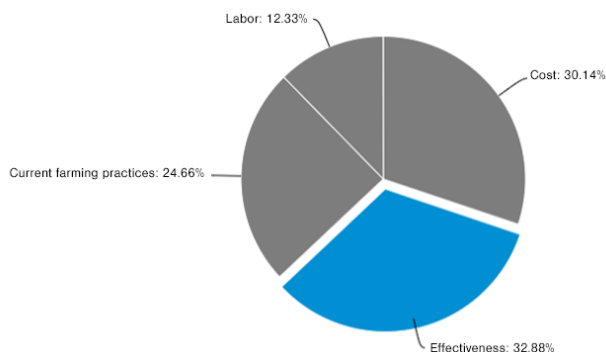
The responses for this question followed a similar pattern as the responses of the question “How do you currently control weeds?” (Figure 8). The response “Other” consisted of write-in answers of flaming and livestock grazing. On average, respondents would consider implementing four other tactics to manage weeds.



**Figure 8.** Other management tactics that would be considered by the respondents of the 2023-2024 row crop weed control survey.

### What do you consider to be a barrier of adoption for implementing new weed control strategies?

Cost, effectiveness, labor, and current farming practices were similarly selected by the respondents (25 to 33%) (Figure 9). Labor (12%) was the least common response (Figure 9). On average, respondents said there are two barriers of adoption.



**Figure 9.** The barriers of adoption for new control tactics by the respondents of the 2023-2024 row crop weed control survey.

### Conclusion

The results of the survey suggest that weeds are major problem in South Dakota row crops as suggested by 70% of the respondents listing weed management as a top priority. While herbicides are still the primary tool for control, the utilization of other tactics suggest that weeds are managed with an integrated approach using tactics already utilized in row crop production (i.e., crop rotation, cover crops and row spacing). Utilizing an integrated approach for weed management usually results in more effective control, which is exemplified with approximately 79% of the respondents “somewhat satisfied” with current control tactics. Herbicides were also listed as a “tactic” to be considered for future implementation. This result could be suggesting the application of that herbicides were not widely used in their current operation, utilization of different application timings, or the respondents will consider using herbicides again in the coming growing seasons.

While kochia and waterhemp were the most troublesome weeds, most likely due to resistance to

many herbicides, respondents reported multiple weed species were troublesome as well. This result suggests that management plans need to address a variety of weed species to be effective. As farming input and production practices increase, the result of cost as a barrier of adoption for implementing new tactics was not a surprise. Additionally, current production practices, such as no-till farming, likely provide a barrier for adopting new tactics that incorporate cultivation. While effectiveness will also be a barrier of adoption, utilizing multiple tactics together will likely increase management effectiveness rather than relying solely on one tactic such as herbicides.

The results from the survey, while insightful, would be improved with more responses to draw more concrete conclusion about the current state of row crop weed management. The authors encourage readers of this fact sheet to fill out the survey if they have not done so already. The results from this survey will be used to improve extension and research efforts by South Dakota State University.

### Acknowledgements

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