

## Introduction

- The first North Central Weed Science Society (NCWSS) annual meeting was held in 1945 in Omaha, NE
- The NCWSS has since become an annual tradition for Weed Science students and professionals in the public and private sectors from across the US North Central region
- The annual meeting proceedings include the abstracts of papers and posters presented each year, which likely reflect the current weed management challenges and research priorities faced by stakeholders and researchers in the NC region at the time of each meeting
- With advances in technology, the proceedings of the NCWSS annual meetings from 2001 onwards have become publicly available as a pdf document
- Our **OBJECTIVE** was to conduct a text analysis using the NCWSS annual proceedings to evaluate the major weed and herbicides being investigated by our society during 2001-2019

## Method

- Text analysis is the process of automatically classifying and extracting meaningful information from unstructured text
- The text analysis was completed in the R statistical software version 4.0.2 using packages corpora, tidyverse, tidytext, topicmodels, pdftools, and tm (Figure 1)

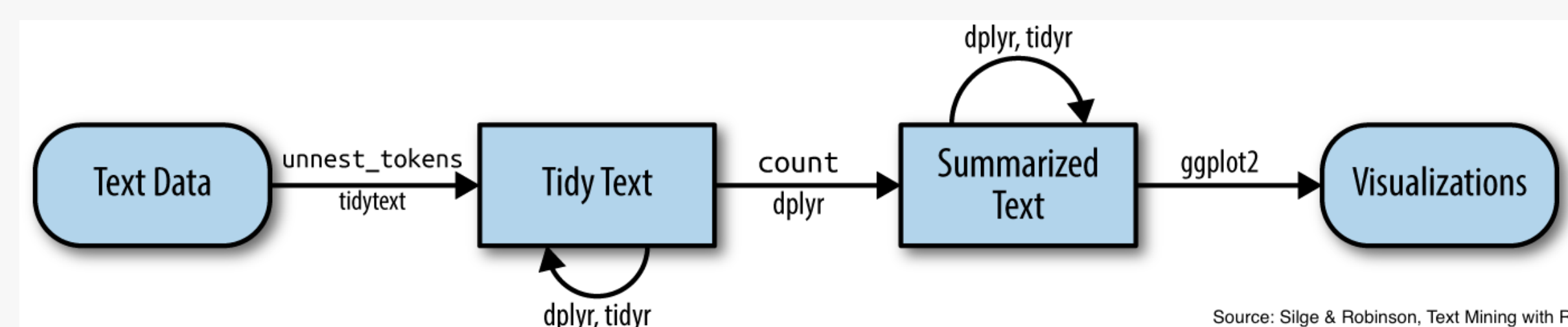


Figure 1: A flowchart of a typical text analysis using tidy data principles.

- The proceedings from each NCWSS annual meeting (pdf file) was imported into R, title and abstracts (from posters and papers) were processed with R functions to remove authors names, numbers, punctuation, and stop words (commonly referred to as the most common words in a language)
- The frequency of each word from each processed and cleaned NCWSS yearly proceedings were ranked from 1 to 100, being 1 and 100, the first and hundredth most frequent word in each annual proceedings, respectively
- We focused on two groups of words, "herbicides" and "weeds", that made the top 100 words in the NCWSS of 2001 and 2019

## Results

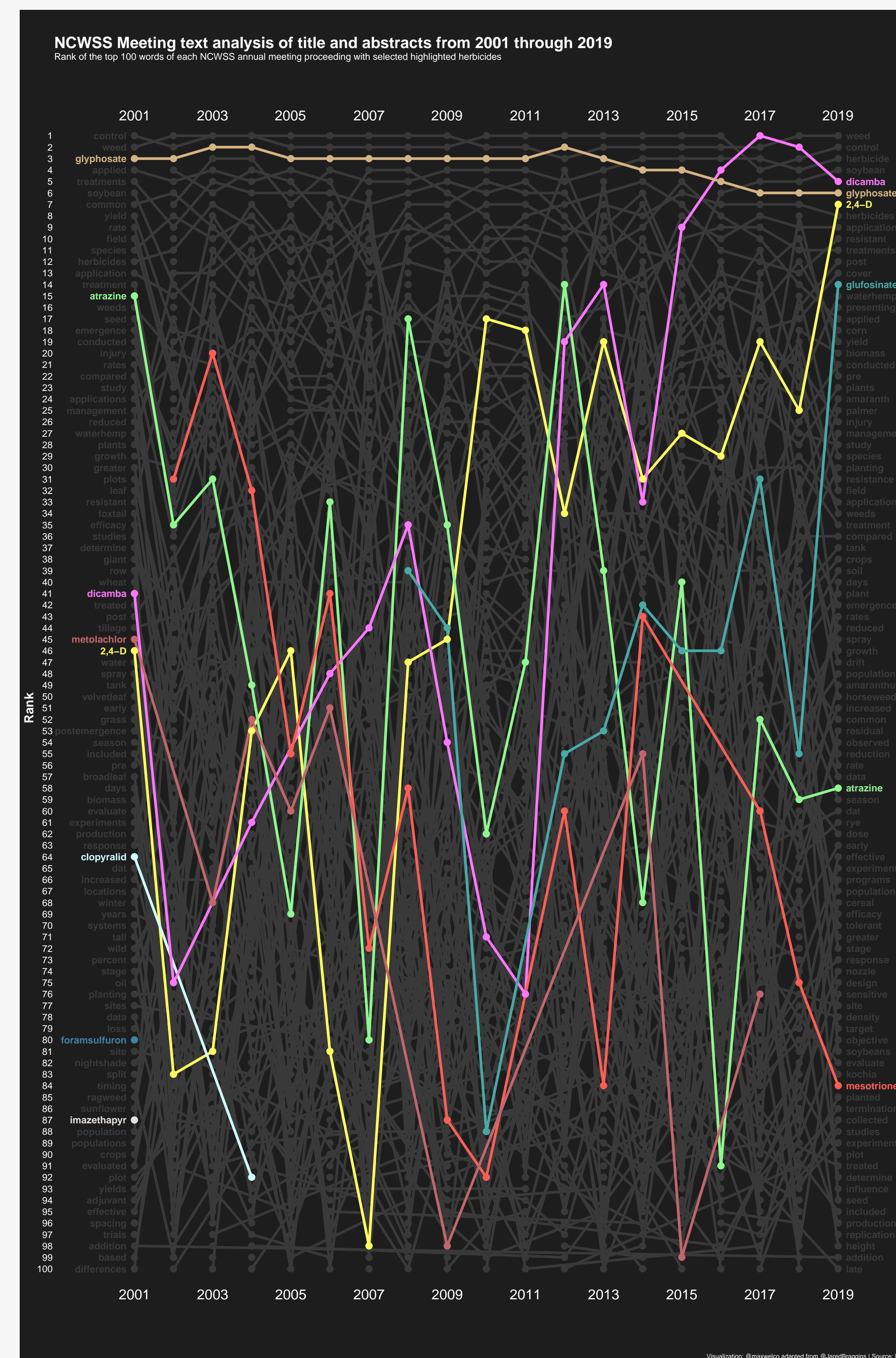


Figure 2: Rank of the top 100 words of each NCWSS annual meeting proceeding with selected highlighted **herbicides** from 2001 to 2019.

## Highlights

- From 2016 onwards, dicamba surpassed glyphosate as the top herbicide word in the NCWSS meetings. In 2019, dicamba is followed by glyphosate, 2,4-D and glufosinate (Figure 2)
- From 2001 through 2019, Palmer amaranth has joined the top 100 words with a steep increase, whereas velvetleaf, foxtail, and nightshade have left the top 100 words (Figure 3)

## Results

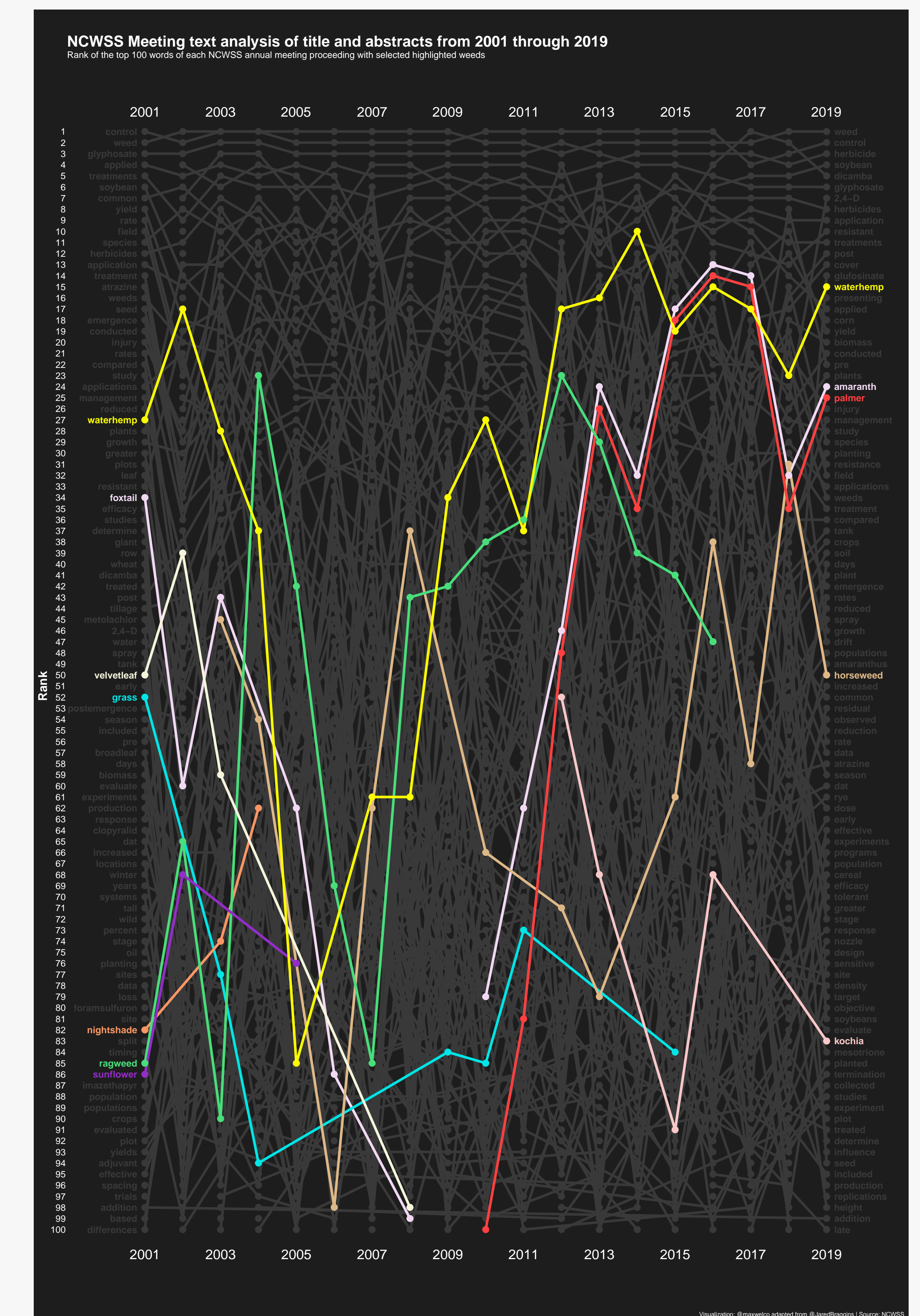


Figure 3: Rank of the top 100 words of each NCWSS annual meeting proceeding with selected highlighted **weeds** from 2001 to 2019.

## Conclusions

- Results presented here reflect the weed management challenges and research priorities across the NC region: management of species that have evolved resistance to several herbicide sites of action (e.g., waterhemp, Palmer amaranth, horseweed) and herbicides associated with the novel soybean herbicide tolerance traits (dicamba, glufosinate, 2,4-D)