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SOYBEAN FACTS

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Long-Term Management of Dandelion

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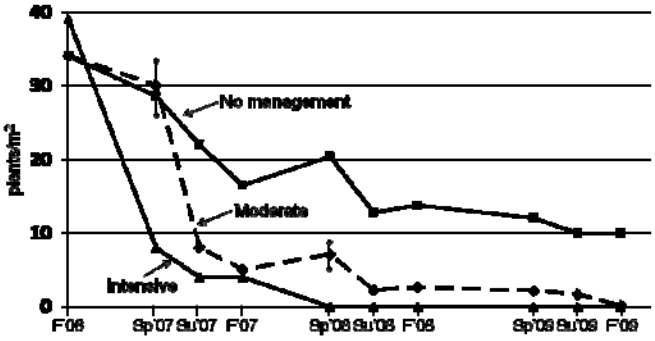
Dandelion continues to be a problem throughout many of Michigan's no-till fields. If not adequately controlled, high populations of dandelion can reduce corn and soybean yields by as much as 75%. Previous research funded by the Michigan Soybean Promotion Committee (MSPC) and the Corn Marketing Program of Michigan (CMPM) found that dandelion could be managed to reasonable levels with proper application timings and herbicide selection in no-till corn and soybean. However, even with these strategies in place control of dandelion rarely exceeded 85%, thus allowing dandelion to remain a problem for subsequent crops. Because dandelion still remains a long-term problem in no-till cropping systems, we have been building on previous research funded by the MSPC and CMPM to examine the population dynamics of dandelion in various management systems in a corn-soybean rotation over three years.

Long-term management in continuous no-till

Over time dandelion populations can be eliminated if proper control strategies are put in place. After three years, dandelion populations (established and seedling) have been eliminated in the intensively and moderately managed systems (Figure 1). However, the decline in dandelion happened at a quicker rate in the intensive management system than the moderately managed systems. The intensive management strategy included the use of fall, spring preplant, and postemergence (POST) applications of herbicides with dandelion activity. Moderate management systems focused on spring early-preplant and POST applications only.

Figure 1. Dandelion populations over time (three years) with three management systems in a corn and soybean rotation.



Moderate management = glyphosate (0.75 lb ae/A) + 2,4-D ester[1] (1 pt/A) applied in the spring and glyphosate (0.75 lb ae/A) applied POST

Intensive management = glyphosate (0.75 lb ae/A) + 2,4-D ester[1] (1 pt/A) applied in the fall and spring and a herbicide with dandelion activity applied POST[2]

[1] Prior to planting soybean a minimum of 7 days is needed between 2,4-D ester (1 pt/A) applications and planting

[2] POST herbicide treatments were glyphosate (0.75 lb ae/A) in glyphosate-resistant corn and soybean; Callisto (3 oz/A) + atrazine (0.5 pt/A) in non-GMO corn; or Classic (0.75 oz/A) in non-GMO soybean

Tillage effects on dandelion management

Tillage can also be an effective strategy to manage dandelion. Tillage systems were designed to compare conventional tillage (fall chisel plow followed by spring field cultivation), rotational tillage (tillage only

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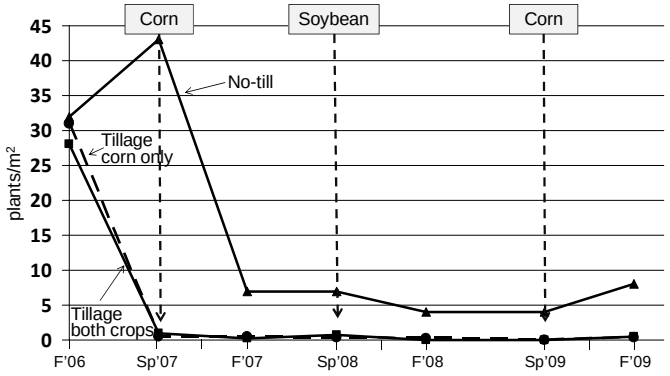
prior to planting corn in a corn-soybean rotation), and no-tillage. Tillage regardless if it was every year or every other year (rotational tillage) eliminated dandelion (Figure 2).

Figure 2. Dandelion populations over time (three years) comparing three tillage systems. Data are combined over herbicide treatments.

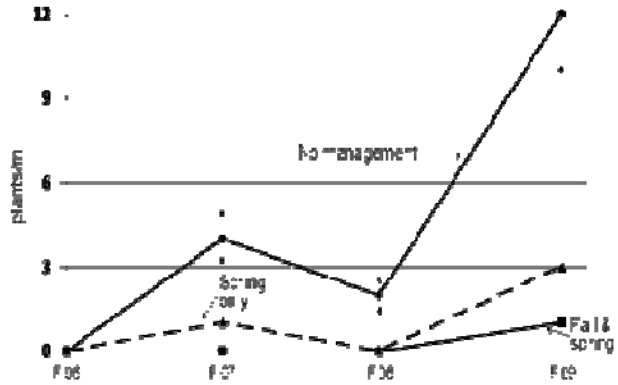


Crop planting sequence: corn - soybean - corn

Reestablishment of dandelion

Dandelion seed dispersal by wind is one of the more common ways dandelion reestablishes itself in new areas. In systems where dandelion management strategies were not employed or in systems where dandelion would only be managed in the spring dandelion has started to reestablish (Figure 3).

Figure 3. Dandelion reestablishment over time in areas where treatments were imposed with no dandelion activity, spring only herbicide treatments, and treatments applied in the fall and spring.



Spring only management = glyphosate (0.75 lb ae/A) + 2,4-D ester[1] (1 pt/A) applied in the spring

Fall and spring management = glyphosate (0.75 lb ae/A) + 2,4-D ester[1] (1 pt/A) applied in the fall and spring

[1] Prior to planting soybean a minimum of 7 days is needed between 2,4-D ester (1 pt/A) applications and planting

Recommendations for long-term dandelion management

- Dandelion can be effectively managed if the proper management systems are in place.
- Management systems that include fall herbicide applications with either spring or in-season POST herbicide treatments with dandelion activity are the Best Management Practices for dandelion.
- Systems that include tillage, even rotational tillage (every other year), can effectively manage dandelion.
- Dandelion control is important to maintain corn and soybean yields.
- Keeping effective management systems in place is important to stop the reestablishment of dandelion.
- Additional herbicides that have dandelion activity can be found in the *Controlling Dandelio*n fact sheet in *E-434 MSU Weed Control Guide of Field Crops*.

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