Weed Management Tips to Achieve Best Results

Weeds in the row can be a major source of competition in hops, especially in new plantings. Weeds compete for nutrients and moisture, and can interfere with crop management practices. As with most crops, as weed densities increase, hop yields decrease. Consequently, it is important to manage weeds in the hop row.

Most Midwest hopyards maintain permanent cover crops between the rows. The benefits of this practice include less erosion and soil compaction, better water infiltration, and a habitat to attract beneficial insects.

The width of the in-row weed-free strip depends on soil type, and grower preference. Generally, the strip should be wider on soils that have low moisture holding capacity. A width of 4 feet is probably adequate, but there is limited experience with hops on Michigan soils. Either mechanical or chemical means (or a combination of both methods) can be used to manage weeds in this strip.

Mechanical Controls

Mechanical cultivation is very effective at reducing weed populations. However, too frequent cultivation can destroy soil structure and may damage hop crowns. Avoid cultivating when soil is wet — heavier soils are particularly susceptible to compaction. Hand hoeing and pulling are effective but labor intensive.

Chemical Controls

There are a limited number of herbicides registered for use on hops in Michigan. Normally, growers will use both pre- and post-emergent herbicides to achieve the best results.

Herbicide application methods vary according to their activity. Applicators must apply pre-emergent herbicides very accurately to properly control weeds and avoid damaging the crop. An applicator must have a carefully calibrated sprayer capable of accurately maintaining pressure, flow rate, and ground speed. Applying pre-emergent herbicides with a backpack sprayer is not recommended because they cannot be applied precisely enough.

Post-emergence herbicides are easier to apply with hand-held equipment because they are applied as a dilution instead of a rate per acre. They can be applied at a volume necessary to cover the weeds without exact control over volume per acre. Backpack sprayers, wipers, and other hand-held equipment are suitable for post-emergence herbicides. Some products require crop oil concentrate or a surfactant added for best results, while others may already have an adjuvant added. Be sure to read the label to determine what type of adjuvant (if any) is needed.

Remember that there is always a potential that herbicides can unintentionally injure the crop. Some post-emergence herbicides should not contact any portion of the green hop plant or injury will occur. 2,4-D and glyphosate are examples of herbicides that must be used very carefully to avoid injury.

Applying Banded Applications of Herbicides

It is very important to understand the label recommendations and the difference between broadcast rate and banded rate. Herbicide labels typically give application rates as some unit of measure (pounds, quarts, etc.) per acre. However, when applying herbicides in a hopyard remember that only a narrow band along the row will be treated, so applicators must adjust the rate for the band width and the row spacing. An example of applying herbicides as a banded application follows.

An acre is 43,560 square feet. In this example, an acre of a hopyard has rows planted 14 feet apart. That would mean that it has 3,111 feet of row (43,560 ÷ 14). If an applicator applies a 4-foot wide band to each row, the total area treated in the acre of hops will be 12,444 square feet (3,111 x 4), or approximately 0.28 of the total acre. So if the herbicide label recommends a rate of 1 pound per acre and the applicator applies that full pound banded to the rows in the 1-acre hopyard, that herbicide is actually applied at 3.5 times the labeled rate, enough to severely damage the hop plants.

In the example given, 0.28 pounds of the herbicide should be applied in the appropriate volume of water to treat just the band area. Herbicide labels usually recommend application volumes of 10-40 gallons of water per acre (30 gallons per acre is a common volume). Remember, that is the broadcast volume. In the example given, the sprayer would be calibrated to apply 30 gallons per acre, and the tank filled with 8.4 gallons of water (30 x 0.28). The 0.28 pounds of product would be added and mixed with the water, and applied carefully to the band beneath the hop plants. That would apply the herbicide at the correct rate of 1 pound per acre in 30 gallons of water per acre to the band beneath the rows in the hopyard example provided.

Fig. 1 Example for determining banded rates for herbicide application

1) Divide acre in sq. ft. by row spacing in ft. to get feet of row per acre 43,560/14= 3,111 ft.
2) Multiply the feet of row by the band width to get the area to be treated. 3,111 ft x 4 ft = 12,444 sq. ft.
3) Divide the treated area by 43,560 to get the percentage of treated acre. 12,444/43,560= approx. 0.28
4) Multiply the herbicide broadcast rate by the percentage of an acre determined in 3) 1 pound x .28= 0.28 pound
5) Multiply the recommended volume of water for an acre by the percentage of an acre from 3) 30 gallons x .28 = 8.4 gallons