

## CASE STUDY 4: INTEGRATED PEST MANAGEMENT FOR WEED CONTROL

A demonstration at the Glacier Farm Media (GFM) Discovery Farm at Langham, Saskatchewan, Canada, explored the use of multiple strategies to manage Kochia (*Kochia scoparia* (L.) Schrad.). Kochia is a problematic weed in much of western United States and Canada with growing herbicide resistance. It tolerates salinity well and as a result takes advantage of poor crop competition in salt affected soils. The project at the GFM Discovery Farm highlighted the use of SWAT CAM to map weed leaf area, kochia leaf area, and crop leaf area (Figure 1). Once collected, these data layers were used to apply different rates of herbicides to specific areas in the field with varying weed density, reducing total pesticide load, reducing cost, and minimizing crop injury potential. In spring of 2021, sulfentrazone was applied prior to sowing spring wheat only in the areas with expected high kochia

density, based on the previous season SWAT CAM map (Figure 2). This simple on/off prescription reduced the applied amount by 54%.

The second cultural strategy to control kochia included higher seeding rates to improve crop competition. SWAT zones 7 to 10 in this field have high exchangeable sodium and moderate to high salinity, so wheat seed rates were increased as much as 30% in zone 10 to account for increased mortality in these soils (seeding prescription shown in Figure 3). This is just one example of how using multiple layers of spatial data can not only reduce pesticide use but also improve ROI and provide long-term management of a problematic weed species.

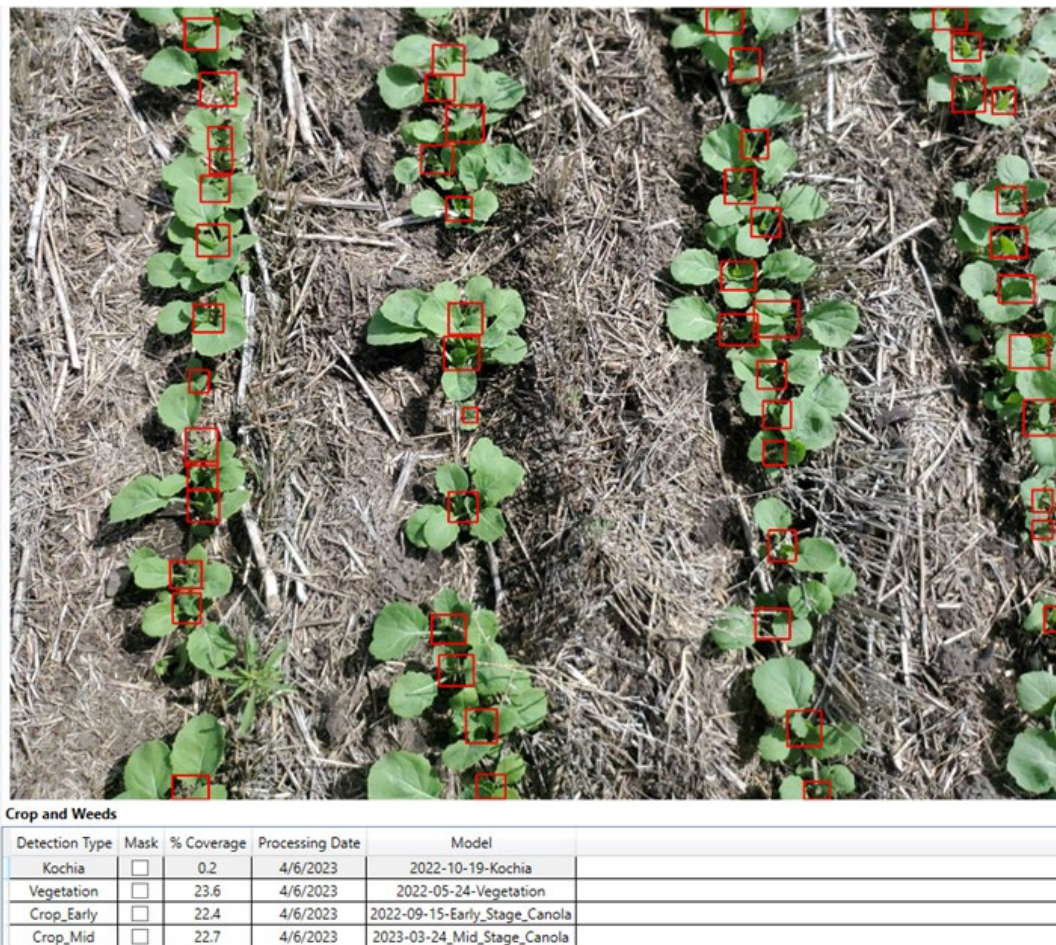


Figure 1. Example of SWAT CAM image used to map weed leaf area, kochia leaf area, and crop leaf area.

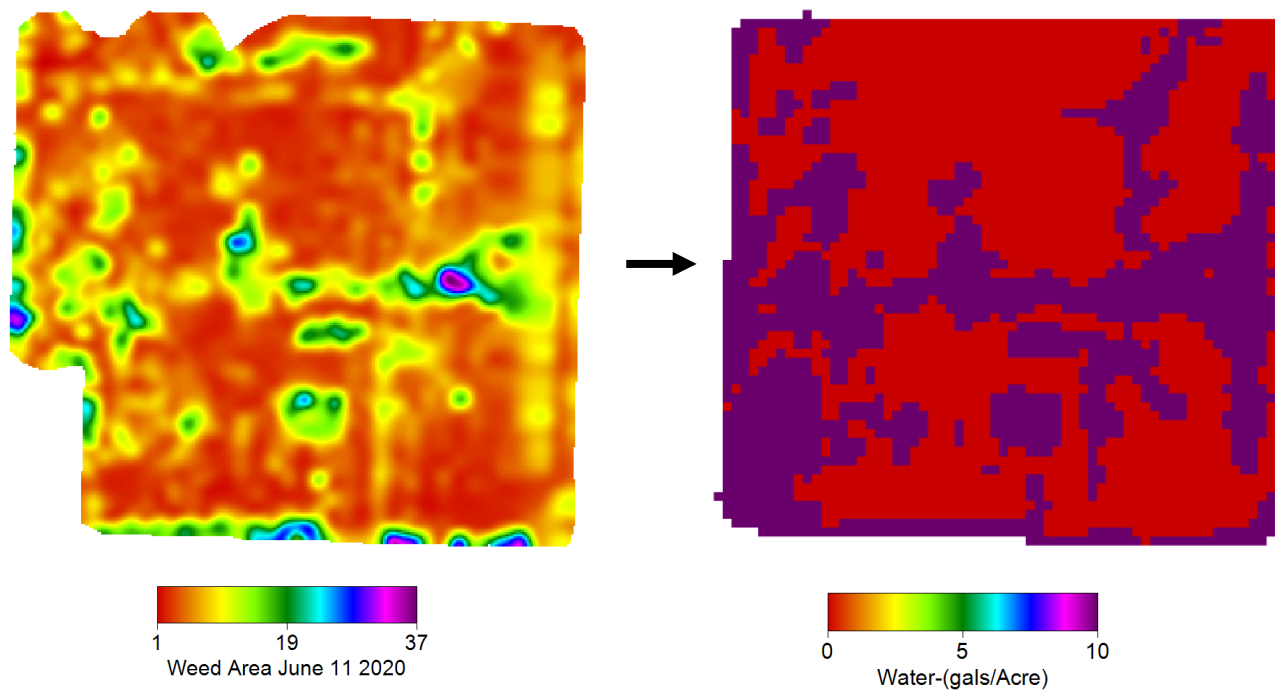


Figure 2. SWAT CAM map of weed leaf area (left) and the sulfentrazone herbicide prescription derived from it (right).

### APPLICATION SUMMARY

Zone	Area Acres	Yield Goal bu/ac	Layer 1 Wheat	Layer 2 MAP SR	Layer 3 NPKS	Layer 4 MAP SB	Layer 5	Applied Actuals
1	3.6	55	125	25	250	40		77-53-12-12
2	6.8	65	120	25	270	40		82-55-13-13
3	8.6	75	115	25	290	40		88-56-14-14
4	10.3	85	115	30	300	45		92-62-14-14
5	10.9	80	120	30	290	45		89-62-14-14
6	10.8	75	125	25	250	35		76-51-12-12
7	10.4	65	130	20	200	30		61-42-10-10
8	4.7	55	135	15	150	30		47-35-7-7
9	2.8	40	145	10	100	20		31-23-5-5
10	1.2	25	150	10	70	10		22-16-3-3
	70.1	70.2	123.7	24.2	247.2	37.3		76-51-12-12

Figure 3. 2021 prescription for sowing wheat (Layer 1, lbs/ac of seed) with seed row P (Layer 2) and additional NPKS in sideband (layers 3,4).