

Seeding and Mowing Dates for Hairy Vetch and Rye

Francis X. Mangan and Stephen J. Herbert

Department of Plant and Soil Sciences

University of Massachusetts

An important question concerning these two cover crop species is the optimum time of planting in the fall and mowing in the spring. Early seeding in the fall is essential to achieve sufficient biomass growth prior to winter freezing in order to provide an effective cover for control of soil erosion. When cover crops are to be left as a surface mulch for weed suppression it is also important to estimate the optimum cutting time the following spring. This is to ensure that the cover crops will not regrow and compete with no-till planted cultivated crops.

Five different times of planting of the hairy vetch (*Vicia villosa*) and winter rye (*Secale cereale*) mixture were established and compared to an unplanted check in a replicated experiment in the summer and fall of 1989. Biomass samples were collected in late fall to determine plant growth. Figure 1 reports above-ground biomass yield of hairy vetch and rye. For the July 1 planting, rye growth was suppressed by competition from the hairy vetch.

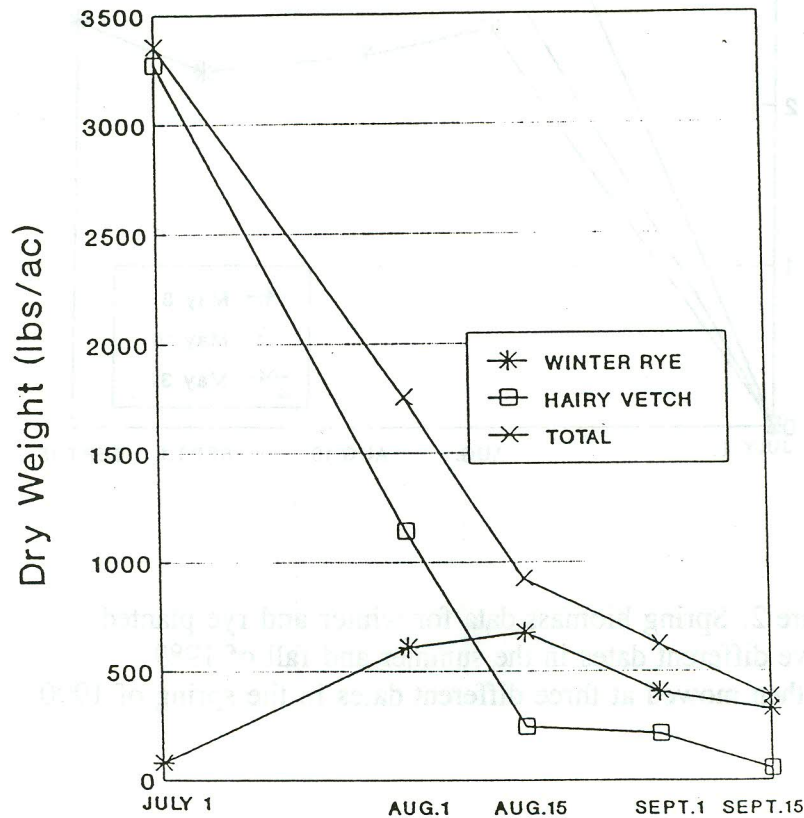


Figure 1. Fall biomass data for winter rye and hairy vetch planted at five different dates in 1989.

The three mowing dates were May 3, May 16 and May 31. Above-ground biomass samples were taken before each mowing date to determine the spring plant growth of the two cover crop species. Figure 2 reports the total biomass accumulation for the hairy vetch and rye at the three mowing dates. Both the rye and vetch winterkilled for the July 1 planting. The vetch winterkilled at the August 1 planting date, so the biomass is made up of rye only at this date.

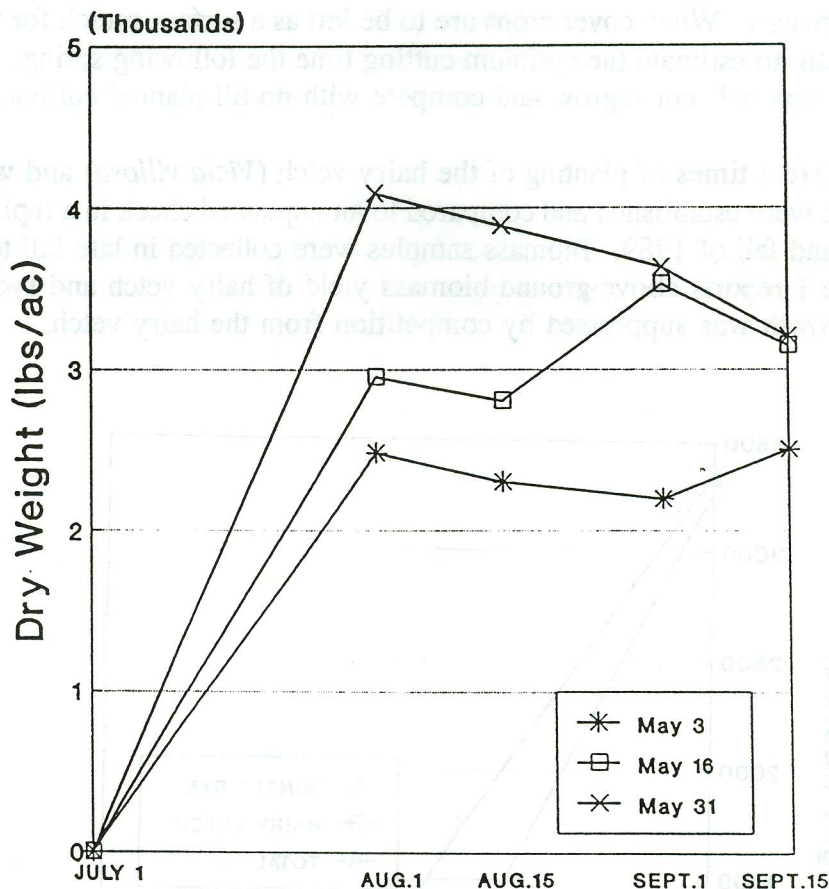


Figure 2. Spring biomass data for winter and rye planted at five different dates in the summer and fall of 1989 and then mowed at three different dates in the spring of 1990.

Soil samples were taken May 9, six days after the first cutting, to compare the soil moisture content among the six treatments (Table 1). There was no statistical difference in the percent soil moisture among treatments.

Table 1. Soil moisture content for five planting dates and a control. Samples were taken May 9 from plots that were mowed May 3.

<u>Treatment</u>	<u>% Soil Moisture*</u>
Bare Ground	16.2
July 1	17.7
August 1	16.3
August 15	16.6
September 1	16.8
September 15	16.8

*not significant at the 0.05 level

The number of rye and vetch plants that regrew after being mowed was determined on July 20, 1990. Figures 3 and 4 report the number of live rye tillers and vetch plants per square foot. Figures 5 and 6 report the height for the two cover crop species.

The rye proved to be more persistent than the vetch (Figures 3 and 4). The third cutting (May 31) had the smallest regrowth for both the rye and vetch. There was no vetch regrowth at the last cutting for the August 15 and September 1 plantings. The time of mowing had a much more significant effect on the height of the cover crops than the population (Figures 5 and 6).

The percent weed cover was taken July 10 for the five planting dates and the control (Figure 7). Among the cover crop planting dates, the July 1 planting had the highest weed pressure. This was due to the fact that the cover crops had winterkilled. For the August 15, September 1 and 15 planting dates, no weeds were present for the first cutting due to the tremendous regrowth of the cover crops which was able to out-compete weed species.

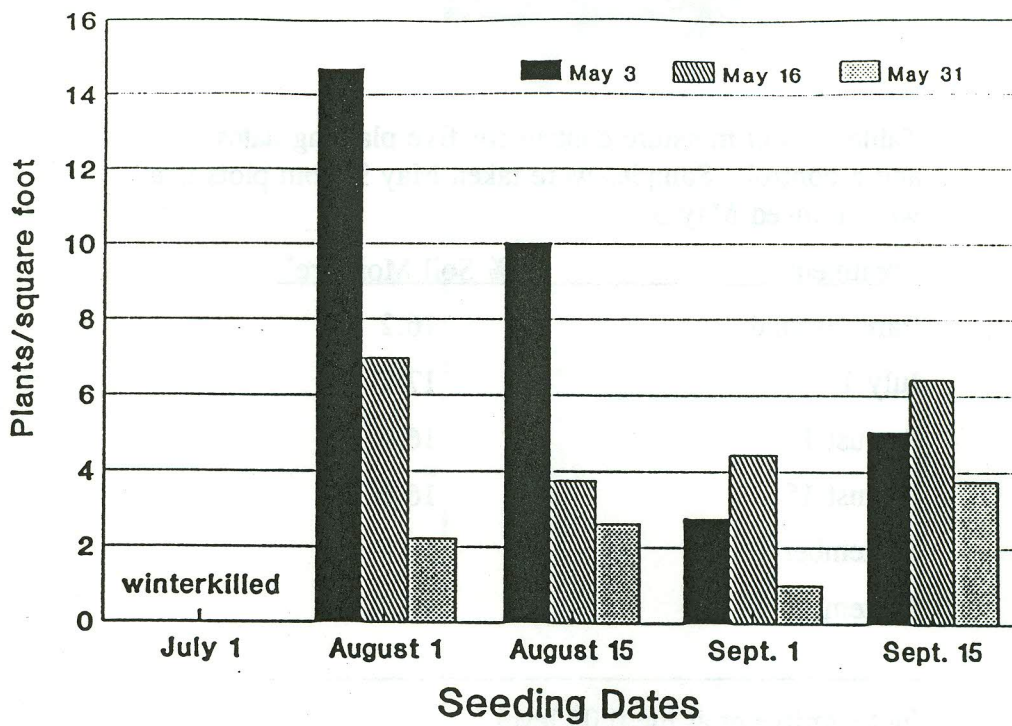


Figure 3. Number of live tillers per square foot of winter rye for winter rye and vetch planted at five different dates in 1989 and mowed at three different dates in the spring of 1990.

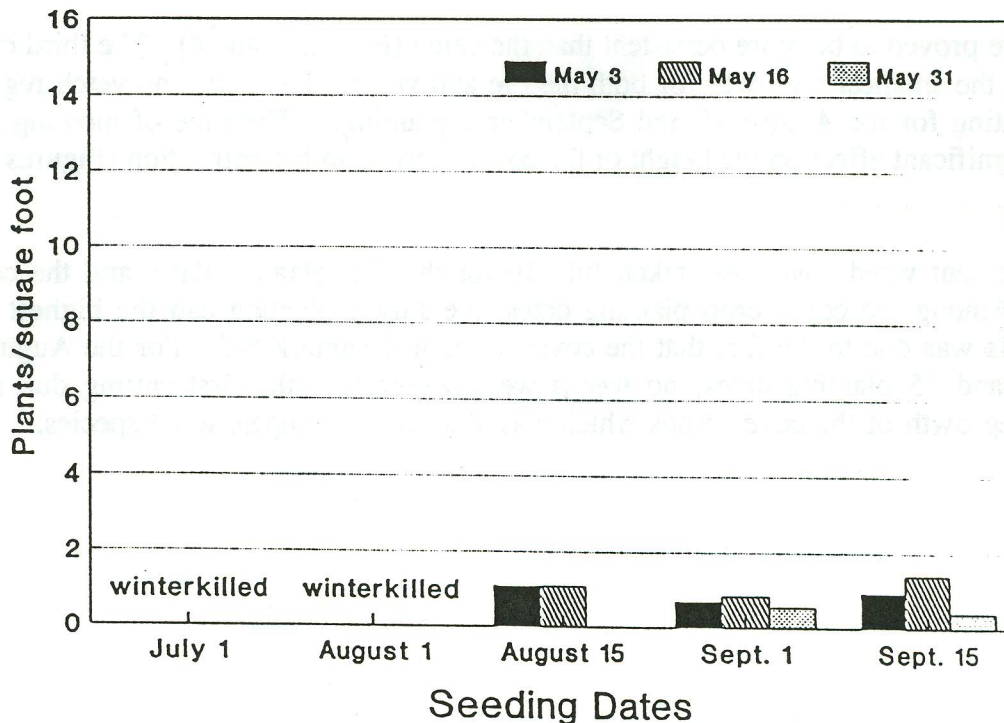


Figure 4. Number of live plants per square foot of hairy vetch for winter rye and vetch planted at five different dates in 1989 and mowed at three different dates in the spring of 1990.

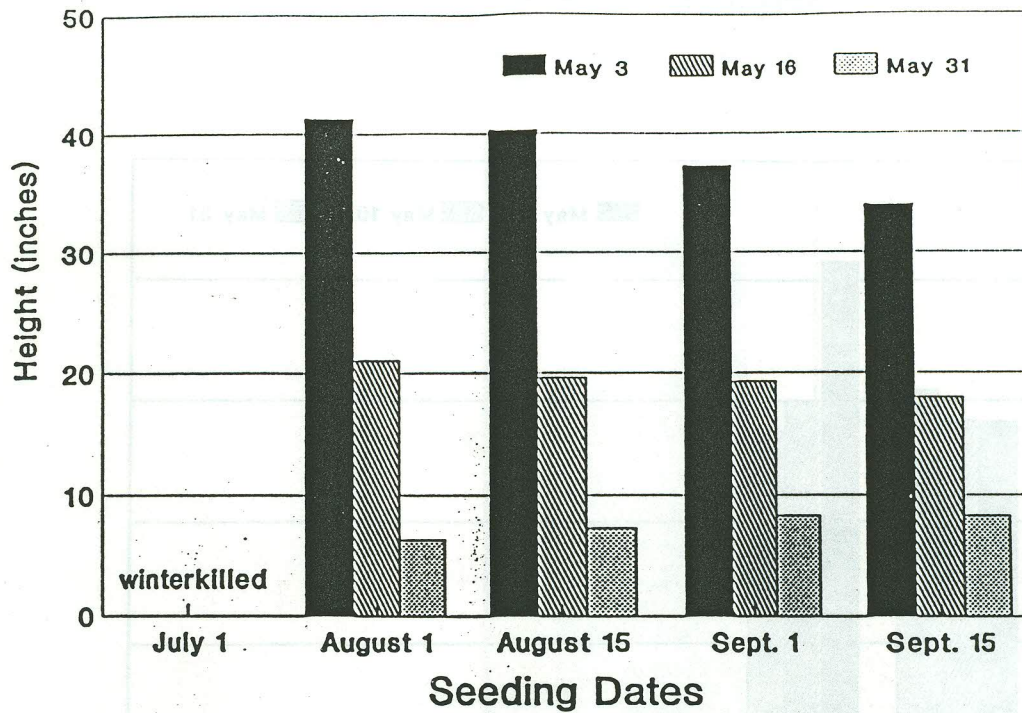


Figure 5. Height of live tillers per square foot of winter rye for winter rye and vetch planted at five different dates in 1989 and mowed at three different dates in the spring of 1990.

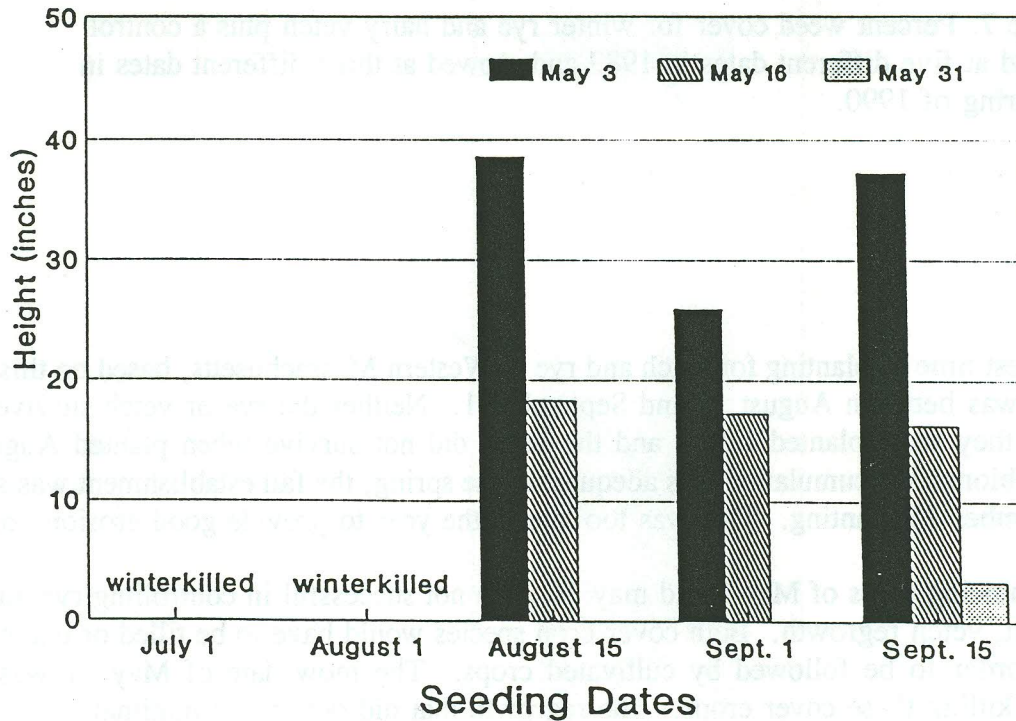


Figure 6. Height of live plants per square foot of hairy vetch for winter rye and vetch planted at five different dates in 1989 and mowed at three different dates in the spring of 1990.

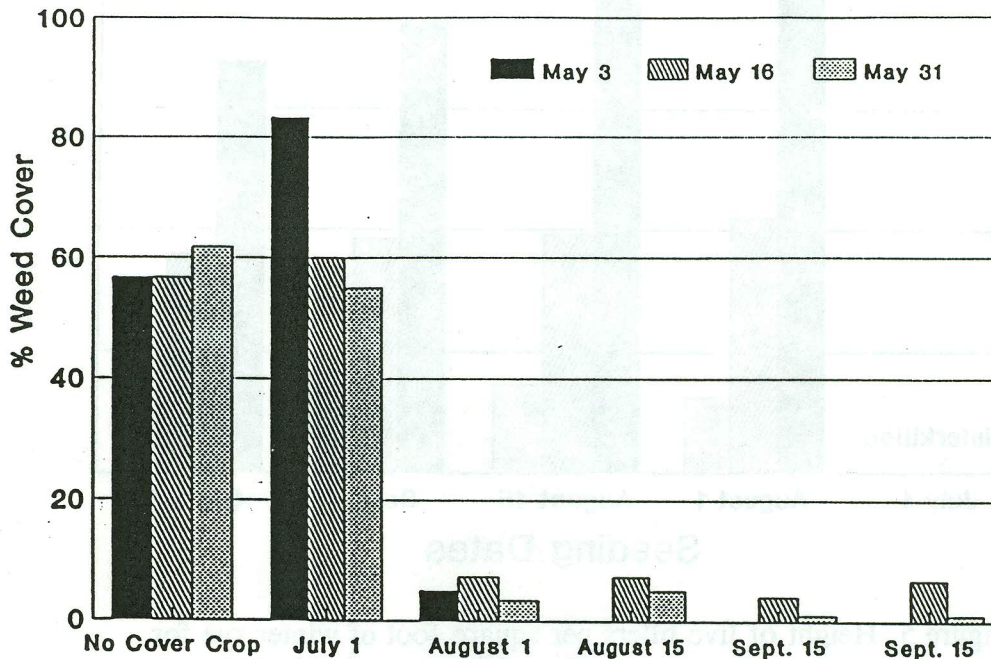


Figure 7. Percent weed cover for winter rye and hairy vetch plus a control planted at five different dates in 1989 and mowed at three different dates in the spring of 1990.

Conclusions

The best time of planting for vetch and rye in Western Massachusetts, based on this data, in this year, was between August 15 and September 1. Neither the rye or vetch survived the winter when they were planted July 1 and the vetch did not survive when planted August 1. Although the biomass accumulation was adequate in the spring, the fall establishment was sparse for the September 15 planting. This was too late in the year to provide good erosion control.

The mowing dates of May 3 and May 16 were not successful in controlling rye and, to a lesser extent, vetch regrowth. Both cover crop species would have to be tilled or chemically managed in order to be followed by cultivated crops. The mow date of May 31 was very successful in killing these cover crops. The regrowth that did occur was minimal.

A PTO-driven flail mower was used to mow this experiment. It did a thorough job of mulching the cover crops. However, the mulch that was left on top of the soil was much thinner than when a cycle-bar mower was used in other experiments. The thicker mulch appeared to aid in inhibiting the rye regrowth.