Website address:
https://www.biooekonomie-bw.de/en/articles/pm/der-mulchzeitpunkt-von-waldwiesen-beeinflusst-die-insektenvielfalt

Mulching time of forest meadows influences insect diversity

Researchers at the University of Freiburg have examined how mulching at different times affects insect flower-visitors and larvae.

Mulching is a possible management method for forest meadows and is important to their upkeep. During the process, the meadow is cut and the cuttings are shredded and left on the meadow. Despite its significance, the effects of this method on insects living in this habitat has rarely been studied up to now. Dr. Maria M. Georgi of the team working with the head of the University of Freiburg's Chair of Nature Conservation and Landscape Ecology – Prof. Dr. Alexandra-Maria Klein, and her colleagues studied this in-depth. The result: Nearly all the mulching times examined had a negative impact on insect larvae and flower-visiting insects which are found on forest meadows. Georgi says, "Management is important for the maintenance of forest meadows. That is why we're proposing alternative types of mulching be applied in future to improve conservation of the insects living there if no opportunity to apply another method, such as cut, is available."

Meadows are important to the forest; mulching is important to the meadows

Forest meadows are often managed to attract game animals. This reduces their browsing of young plants – so the grazing of leaves and twigs – in the surrounding woods. Management is required to retain forest meadows. Otherwise, the forest would spread increasingly and the meadow would disappear. Compared to other methods, mulching is more effective in terms of cost and labor intensity. During the processes the meadow is mowed and the cuttings are shredded and left on the meadow. Although the impact of cut on plant and insect diversity has been intensively investigated, the opposite had been the case for mulching up to now.

Examining of four mulching times

The study was carried out at 24 locations in the northern Black Forest. The focus was on insect larvae and insect flower-visitors. The researchers examined how different mulching times affected these insects. Six locations were designated for a control group. They were not mulched. These were compared with six meadows that were mulched either in June or September, as well as six additional meadows that were mulched both in June and September. In terms of insect larvae, sawflies (*Symphyta*) accounted for 45 percent of the population studied, with butterflies (*Lepidoptera*) making up 44 percent. Hover files (*Syrphidae)* dominated the flower-visiting insects. They made up a share of 80 percent.

September mulching protects flower-visiting insects

For the insect larvae, all three mulching times studied had a negative impact on numbers compared to the control group. The findings were similar for the flower-visiting insects. Here, mulching in June, as well as mulching in June and September, had a negative impact on the number of insects counted. Yet September mulching had no impact in the case of flower-visitors. Georgi concludes, "On the basis of our results, we can recommend mulching in September in order to protect flower-visitors."

Impacts on insect conservation

In a study published in November 2022, the researchers also investigated the impacts of mulching times on the nests of solitary bees and wasps that lived in cavities above ground. Mulching in June alone is best for their protection. Taken together, the results of both studies indicate no general recommendation can be made about mulching times. Conserving forest meadows is significant for the preservation of biological diversity and management of the surrounding forest. So meadow management is important, too. "Management with the aim of maintaining biological diversity should find a balance between plant and insect diversity," says Georgi. "Insect-friendly mulching machines or using alternative times could be better ways to unite both objectives."

Press release

01-Mar-2023
Source: Albert-Ludwigs-University Freiburg

Further information

- University of Freiburg