Nesting aid for wild bees

Goal	Improvement of the supply of nesting sites for wild bees
Target group	All farms of any production type can apply this measure.
Description of the measure	Material and setup A wild bee nesting aid supports species which lay their eggs in holes. The more diverse it is structured, the higher the chance that different species of bees establish. Many bees use already existing horizontal small channels as breeding cell. For the support of those species materials such as wood, reed or twigs of elder- and/or blackberry can be used. Nesting aid made of wood Unvarnished, deposed massive wood log of oak, any fruit tree or ash (12 cm width, 12 cm depth, 20 cm height): drill cross the texture of age rings to avoid cracks in the wood and moisture in the brood borrow. Borehole diameter: 2–10 mm (recommended distribution: 5 % each: 2, 9, 10mm holes, 10 % each: 3mm holes, 15 %: 4, 5, 6, 7, 8mm holes). Distribution of boreholes should by asymmetric. Use a sharp drill which does not overheat. Borehole depth: 100 mm but do not drill through the log. Borehole density: distance to the next hole should be around 1,5 times the size of the bore-hole diameter, on the margin a little more. Splinter on the hole entrance should be removed with sandpaper or drill. The backside of the log should be oiled and impregnated. On the top of the nesting aid a roof should be attached (impregnated wooden plank, aluminum or plastic), which overtops the front and sides of the log. Nesting aid with reed Cut reed with an inner diameter of 3–9 mm on 10–20 cm long parts and tie them together. Close one side with cotton wool or put them horizontal into hollow bricks/cans. Wild bees require closed and dark small tubes. It may take a few month up to two years until wild bees colonize nesting aids. There are numerous other construction options for nesting aids, considering size and material. Practical guides can be found, e.g. at www.foxleas.com/make-a-bee-hotel.asp Maintenance Wild bees clean their breeding borrows mostly by themselves. The front side of the nesting aid should be mown regularly in order to keep the pathways open.

Suitable sites	Sunny sites on the farmstead close to flowering areas, biotopes and margins <u>Orientation</u> Wild bees like it warm and dry. Therefore, in colder climates, like the temperate region, a sunny, wind- and rain protected site (south/south east, not facing the weather) should be chosen. However in warmer climates like the Mediterranean regions avoiding these orientations is crucial for avoiding very high temperatures that could kill the insects. In very warm areas they shall be protected from direct sun (under tree canopy, beside walls, inside hedgerows, etc.). Furthermore, in warm climates nesting aids may not be coloured black in order to avoid overheating as well.
How a good implementation looks like	▪ Appropriate orientation according to the local climate ▪ Installed protected from wind and rain ▪ Not overgrown with vegetation ▪ High quality, such as "clean" holes, holes along the texture of the wood and others as described above
Effects on biodiversity (ecosystems, species, soil biodiversity)	 The decrease of pollinating **insects** is one of the main threats for the biological diversity. More than 80 % of our native wild herbs are not able to ripen seeds without pollinators and are thus endangered themselves. Main reason is the decrease of habitat and forage supply for wild bees. The supply of nesting aids in combination with diverse pollen- and nectar sources is a valuable tool to support wild bees.  Meanwhile, insectivorous **birds** get supported, too.
Other positive effects/benefit for the farmer	As some wild bees are already active between 4 and 10°C, they can contribute to pollination at weather conditions which are unsuitable for the honey bee. Therefore, the provision of nesting aids is a valuable measure to increase the yields. Studies showed furthermore, that wild bees are more effective than honey bees: With the same amount on flower visits compared between wild pollinating insects and honey bees, double the amount of fruits were built by plants pollinated by wild insects.
Indicator/key data	▪ Number of nesting aids which are in use
Risk and further recommendations	Bee nesting aids may attract woodpeckers, tits and parasites which may easy prey food there. Chicken wire, which is attached around the nesting aid protects from bird muck. To decrease pressure from parasites, new nesting aids can be arranged every one to two years. Artificial nesting aids may only partly compensate deficits of the intense-used cultural landscape. Vital is therefore a divers and natural supply of nesting sites for ground nesting insects as well as aboveground nesting bee species. Overall, it is important to preserve small diverse structures in the landscape which can be used for wild bees.

	This measure supports wild bees in specific. Many other beneficial insects, however, require similar nesting sites but may need different hole sizes. To support a diversity of insects, a combination of different nesting aids are recommended.
Timeframe (When to start a measure and anticipated time for implementation)	When to start: Construction in winter or early spring in order to give bees time to settle before breeding time.
Additional special resources/ equipment/ skills needed	Construction material can be bought at every building supplies store. Costs depend on the size of the nesting aid. It is also possible to buy prepared nesting aids. Often, however, these are insufficiently set up: ▪ they offer insufficient protection from wet weather ▪ the holes are too large, because they are made abroad to cater for species that do not live in Europe ▪ tubes have splinters inside ▪ tubes have no solid back wall and are simply open-ended wind tunnels ▪ they contain glass or plastic tubes which cause condensation and fungus moulds On the other hand, one safes a lot of time. Therefore, please consider all the points mentioned above before buying a prepared nesting aid.
References	▪ www.foxleas.com/make-a-bee-hotel.asp ▪ www.landwirtschaft-artenvielfalt.de/ ▪ www.nabu.de/tiere-und-pflanzen/insekten-und-spinnen/insekten-helfen/00959.html ▪ Promotion of biodiversity in fruit plantations – NABU; REWE and Lake Constance Foundation, 2015

Further information: Knowledge Pool

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