7.5 Livestock farming and pasture
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Based on the collated evidence, what is the current assessment of the effectiveness of interventions on livestock and pasture farming systems for enhancing natural pest regulation?

<table>
<thead>
<tr>
<th>Likely to be beneficial</th>
<th>• Grow plants that compete with damaging weeds</th>
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<tbody>
<tr>
<td>Unknown effectiveness (limited evidence)</td>
<td>• Delay mowing or first grazing date on pasture or grassland</td>
</tr>
<tr>
<td>Likely to be ineffective or harmful</td>
<td>• Use grazing instead of cutting for pasture or grassland management</td>
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<td></td>
<td>• Use mixed pasture</td>
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</table>

**Likely to be beneficial**

- **Grow plants that compete with damaging weeds**
  
  - *Weed weight and cover*: Nine studies from Australia, Slovakia, the UK and the USA tested the effects of planting species to compete with weeds. All (including four replicated, randomized, controlled trials) found reduced weed plant weight or ground cover, although two found this only in some years or conditions.
  
  - *Weed reproduction and survival*: Five studies (including three replicated, randomized, controlled trials) also found that competition reduced weed reproduction, survival or both. One of these found an effect only in one year only.
Some Aspects of Enhancing Natural Pest Control

- **Crops studied**: clovers, fescues, ryegrass, other grasses and turnip.
- **Assessment**: likely to be beneficial (effectiveness 70%; certainty 60%; harms 5%).

http://www.conservationevidence.com/actions/722

### Unknown effectiveness (limited evidence)

#### Delay mowing or first grazing date on pasture or grassland

- **Natural enemy abundance**: One replicated, randomized, controlled study found fewer predatory spiders with delayed cutting. Three studies from the UK (two of them replicated, randomized and controlled) found no change in insect predator numbers and one replicated study from Sweden found mixed effects between different predator groups.

- **Natural enemy diversity**: One replicated study from Sweden found a decrease in ant diversity with delayed cutting and one replicated, randomized, controlled study from the UK found no effect on spider and beetle diversity.

- **Pests**: One of two replicated, randomized, controlled studies from the UK and USA found more pest insects in late-cut plots and one found no effect.

- **Insects in general**: Four replicated, randomized, controlled studies measured the abundance of insect groups without classifying them as pests or natural enemies. One UK study found lower numbers in late-cut plots, while two found effects varied between groups. Two studies from the UK and USA found no effect on insect numbers.

- **Crops studied**: barley, bird’s-foot trefoil, clovers, fescues, rapeseed, ryegrass, other grasses and wheat.

- **Assessment**: unknown effectiveness (effectiveness 5%; certainty 20%; harms 15%).

http://www.conservationevidence.com/actions/727
Likely to be ineffective or harmful

Use grazing instead of cutting for pasture or grassland management

- **Natural enemies:** Two studies (one before-and-after and one replicated trial) from Australia and the UK found grazing instead of cutting had mixed effects on natural enemies, with some species and groups affected on some dates but not others. One replicated study from New Zealand found no effect.

- **Pests and diseases:** One of five studies (including three replicated trials) from Australia, New Zealand, the UK and the USA found more pests, and two studies found effects varied between pest groups and sampling dates. Two studies found no effect on pests. One study found no effect on disease when grazing was used in addition to cutting.

- **Pasture damage and plant survival:** One randomized study found more ryegrass shoots were attacked by pests. One study found lower survival of alfalfa plants but another found no effect.

- **Yield:** One of four randomized, replicated studies (one also controlled) found lower yields and two found no effect. One study found lower ryegrass and higher clover yields, but no difference between clover varieties. Another randomized study found more ryegrass shoots.

- **Crops studied:** alfalfa, cock’s-foot, perennial ryegrass, other grasses and white clover.

- **Assessment:** likely to be ineffective or harmful (effectiveness 10%; certainty 45%; harms 40%).

http://www.conservationevidence.com/actions/885

Use mixed pasture

- **Weeds:** Two of two studies (randomized and replicated and one also controlled) from the USA found weeds were negatively affected by mixed compared to monoculture pasture.
• **Pests:** Five studies from North America measured pests including four randomized, replicated, controlled tests. One study found fewer pests and two studies found negative or mixed effects depending on different pests groups or pasture mixes. One study found no effect and another found more pests, although the effect was potentially inseparable from grazing treatments.

• **Crop mortality:** One randomized, replicated study from the USA found no effect on forage crop mortality caused by nematodes.

• **Yield:** Two of five studies (including two randomized, replicated, controlled tests) from North America found increased forage crop yields and two studies found mixed effects depending on the crop type and year. One study found no effect.

• **Crops studied:** alfalfa, bird’s-foot trefoil, chicory, cicer milkvetch, clovers, fescues, oats, plantain, ryegrass, other grasses, other legumes, rapeseed and turnip.

• **Assessment:** likely to be ineffective or harmful (effectiveness 35%; certainty 45%; harms 20%).

   http://www.conservationevidence.com/actions/721