

OSU Horticulture Workspace

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Tags: Cereal
Legume
Administrator

Research Interests:

- ❖ Small grain production
- ❖ Legume intercropping for soil nitrogen and soil and water quality improvement.

Intercropping with Legumes in the Low Precipitation Areas of the Pacific Northwest

The benefits of having a legume in rotation with small grains has been demonstrated through increased small grains yields, improved plant health, reduced nitrogen applications and improved soil quality. The system offers significant potential for benefits on over 1 million acres of small grains in the Columbia Basin.

While legumes in rotation or as cover or green manure crops with small grains promise benefits, the system also has challenges. In those areas of the PNW that receive 14" or more annual rainfall or that receive later spring rains, the use of legumes with small grains has been very successful. This has not been the case in the lower precipitation dryland summer fallow small grains production areas in the PNW. The challenges include: low precipitation which comes predominately in the winter and early spring months; frequent dry falls which delay seeding into late October or November; frequent dry, hot springs that reduce growth; moisture loss for the following small grains crops when grown in rotation with cover or green manure crops; cost of inputs for a cover or green manure crop; low market value of legume rotation crops, and very few adapted legume crops suitable for this precipitation zone. Growers have been very interested in legume cover/green manure/rotation crops but have not found the system successful.

There has been significant work in the summer rainfall areas of the US and Canada in intercropping legumes with small grains. The legume may be harvested with the grain or used as forage following the grain harvest.

In Oregon, our preliminary design in the low precipitation (10"-14") dryland summer fallow production areas of the Columbia Basin plants winter peas with winter wheat. This system has shown that intercropping is feasible and may boost wheat yields by 4% to 45% with limited inputs (45 kg N ha⁻¹) and no in-crop weed control. The pea occupied the inter-row space and in the process smothered weeds.

We are screening various legume crops for suitability in intercropping with grain. These include low, medium and tall winter peas, various varieties of hairy vetch, various clovers, lentils, medic and fenugreek. To date, peas have been the most successful though we anticipate that newer varieties of hairy vetch may be suitable for intercropping. Vetch is well adapted to the low precipitation regions of the PNW. The newer varieties flower earlier in the season, enhancing nodulation and nitrogen fixation over other crops tried to date.

Other intercrop work compares half and full rates of winter peas with a full rate of winter wheat and varying rates of nitrogen/acre to determine nitrogen value for the wheat crop. We are also exploring the use of hairy vetch as a short-term cover crop prior to fall seeding of winter wheat and with spring wheat to see if we can gain benefits of a late summer cover crop.

Project member:

- [Evaluating Meadowfoam as a Pesticide in Dryland Organic Wheat Production](#)

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