Using Genetic Modification to Enhance Wheat Productivity

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**Flowering**
- Investigating genes involved in pollen production for the development of hybrids
- Rates of recombination and increasing breeding potential
- Increase length of growing period

**Seed development**
- Examine transcription factors in wheat grain development
- Improve kernel size, yield and feed quality

**Seed Quality**
- Reducing pre-harvest sprouting
- Manipulating starch storage in the grain

**Disease**
- Defence responses to fungi and insects
- Resistance to microbes including powdery mildew and septoria (leaf blotch)
- Study fungal infection processes
- Transfer avenacin from oats to wheat to inhibit Take-all fungus

**Stress**
- Increasing drought and stress tolerance
- Reducing light-induced leaf damage
- Improving abiotic stress tolerance and grain yield
- Fine tune photosynthesis and water use in response to environmental conditions.
- Turbocharge photosynthesis

**Leaf traits**
- How light and gibberellins affect wheat harvest index
- Increase digestibility of leaf and stem (TALEN gene editing)
- Improve leaf and stem hydraulic conductivity

**Root interactions**
- Monitor interactions of roots with blackgrass
- Measuring how roots perceive rhizobia
- Improve P uptake
- Optimise N uptake and remobilisation

**Root traits**
- Improving tolerance to manganese
- Increasing root hair number/length
- Improving silicon uptake and stress tolerance