Pre-Breeding and Development of Sainfoin (*Onobrychis viciifolia*)

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INTRODUCTION

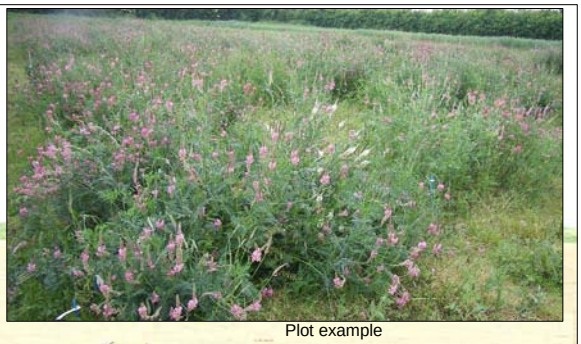
This project forms part of an EU funded project entitled "Healthy Hay"; the re-invention of sainfoin: an example of a novel resource for sustainable agriculture. A new sainfoin breeding programme has been initiated. NIAB has established an extensive collection of sainfoin germplasm comprised of 304 accessions. These have been collected from many national and international collections and from the wild. We are evaluating the agronomic and morphological characters of this germplasm collection and the genetic diversity represented.

Example of seed variability

FIELD

The plants are reared in the greenhouse and then transferred to the field:

- Well-drained, alkaline to neutral soil is required by this crop
- Each accession is represented by three replicates of 1.5m^2 plots with 36 plants
- Currently, 173 accessions have been planted in the field
- Area is nearly 0.5 hectares



Plot example

MORPHOLOGICAL EVALUATION

Traits are being monitored for each plot:

- Vigour
- Habit (prostrate or erect)
- Pathology
- Homogeneity
- Flower colour
- Growth rate
- Flowering date
- Leaf colour and shape

SEED PRODUCTION; 75 accessions selected

- Bumblebees used to pollinate lines

bumblebee mini hive

insect-proof tunnel

- Isolation of different lines is necessary to ensure good pollination and seed purity
- Average of 3500 seeds produced per plot

Diseases and pest observed

Plant infected by *Fusarium sp.*

Leaf spot caused by *Stemphylium sp.*

Plant infected by *Erysiphe sp.*

Leaves eaten by *Sitona* weevil

Inter-line and Intra-line differences

Differences in inflorescence colour from white to purple

Differences in leaf colour and shape

Erect plant green stems vs prostrate plant red stems

FUTURE work underway...

- Determination of ploidy level
- Characterisation of the phylogeny of the accessions using AFLP and microsatellites markers
- Evaluation of the viability of the produced seeds

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