



Kew Science – The Herbarium

Using the Herbarium Collections to Produce Seed Collecting Guides

In the herbarium we have over seven million specimens collected from all over the world. The herbarium was established in the Victorian era. This older part of the herbarium was designed to maximise the light coming in. We have visitors from all over the world who come to study the specimens here. This is a seed collecting guide which we produce as a tool for the seed collectors, which has species profiles inside for all of our target species. A lot of the information that goes into the guide actually comes from the herbarium specimens so as an example on one of these pages we have maps here showing where that this plant is located, and a lot of that information comes from the localities which are recorded on the herbarium specimens when those specimens were collected. So, we can look at a herbarium specimen and the date that that specimen was collected, and we can combine that information with looking at the plant itself to see if when that plant was collected if it had flowers or fruit on it. And so that phenology information can be used in the guide so that we can say this plant was collected in May and it has fruits on it and we can look through all of the specimens and build up a phenology profile so that we can include that information in the guide in this little space here which tells us that this particular target species is in flower between April and July and has ripe fruit between April and July as well. So that our seed collectors know that when they go to collect that particular species they'll be able to go at the right time of year when the plant will have ripe fruit and good quality seeds.

For this particular species profile, the images that we used here were taken from the herbarium specimen. The collecting guide is designed to be used in the field so each species profile is held in the ring binder as a separate sheet. The separate sheets are all encapsulated so that they're water proof and dust proof and dirt proof. And they're also quite robust so that they won't get damaged when they're used in the field.

When the plants come back to Kew, when it's been collected from an expedition, they're pressed and mounted on sheets of paper. And alongside the plant is a label which contains all the really useful information about where that plant was collected.

So this is the wild relative of the pea and we can see looking at these two specimens side by side that they look very different. So the wild relative is a much smaller plant and we can see all of the features on here are much smaller and it's a much smaller plant with smaller leaves and the flowers and the pods themselves are much smaller compared to this cultivated plant.

The label has really useful information containing the locality of the plant and it often has habitat information as well. And it will tell us information about the conditions where the plant was collected and it may have a description about what the fresh material looked like as well. Things like



the date that it was collected is very useful information for us because we can look at this date and see it was collected in August and we can see from the specimen itself that it's got flowers and fruit on there, so that gives us phenology information telling us that if we were to try and find this plant again at this locality it should have flowers and fruit if we were to go back at that same time of year. And then we could collect the seed. And those seeds could then be used for breeders who can characterise them and potentially screen them for useful traits which could potentially be used for breeding new crops which are resistant to climate change in the future.

With thanks to Ruth Harker, Dr. Ruth Eastwood, Dr. Jonas Mueller, Danielle Haddad, Jon Drori, Simon Laurie, Royal Botanic Gardens, Kew and The Global Crop Diversity Trust.