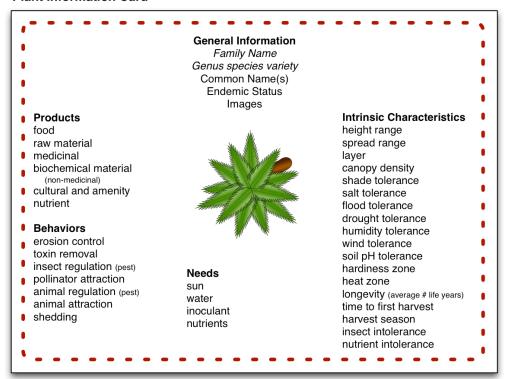
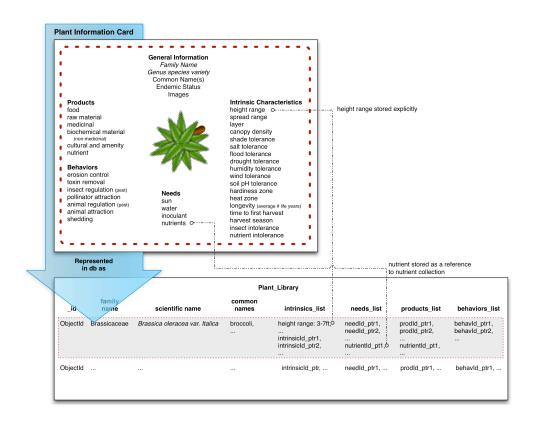
## **Database Schema Depiction (incomplete)**

The database will have the ability to show the following information about each plant.

#### **Plant Information Card**



Each plant is a document in the Plant\_Library collection. All information unique to that particular plant, (General Info: {scientific name, common names, images}, Intrinsic Chars {height range, spread range, longevity, time to first harvest}) will be explicitly stored in the document. All remaining information will stored as a mongo DBRef to the corresponding Library Entry.



#### Libraries:

There are a total of five Libraries: Intrinsics, Needs, Products, General, and Plant. Each of the first four libraries (Intrinsics, Needs, Products, General) is a collection of documents that store names and a MongoDB DBref to the collections that make up the content of the libraries (e.g. Intrinsics stores a DBref to the Layer collection). The library-content collections (e.g., Layer) contain documents that represent values for that property. Each document has a plant\_list property which stores all of the documents in Plant\_Library that reference that particular document. This is for easy reverse look-up (i.e., find all plants of the climax layer).

Intrinsics_Library			
_id	value	collection_ref	
ObjectId	Layer	collectionId_ptr	
ObjectId	Canopy Density	collectionId_ptr	
ObjectId	Harvest Season	collectionId_ptr	
ObjectId	Shade Tolerance	collectionId_ptr	
ObjectId	Salt Tolerance	collectionId_ptr ●	
ObjectId	Flood Tolerance	collectionId_ptr	
ObjectId	Drought Tolerance	collectionId_ptr	
ObjectId	Humidity Tolerance	collectionId_ptr	
ObjectId	Wind Tolerance	collectionId_ptr	
ObjectId	Soil pH Tolerance	collectionId_ptr	
ObjectId	Hardiness Zone	collectionId_ptr	
ObjectId	Heat Zone	collectionId_ptr	
ObjectId	Insect Intolerance	collectionId_ptr	

Translates to

#### Intrinsics\_Library

id	Layer value	plant list
ObjectId	climax	plantId_ptr,
ObjectId	understory	plantld_ptr,
ObjectId	shrub	plantId ptr,
ObjectId	herb	plantId_ptr,
ObjectId	ground cover	plantld_ptr,
ObjectId	climber	plantld_ptr,
ObjectId	clumper	plantld_ptr,
ObjectId	runner	plantld_ptr,
ObjectId	palm	plantld_ptr,
ObjectId		n plantId_ptr,
ObjectId	root crop	plantld_ptr,

Canopy Density			
_id	value	plant_list	
ObjectId	impenetrable	plantId_ptr,	
ObjectId	dense	plantId_ptr,	
ObjectId	moderate	plantId_ptr,	
ObjectId	sparse	plantId_ptr,	
ObjectId	almost none	plantId_ptr,	

Shade Tolerance			
_id	value	plant_list	
ObjectId	permanent deep	plantId_ptr,	
	shade	plantId_ptr,	
ObjectId	permanent shade	plantId_ptr,	
ObjectId	partial shade	plantId_ptr,	
ObjectId	light shade	plantId_ptr,	
ObjectId	no shade	plantId_ptr,	

(	Harvest Season			
l	_id	value	plant_list	
l	ObjectId	spring	plantId_ptr,	
l	ObjectId	summer	plantId_ptr,	
l	ObjectId	autumn	plantId_ptr,	
l	ObjectId	winter	plantld_ptr,	

Hardiness Zone			
_id	value	plant_list	
ObjectId	1	plantId_ptr,	
ObjectId	2	plantId_ptr,	
ObjectId		plantId_ptr,	
ObjectId	12	plantId_ptr,	

(	Heat Zone	e `
_id	value	plant_list
ObjectId	1	plantId_ptr,
ObjectId	2	plantId_ptr,
ObjectId		plantId_ptr,
ObjectId	12	plantId_ptr,

Salt Tolerance			
_ <b>id</b>	<b>value</b>	<b>description</b> Highly resistant to salt drift and can be used in exposed environments.	<b>plant_list</b>
ObjectId	tolerant		plantld_ptr,
ObjectId	moderately tolerant	Tolerate some salt spray, but grow best when protected from it.	plantId_ptr,
ObjectId	slightly tolerant	Should be protected from any spray.	plantld_ptr,
ObjectId	not tolerant		plantld_ptr,

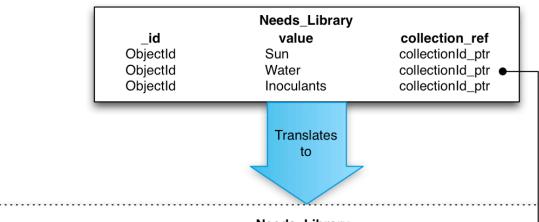
Flood Tolerance				
_ <b>id</b> ObjectId	<b>value</b> tolerant	<b>description</b> Survive high water table and flooded conditions for days to weeks.	<pre>plant_list plantId_ptr,</pre>	
ObjectId	moderately tolerant	Survive several days of excessively wet or flooded soil conditions.	plantld_ptr,	
ObjectId	not tolerant	Not tolerant of wet or flooded soil.	plantId_ptr,	

Drought Tolerance plant_list			
_ <b>id</b> ObjectId	<b>value</b> tolerant	description Tolerate lack of water for a few days to several weeks.	plantId_ptr,
ObjectId	moderately tolerant	Can withstand several days of drought with some stress effects.	plantld_ptr,
ObjectId	not tolerant	May survive a few days of drought, but with severe damage.	plantId_ptr,

Humidity Tolerance				
_ <b>id</b> ObjectId	<b>value</b> tolerant	description Can achieve normal growth in humidity greater than 70%.	plant_list plantld_ptr,	
ObjectId	moderately tolerant	Tolerates high humidity, but will decrease reproduction.	plantId_ptr,	
ObjectId	not tolerant	Cannot withstand high-humidity conditions and may incur damage.	plantld_ptr,	

Wind Tolerance				
_id	value	description	plant_list	
ObjectId	tolerant	Can survive winds from 110-130 mph	plantId_ptr,	
ObjectId	moderately tolerant	Can survive winds from 75-110 mph	plantld_ptr,	
ObjectId	slightly tolerant	Can survive winds from 55-75 mph	plantId_ptr,	
ObjectId	not tolerant	Can survive winds less than 55 mph	plantld_ptr,	

Soil pH Tolerance			
_id	value	description	plant_list
ObjectId	alkaline-tolerant	Can withstand pH greater than 8.5	plantId_ptr,
ObjectId	slightly alkaline-tolerant	Can withstand pH between 7-8.5	plantId_ptr,
ObjectId	slightly acidic-tolerant	Can withstand pH between 5.5-7	plantId_ptr,
ObjectId	acidic tolerant	Can withstand pH less than 5.5	plantId_ptr,



# Needs\_Library

Sun			
_id	value	plant_list	
ObjectId	full sun	plantld_ptr,	
ObjectId	partial sun	plantld_ptr,	
ObjectId	indirect sun	plantld_ptr,	
ObjectId	morning sun	plantld_ptr,	
ObjectId	afternoon sun	plantld_ptr,	

	Water	
_id	value	plant_list
ObjectId	low	plantId_ptr,
ObjectId	moderate	plantld_ptr,
ObjectId	high	plantld_ptr,
ObjectId	aquatic	plantId_ptr,

Inoculents			
_id	value	plant_list	
ObjectId	rhizobia bacteria	plantId_ptr,	
ObjectId		plantId_ptr,	

# Products\_Library \_id value collection\_ref ObjectId Food collectionId\_ptr ObjectId Raw Materials collectionId\_ptr ObjectId Medicinals collectionId\_ptr ObjectId Biochemical Materials collectionId\_ptr ObjectId Cultural and Amenity collectionId\_ptr

Translates to

## Products\_Library

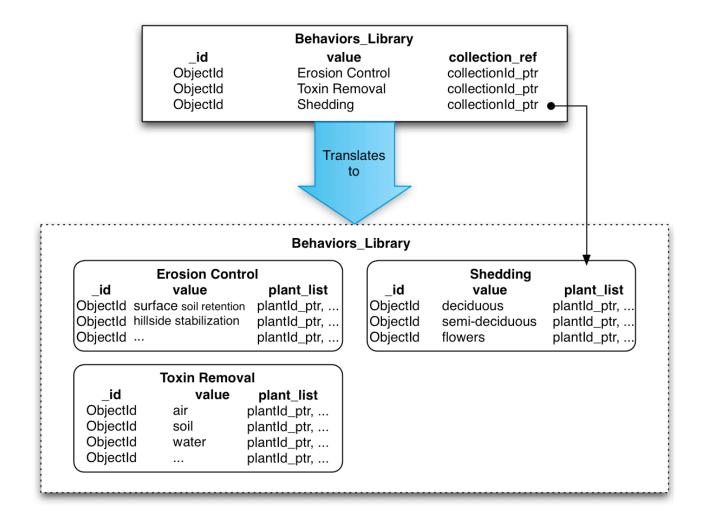
Food			
_id	value	plant_list	
ObjectId	greens	plantId_ptr,	
ObjectId	grains	plantId_ptr,	
ObjectId	vegetables	plantId_ptr,	
ObjectId	nuts	plantld_ptr,	
ObjectId		plantId_ptr,	

Raw Materials			
_id	value	plant_list	
ObjectId	biomass	plantId_ptr,	
ObjectId	timber	plantId_ptr,	
ObjectId	oil	plantId_ptr,	
ObjectId		plantId ptr,	

Biochemical Materials			
_id	value	plant_list	
ObjectId	detergent	plantld_ptr,	
ObjectId		plantld_ptr,	

Cultural and Amenity			
_id	value	plant_list	
ObjectId	aesthetic	plantld_ptr,	
ObjectId	recreational	plantld_ptr,	
ObjectId	artistic inspiration	plantld_ptr,	
ObjectId	spiritual inspiration	plantld_ptr,	
ObjectId	cultural heritage	plantld_ptr,	

Medicinals			
_id	value	plant_list	
ObjectId	antispasmodic	plantld_ptr,	
ObjectId		plantld_ptr,	



The general library stores those properties that are needed by several libraries. For example Nutrients are specified as a need, a product, and an intolerance (intrinsic char). The General Library also stores common properties for the general information of the plant (e.g. Endemic Status, and Family Name).

