**Components**

**Hardware:**

1. Processor: Intel Core i5 to i7 or higher, or other equivalents like Ryzen to help work with huge datasets

2. RAM: Minimum RAM recommended is 8GB for handling datasets, but for much bigger and complex datasets, a 16GB RAM is recommended.

3. GPU: Since the project deals with a lot of images and deep learning models, a good enough GPU is required to help speed up the modelling process

4. Internet connection: If working on cloud databases or servers, the need of a fast internet connection is necessary to download and upload data quickly.

**Software:**

1. Python, HTML, CSS, JavaScript: The core language used in this project is Python. The versatility of the language along with its extensive libraries and resources along with excellent machine learning support makes it the perfect choice. Python is used in this project to make the backend as well as the machine learning component. Whereas the frontend, designing and connection with the backend is done with HTML, CSS and JavaScript respectively.

2. YOLOv5 : It is the object detector used in the project. In comparison to other models, it provides faster execution and good accuracy.

3. Flask: To have a working frontend connected to a backend model, the framework we have used is Flask. Its simplicity and scalability makes the entire software easier to work on

4. Torch: The machine learning library with useful tools for deep learning, and user friendly research framework

5. OpenCV: The computer vision and image processing library used in the project. It contains necessary tools to work with images, object detection.

6. Pandas: To organize and process labelled data in the weed and crop database and helping in perform classifications.

7. PIL (Python Imaging Library): A library used to handle image data within Python, allowing the reading, writing, and manipulation of images.