

## **‘DWR Weedseed GURU’ android application**



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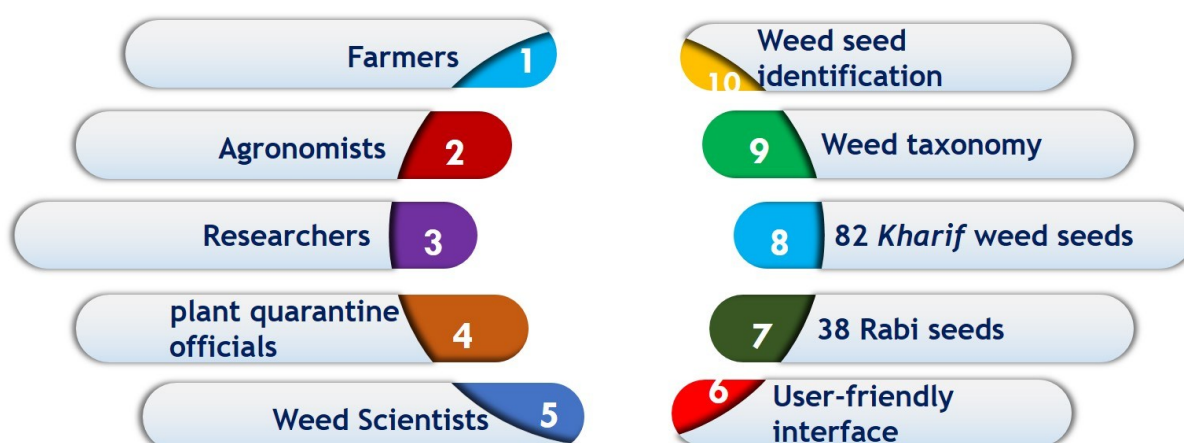
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## Introduction

Weed seed identification has long posed a significant challenge in the realm of agriculture and weed science. The complexity arises from several factors weed seeds occur in a vast array of sizes and shapes, often with distinct external features such as spines, ridges, wings, or hairs. These physical attributes not only vary between species but may also change depending on environmental conditions and seed maturity. Furthermore, some weed seeds bear a striking resemblance to seeds of crops or other plant species, making visual differentiation difficult without expert knowledge. The task is further compounded by the lack of detailed morphological descriptions and photographic documentation for many weed species, especially in field conditions where time and resources are limited.

### ‘DWR Weedseed GURU’ android application



In recognition of these difficulties, a specialized mobile application has been developed to revolutionize the process of weed seed identification. This user-friendly application allows users to identify weed seeds conveniently through visual selection using their smartphones. It integrates a comprehensive and meticulously curated database containing high-resolution seed photographs and taxonomic information for 82 *Kharif* and 38 *Rabi* season weed species that are commonly found in Indian agricultural fields.

The app's design emphasizes simplicity, accessibility, and scientific accuracy. Whether used in the field or laboratory, it serves as a powerful tool for farmers aiming to improve weed control strategies, agronomists seeking accurate field diagnosis, and researchers conducting ecological or agronomic studies. By enabling precise identification, this technology supports timely and informed decision-making in weed management reducing crop losses, improving herbicide selection, and promoting sustainable agricultural practices.

This innovative digital solution is not just a step forward in weed management; it is a leap toward bridging the gap between traditional taxonomy and modern technological tools. As agriculture faces increasing pressures from climate change, herbicide resistance, and crop productivity demands, such tools are essential to ensure efficient, accurate, and proactive management of weed flora. This bulletin introduces the features, scope, and utility of the application, highlighting its potential to transform weed seed identification and empower stakeholders across the agricultural value chain.

### **Uniqueness of the technology in comparison to existing ones**

- **Comprehensive database:** The app comprises a comprehensive database of seed photographs and taxonomic details of 82 *Kharif* and 38 *Rabi* season weeds commonly found in agricultural fields. This makes it more effective in identifying a wide range of weed species than other apps that may have limited data.
- **User-friendly interface:** The app has a user-friendly interface that allows users to identify weed seeds by selecting images on their smartphones. This feature makes it easier for users to navigate through the app and find the information they need.
- **Accurate identification:** The app uses image and identification to accurately identify weed species seeds. This technology is more reliable than other identification methods that rely on user input or manual identification.

### **Methodology**

- a. **Requirement gathering:** Collected information about the target audience, their needs, and the type of features they would like to have in the app. This step involved interviewing farmers and agronomists, and analyzing the current weed identification methods.
- b. **Design and development:** Once the requirements are identified, the app design and development process was done. The team designed a user-friendly interface, developed a comprehensive database of seed photographs and taxonomic details of weeds, and integrate image recognition and identification technology.
- c. **Testing:** After developing the app, it needs was tested extensively to ensure its accuracy and functionality. The testing process included testing the app's ability to identify different weed species, checking the app's response time, and ensuring its compatibility with different Smartphones.

- d. **Deployment:** After completing the testing phase, the app has been deployed to the ‘Google play store’ for public use. This step involves preparation of the app for release, optimizing its performance, and publishing it on the ‘Google play store’.
- e. **User feedback and updates:** After the releasing the app, user feedback has been collected and analyzed to identify areas for improvement. Regular updates to the app will be released to improve its accuracy and functionality based on user feedback.



### Step wise user guide for ‘DWR Weedseed GURU’ android application

‘DWR Weedseed GURU’ is a user-friendly mobile application developed to aid in the identification of weed seeds. It hosts a comprehensive database with high-quality images and taxonomic details of 82 *Kharif* and 38 *Rabi* season weeds commonly found in agricultural fields across India. This app is a valuable resource for farmers, agronomists, scientists, and plant quarantine officials for accurate and timely weed seed identification.

#### Step 1: Installation

- **Via Google Play Store:**
  - Open the Google Play Store on your Android device.
  - Search for “DWR Weedseed GURU”.
  - Tap on the app icon and click Install.
- **Via Official Website:**
  - Visit the ICAR-DWR official website: <http://dwr.icar.gov.in>
  - Navigate to the download section and follow the link to download the app directly.

#### Step 2: Launching the App

- After installation, locate the app icon on your smartphone and tap it to open.
- Upon first launch, grant necessary permissions (e.g., storage, internet access) if prompted.

### Step 3: Exploring the App Interface

The home screen provides easy navigation to the key features:

- *Kharif* Weeds Database (82 species)
- *Rabi* Weeds Database (38 species)
- Search and Identify Feature
- Allows identification by selecting images that match the weed seed in question.

#### Taxonomic Details

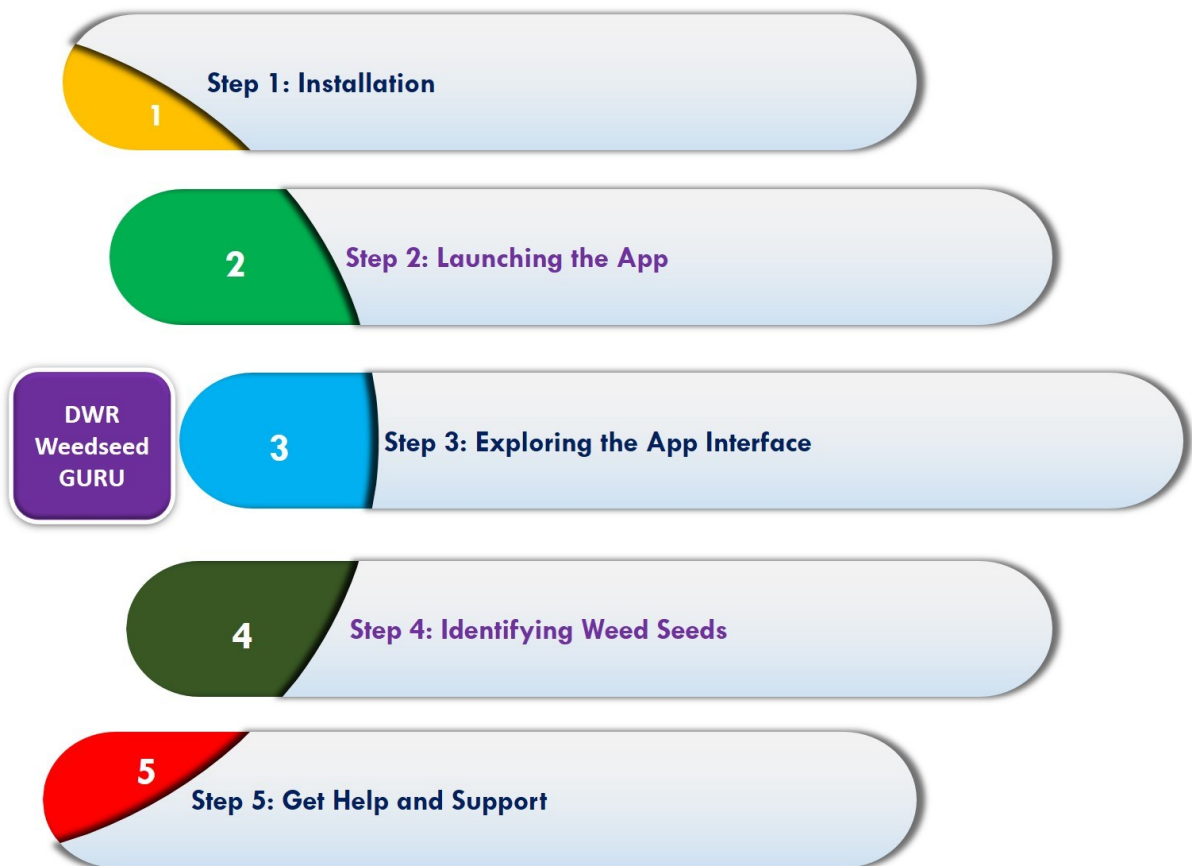
- Each weed species is accompanied by Scientific and common names

### Step 4: Identifying Weed Seeds

- Tap the “Identify Weed Seed” option.
- Browse through images or use keyword search (by seed trait or name).
- Compare your sample with app images.
- Tap on a matching seed to access detailed taxonomic information and identification confirmation.

### Step 5: Get Help and Support

- Navigate to the Help section for guidance on app usage, troubleshooting tips, and contact details for technical support.



## Results

It allows users to identify weed seeds by selecting images on their smartphones and comprises a comprehensive database of seed photographs and taxonomic details of 82 *Kharif* and 38 *Rabi* season weeds commonly found in agricultural fields. The app is designed to be user-friendly and provides accurate identification of weed species, making it an invaluable tool for farmers, agronomists, and scientists seeking to manage weed infestations in their fields effectively. Also, this will be a useful tool for plant quarantine officials for identifying weed seeds that are already existing in India.

## Benefits of the technology

### a. Weed management:

- By accurately identifying the weed species present in a field, farmers and agronomists can:
- Choose the most effective herbicides to target specific weeds, thereby reducing unnecessary chemical applications.
- Implement cultural control measures, such as timely weeding or crop rotation, and adopt integrated weed management (IWM) practices to enhance sustainability.
- Optimize the timing of weed control measures to prevent seed set and minimize future weed infestations.

### b. Quarantine measures:

- The kit provides an efficient method for plant quarantine officials to identify invasive or quarantine weed species.
- By identifying weed seeds that are already present in India, the kit helps prevent the entry and establishment of new invasive weed species, thereby safeguarding agricultural ecosystems.

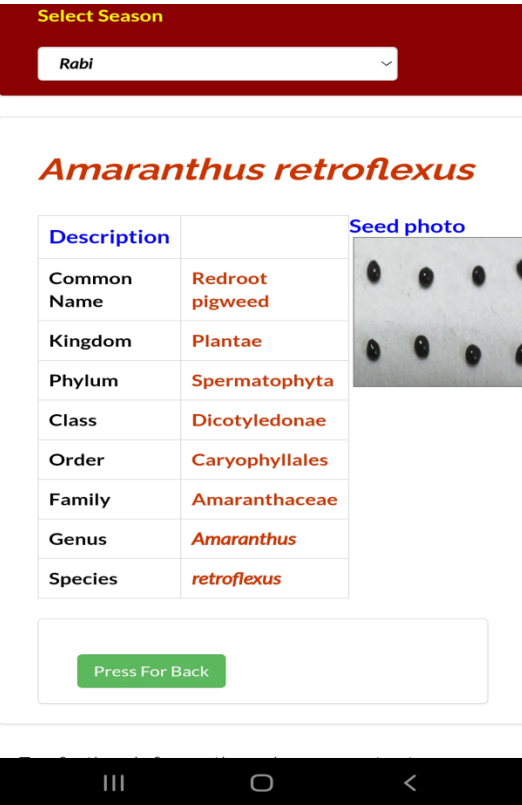
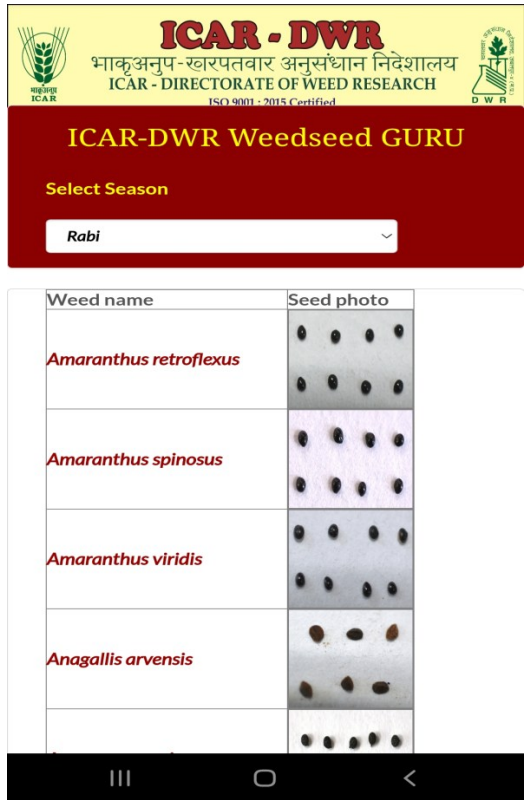
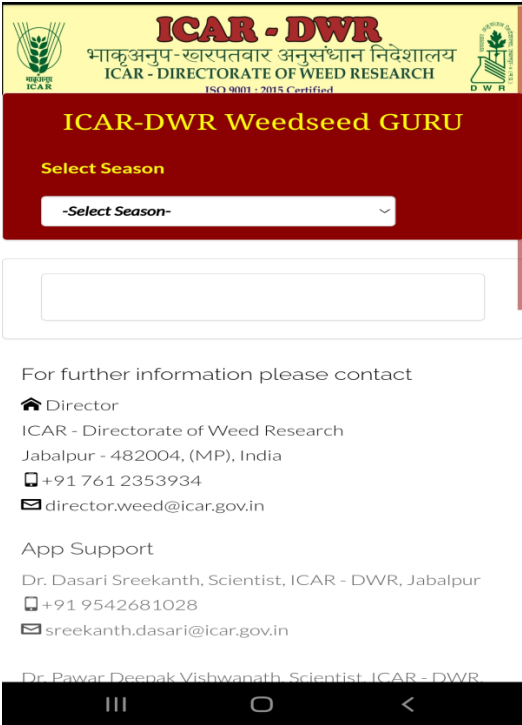
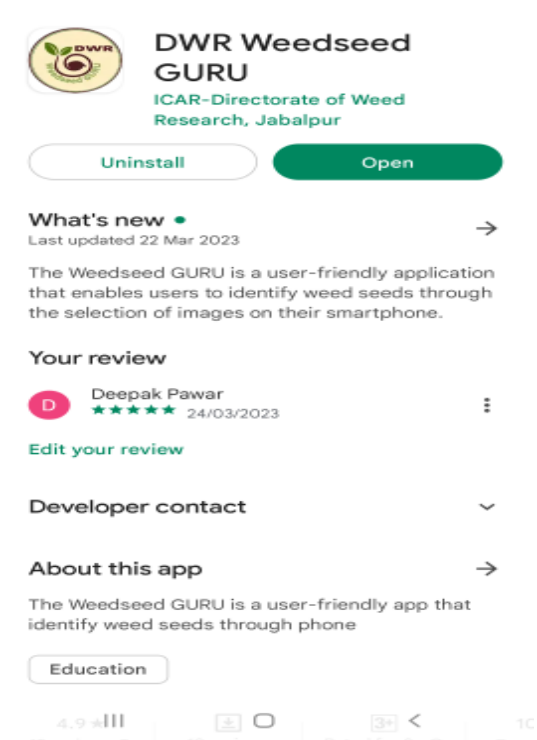
### c. Educational and research tool:

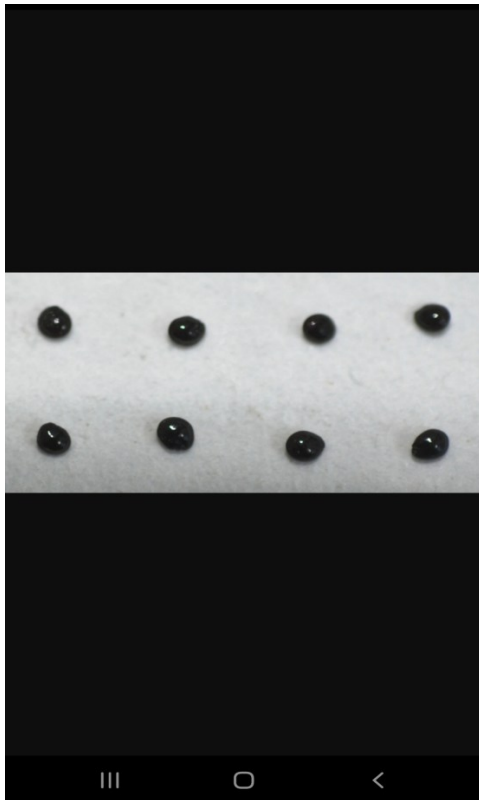
- The app is a valuable resource for teaching weed science in academic settings, allowing students to study and understand weed seed morphology.
- Researchers can use the kit to conduct studies on weed demographics, seed bank analysis, and the impact of climate and management practices on weed populations.

## Upscaling

As part of technology upscaling, the application is being promoted for wider adoption through integration with agricultural extension services, training programs, and awareness campaigns. It offers a scalable solution that enhances decision-making in weed management,

seed certification, and quarantine operations. By harnessing mobile technology, Weedseed Guru bridges the gap between digital tools and field-level weed management, ensuring accessibility, efficiency, and precision in weed seed identification across diverse agro-climatic regions.





| Weed name                     | Seed photo |
|-------------------------------|------------|
| <i>Abolmoschus moschatus</i>  |            |
| <i>Abutilon indicum</i>       |            |
| <i>Achyranthus aspera</i>     |            |
| <i>Aeschynomene americana</i> |            |
|                               |            |



| <i>Abolmoschus moschatus</i> |                    |
|------------------------------|--------------------|
| Description                  | Seed photo         |
| Common Name                  | Musk Mallow        |
| Kingdom                      | Plantae            |
| Phylum                       | Spermatophyta      |
| Class                        | Dicotyledonae      |
| Order                        | Malvales           |
| Family                       | Malvaceae          |
| Genus                        | <i>Abolmoschus</i> |
| Species                      | <i>moschatus</i>   |



