

## Expansion of coriander variety ACr-1 in Haroti region of Rajasthan

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### Abstract

Coriander is the main seed spice crop grows successfully in Baran district of Rajasthan. It can be grow successfully in late sown condition up to 15<sup>th</sup> November with optimum yield. The leaves are generally used in rainy and summer season as a vegetable and seed are used as spices. Rajasthan and Gujarat have been emerged as "Seed spice bowl" and together contribute more than 80% of total seed spices produced in the country and to some extent grown in Andhra Pradesh, Gujarat and Madhya Pradesh. The coriander is sold in local market in the nick name of 'haroti dhanial'. Since, 2013-14 the demand of Ajmer coriander is drastically high only due to the stem gall resistant. Now it is popular in the district as Ajmeri dhanial of longia disease resistant.

**Key words:** Coriander, seed spices, stemgall resistant, haroti, Rajasthan

### Introduction

Baran district of Rajasthan is famous for coriander cultivation account for 28215ha land during the year 2015-16 and highest acreage of 90683ha covered in the year 2008-09 (table 1). The other spices like fenugreek, fennel, nigella, ajwain grown to some extent. Natural resources are changing day by day due to the changing of earth revolution, light radiation, moon shining, earth gravitational force, wind velocity, temperature and rainfall etc (Singh, *et.al.*, 2010). The production and productivity of coriander was drastically reduced (1.0q ha<sup>-1</sup>) during the year 2014-15 due to the severe incidence of stem gall disease in commercial cultivated varieties RCr-436 and CS-6 (Table 1). In winter season about 40-45 days were fogginess and lacking of sunshine during the year 2013-14 and 2014-15. In these conditions only Ajmer coriander-1 was found to safe against stem gall and frost.

### Expansion of coriander variety ACr-1

Generally farmers are using old varieties of coriander like CS-6, RCr-436 and local for commercial cultivation and it is severely affected with stem gall disease since two years. Therefore, a varietal demonstration of coriander variety ACr-1 conducted in 2.0 ha land at five farmer's field in

Baran district of Rajasthan in collaboration of NRCSS, Ajmer during the year 2013-14. Our centre demonstrated 4.10 q seed of coriander variety ACr-1 in 20 ha piece of land and 2.0 q seed of same variety was demonstrated by Kisan Call Centre in 10 ha land for seed production during the year 2014-15. About 10 q seed of coriander produced by four farmer's yield were distributed to other district famers for cultivation. The progressive farmer's of the district were perceive the technologies and live demonstration from NRCSS, Ajmer through kisan mela, trainings, workshops and symposium since 2009-10. The total of 16.10 q seed was distributed among the 300 farmers in whole district during the year 2014-15. In this year also it is free from the stem gall disease and the other variety is suffering from the stem gall disease (*Rajasthan Patrika*, December 2015) in Nahargarh area of Baran district of Rajasthan. The area of coriander during the year 2015-16 was drastically decreased to 28215 ha due to the demand of farmer to sown only Ajmeri dhanial, in which about 4220 ha was covered with the variety of ACr-1 (table 1). The expansion of 15% coriander area with ACr-1 is only due to the stem gall resistant and major area is spread through the supply of seed was from farmer to farmer (table 2).

**Table 1.** Area and production of coriander in Baran district of Rajasthan

| Year    | Area (ha) | Production (Q ha <sup>-1</sup> ) | Productivity (Q ha <sup>-1</sup> ) |
|---------|-----------|----------------------------------|------------------------------------|
| 2008-09 | 90683     | 1449115                          | 15.98                              |
| 2009-10 | 77420     | 824523                           | 10.65                              |
| 2010-11 | 59979     | 86179                            | 14.37                              |
| 2011-12 | 85432     | 115321                           | 13.50                              |
| 2012-13 | 45890     | 66071                            | 14.40                              |
| 2013-14 | 47666     | 12107                            | 2.54                               |
| 2014-15 | 52781     | 50490                            | 1.0                                |
| 2015-16 | 28215     | NA                               | NA                                 |

**Table 2.** Area and distribution of coriander seed variety ACr-1 during the year 2014-15 and 2015-16.

| SNo.           | Seed distribution agency | Quantity (Q)  | Area covered (ha) | No of farmers |
|----------------|--------------------------|---------------|-------------------|---------------|
| <b>2013-14</b> |                          |               |                   |               |
| 1.             | NRCSS, Ajmer             | 0.30          | 2.0               | 5             |
| <b>2014-15</b> |                          |               |                   |               |
| 1.             | K.V.K., Anta             | 4.10          | 20                | 100           |
| 2.             | Kisan Call Centre        | 2.00          | 10                | 50            |
| 3.             | Farmers own seed         | 10.00         | 50                | 150           |
|                | <b>Total</b>             | <b>16.10</b>  | <b>80</b>         | <b>300</b>    |
| <b>2015-16</b> |                          |               |                   |               |
| 1              | K.V.K., Anta             | 2.0           | 13                | 50            |
| 2.             | Kisan Call Centre        | 1.0           | 5                 | 10            |
| 3.             | Farmers own seed         | 640           | 4200              | 4350          |
| 4.             | K.V.K., Anta farm        | 0.35          | 2.0               | -             |
|                | <b>Sub total</b>         | <b>643.35</b> | <b>4220</b>       | <b>4410</b>   |
|                | <b>Total</b>             | <b>650.75</b> | <b>4302</b>       | <b>4715</b>   |

## Methodology

The coriander variety ACr-1 was tested at four farmer's field in 2.0 ha piece of land in Bagli, Chatrapura, Udupuria and Bhawargarh village of Baran district of Rajasthan during the year 2013-14 in collaboration of NRCSS, Ajmer. The coriander seed were sown in last week of October and harvested in last week of March in both the year. All cultural operations were carried out as per schedule of package of practices. The performance of front line demonstration variety ACr-1 were compared with local varieties grown by farmers are RCr-436 and CS-6. Agro techniques of coriander were published in local news papers and major pesticides are to be provided to district farmer in

subsidy by state government of Rajasthan. Stem gall disease fungicides are available in market during this year 2015-16 on subsidy by Horticulture department of Rajasthan (*Danik Bhasker*, January, 2016). The district farmers are advised to grow mustard around the coriander variety ACr-1 for commercial seed production during the year 2015-16. The total of 643.35 q seed was distributed among the 4410 farmers in whole district during the year 2015-16 (Table 2). An intensive seed production programme of coriander variety ACr-1 was conducted in village Pakalkheri during the year 2015-16 by Krishi Vigyan Kendra, Anta, Baran.

## Performance of Coriander Variety ACr-1

Performance of coriander variety ACr-1 was better than commercially grown RCr-436 and CS-6 varieties grown in whole Baran district of Rajasthan (Table 3). Highest yield (11.98q ha<sup>-1</sup>) was recorded in variety ACr-1 followed by RCr-436 and local variety CS-6. Similar increase in yield of coriander variety ACr-1 was also reported by Lal *et.al.*, (2015) due to the resistant to stem gall disease in Baran district of Rajasthan. The increase of yield was due to the increase the number of branches per plant. Vegetative growth of the variety RCr-436 and CS-6 was severely affected by the disease. Although seed boldness of the variety RCr-436 and CS-6 was liked by the whole district of the famers but incidence of disease failure the crop yield. The highest yield performance of ACr-1 was due to the free from the stem gall disease and minimum injury of frost to the plant. The own variety CS-6 grown by the farmers are severely affected by stem gall and harvested lowest yield (3.45q ha<sup>-1</sup>). Lower yield of coriander was due infestation stem gall disease and frost injuries during vegetative growth and flowering period. The variety RCr-436 was moderately affected by stem gall and produced 6.32q/ha seed yield of coriander. However, the variety grown by the farmers under the demonstration programme of NRCSS, Ajmer was found very effective against stem gall disease and it is also used by the farmer for green leaves purpose. A field day programme was organised at Bagli village on the visual performance of coriander variety ACr-1.

**Table 3.** Performance of coriander variety ACr-1 during the year 2014-15

| Treatment | Plant height (cm) | No of branch | Root   |             | No of umbellets umbel <sup>-1</sup> | No of seed umbel <sup>-1</sup> | 1000 seed wt.(g) | Yield q ha <sup>-1</sup> |
|-----------|-------------------|--------------|--------|-------------|-------------------------------------|--------------------------------|------------------|--------------------------|
|           |                   |              | Number | Length (cm) |                                     |                                |                  |                          |
| ACr-1     | 123.14            | 39.39        | 18.27  | 18.40       | 7.1                                 | 59.33                          | 11.32            | 11.98                    |
| RCr-436   | 55.37             | 29.78        | 10.43  | 11.01       | 7.0                                 | 43.02                          | 15.26            | 6.32*                    |
| CS-6      | 51.36             | 24.01        | 8.59   | 10.99       | 7.0                                 | 42.19                          | 15.38            | 3.45*                    |

\*The yield of coriander variety RCr-436 and CS-6 was low only due to the severe incidence of stem gall.

### Occurrence of crow in coriander Variety ACr-1

A tree provides the shelter for birds and birds are surviving on plants and animal based food. On the basis of economic importance the birds are classified into two categories: first is a Harmful bird – in this category crop damaging birds are included e.g. crow, parrot, sparrow, pigeon and bat etc. and second is a Beneficial birds – in this category useful birds to the crop are included e.g. maina.

It is the first report that the maximum occurrence of crows flocks and his stay duration in coriander field was found during the 3-6 PM (table-4). They eat tender leaves and after sun set they fly in the sky and back to his nest. The other varieties like CS-6, RCr-436 and local are free from the damage. The initial data in table 5 showed that after the eating of leaves the number of re sprouted leaves and its length was higher than other varieties. The eating of coriander variety ACr-1 leaves by crows was depicted in Fig.-1 One leaf cutting of coriander increased the total net return of crop (Datta *et.al.* 2008).

**Table 4.** Occurrence of crows flocks in coriander field during the year 2015-16.

| Time     | No. of crows ha <sup>-1</sup> | No. of flocks | duration (hrs) |
|----------|-------------------------------|---------------|----------------|
| 6-8 AM   | 4-7                           | 1             | 3-4            |
| 8-10 AM  | 6-7                           | 1             | 4-5            |
| 10-12 AM | 00                            | 00            | 00             |
| 12-2 PM  | 00                            | 00            | 00             |
| 2-4 PM   | 39-51                         | 4             | 5-7            |
| 4-6 PM   | 114 -127                      | 12            | 5-7            |

**Table 5.** Vegetative growth of different varieties of coriander during the year 2015-16.

| Varieties | Number of leaves | Length of leaves (cm) |
|-----------|------------------|-----------------------|
| CS -6     | 6.7              | 7.41                  |
| RCr -436  | 9.3              | 12.24                 |
| ACr -1    | 15.8             | 28.75                 |

**Fig.1.** Occurrence of crows flocks in field of coriander variety ACr-1

### Farmer's reaction

The farmer's response of the variety ACr-1 is given below:

1. It is resistant to stem gall disease.
2. The shiny foliage of variety ACr-1 attracts the crows to eat the soft leaves of during the year 2015-16. The number of branches was found greater in leaf eaten plant than control after 15 days of flock occurrence.
3. Seed rate is low.
4. Growth and germination of this variety is superior than other variety
5. It is useful for seed as well as leafy vegetable purpose.
6. Seed size is small. The district farmer requires bold seed varieties.

7. It takes about 140-145 days to maturity.
8. The height of plant increased up to 123 cm but lodging was not occurred.
9. Yield performance of this variety ACr-1 was superior to other variety during both the year.

#### **Extension activities**

First time only progressive farmers are adopted the variety for cultivation. The other farmers are not interested to sow the seed due to the small seed size. Since two years the occurrence of continuous humidity up to 45 days during the December-January and the coriander crops are severely affected with the diseases. The variety ACr-1 was only safer under such condition. A field day was organised at Bagli during the year 2013-14 and an oil extraction company representative was also visited in the field of coriander grower farmer Arjun Lal Nagar. During the year 2014-15 the cultivation of coriander was become highlighted in Rajasthan Assembly due to the severe incidence of stem gall disease and Honourable Agriculture Minister Shri Prabhu Lal Saini visited several times to the field of coriander. In this situation he instructed to the government agency to supply resistant coriander variety ACr-1 to the farmers. This variety was also discussed in SAC meeting of Krishi Vigyan Kendra, Anta, ZREAC meeting at ARS, Kota and other different plate form. Its performance was also coverage in different news papers for long time. A field day was also organised during the year 2014-15 at village Balapura and convey to the farmers to save the produce as a seed for the year 2015-16.

During the year 2015-16 an experiment was conducted by NRCSS, Ajmer and other experiment was conducted on different date of sowing of coriander for the assessment of stem gall disease at Krishi Vigyan Kendra, farm. The performance of experimental coriander was depicted in fig-2



**Fig.2.** Growth of coriander in different dates of sowing.

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Received : September 2015; Revised : November 2015;  
Accepted : December 2015.