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Short Communication

Studies on Standardization of Seed Priming of Kabuli Chickpea for Seed Quality and Yield Enhancement

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Seed priming is a pre-sowing treatment that involves exposure of seeds to low external water potential that limits hydration. This hydration is sufficient to permit pre-germinative metabolic events but insufficient to allow radicle protrusion through the seed coat. This technique has become a common seed treatment that can increase emergence, growth, yield and salt tolerance mainly under unfavorable environmental conditions[1]. It is an easy, low cost and low risk technique, which is recently being used to overcome the salinity problem in agricultural lands (Neto and Tabosa, 2000). Seed priming stimulates many of the metabolic processes involved in the early phases of germination, and it has been noted that seedlings from primed seeds emerge faster, grow more vigorously, and perform better in adverse conditions. Some of the factors that affect seed priming response are solution composition and osmotic potential. Seed priming increases yields of chickpea and other rainfed crops; it hastens germination, enhances crop establishment and promotes seedling vigor[2]. It is therefore, considered worthwhile to evaluate seed priming for its efficacy for chickpea.

The present investigation on kabuli chickpea variety JGK 2 was conducted during Rabi 2015-16 at STR Unit, JNKVV, Jabalpur with three replicates. The seed priming treatments consist of ten treatments viz., T_1 : Control (untreated), T_2 :*Trichoderma harzianum*@ 1.5% (1.5 g /kg of seed), T_3 :Vitavax Power @0.25% (2.5 g /kg of seed), T_4 :Gibbrellic acid @ 50 ppm, T_5 :Gibbrellic acid @ 50 ppm + seed coating with *Trichoderma harzianum* @ 15 g/ kg of seed, T_6 :Sodium Molybdate @500ppm, T_7 :Sodium Molybdate @500ppm +seed coating with *Trichoderma harzianum*@ 15 g/ kg of seed, T_8 :Leaf extract of *Lantana camera* @10%, T_9 :Seed hydration for 8 hours and T_{10} : Chemical check - Bavistin @3 g /kg seed The different observations of yield and yield attributing traits were recorded.

Results and Discussion

The seed priming with different seed treatments (Table 1) showed significant difference for enhancing yield and yield contributing characters in Kabuli chickpea. Out of ten seed priming treatments including control the differential impact of seed treatments was observed. The maximum biomass was produced (55.0g) under the seed hydration for 8 hrs (T_8) followed by seed priming with sodium molybdate @ 500 ppm + seed coating with *Tricoderma harzianum* @ 15g/ kg seed. Hydro-priming improves the seed quality by restoring the membrane permeability, it also initiates the

activities of hydrolyzing enzymes at faster rate leading to rapid and uniform seedling emergence and establishment in the field. The highest number of pods was noted (80.53) under seed priming with sodium molybedate @ 500 ppm + seed coating with *Trichoderma harzianum* @ 15 g/kg of seed (T_6) whereas, the maximum seed weight was also observed under seed priming with sodium molybedate @500 ppm.

The highest number of seed per pod was recorded under (T_7) seed priming with leaf extract of *Lantana camera* @10%, whereas, seed yield (g)/plant (27.80g) and harvest index(60.83%) was registered highest under seed priming with sodium molybedate @ 500 ppm + seed coating with *Trichoderma harzianum* @ 15 g/kg of seed (T_6). Therefore the seed priming showed significantly improved yield of Kabuli chickpea[3].

It can be concluded that sodium molybedate @ 500 ppm + seed coating with *Trichoderma harzianum* @ 15 g/kg of seed (T_6) was best among all treatments. Molybdenum is an essential micronutrient for chickpea. Tiny amounts of molybdenum improve Rhizobium nodulation. Soaking seed in water alone dramatically improves germination. But, priming seeds with molybdenum raises yields by a third compared to priming with just water. However, *Trichoderma spp*. are common saprophytic fungi found in almost any soil as rhizospheremycoflora, and have been investigated as potential inducers of growth and resistance in plants because of their ability to reduce the incidence of diseases caused by plant pathogenic fungi, particularly many common soil borne pathogens

Table 1 Effect of different seed priming treatments on yield and yield attributes of kabuli chickpea

Treatments	Biomass/ plant (g)	pods/ plant	100 seed wt(g)	Seeds/ pod	Seed yield/ plant (g)	harvest index
T_1	43.33	60.27	22.54	1.00	20.22	46.69
T_2	30.33	46.20	23.11	1.00	19.14	62.52
T_3	40.00	56.53	22.67	1.00	20.40	50.73
T_4	50.67	50.60	21.38	1.00	18.66	36.78
T_5	42.33	62.33	22.22	1.00	25.11	59.36
T_6	53.33	80.53	24.40	1.00	26.73	50.20
T_7	40.00	79.60	23.71	1.07	24.33	60.83
T_8	55.00	80.40	23.69	1.00	27.80	50.49
T_9	46.67	72.87	23.09	1.00	21.93	47.03
T_{10}	36.00	45.37	23.63	1.00	18.78	52.25
SEd±	1.84	5.8	1.12	0.02	1.36	1.91
CD at 5%	3.87	12.1	2.36	0.04	2.87	4.01

References

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