

Efficacy of NSKE (Neem Seed Kernel Extract) on *Asparagus racemosus* Wild

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ABSTRACT

Asparagus is famous for its culinary and medicinal uses. Although it is a native to the western European coasts, it has now been widely naturalized in India; Himachal Pradesh is the primary producer. Organic farming is an agricultural system that uses fertilizers of organic origin such as compost manure, green manure (Neem kernel). There are three plant diseases that affect the Asparagus plant which can be controlled by the spray of NSKE (Neem Seed Kernel Extract).

Keywords: Asparagus; NSKE; Crown rot disease; Spray; Rust disease; White mold

DESCRIPTION

Organic farming is an agricultural system that uses fertilizers of organic origin such as compost manure, green manure (Neem kernel). It originated early in the 20th century in reaction to rapidly changing farming practices.

The concepts of organic agriculture were developed in the early 1900s by Sir Albert Howard, F.H. King and Rudolf Steiner who believed that the use of animal manures (often made into compost), cover crops, crop rotation, and biologically based pest controls resulted in a better farming system.

Howard, having worked in India as an agricultural researcher, gained much inspiration from the traditional and sustainable farming practices he encountered there and advocated for their adoption in the West [1].

Asparagus is famous for its culinary and medicinal uses. Although it is a native to the western European coasts, it has now been widely naturalized in India; Himachal Pradesh is the primary producer.

As the vegetable not commonly available in the local markets, it remains in high demand [2].

There are three plant diseases that affect the Asparagus plant
a) Crown and root rot of asparagus, caused by two species of *Fusarium* (*Fusarium oxysporum f.sp. asparagi* and *Fusarium proliferatum*) (Figure 1).

b) Asparagus rust, caused by *Puccinia asparagi*, is an extremely complex fungal disease that threatens crops throughout the world (Figure 2).

c) White mold infests Asparagus infected by *Sclerotinia sclerotiorum* (Figure 3).

The control measures involve treatment of the seeds with hot water or disinfectants to produce disease-free seedlings.

The plant vigor is maintained by proper fertilization and proper weeding.

Management of *Fusarium* crown and root rot is difficult as the plant propagates from both seeds and crowns. But to grow from crowns would take around three years, and to grow the plants from roots, it takes two years only. Usage of fungicide is of little value as it is less effective.

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Figure 1: Asparagus showing crown rot /asparagus treated by Neem Seed Kernels Extract (NSKE).



Figure 2: Asparagus showing white mold /asparagus treated by Neem Seed Kernels Extract (NSKE).



Figure 3: Asparagus showing rust /Asparagus treated by Neem Seed Kernels Extract (NSKE).

Neem plant

Azadirachta indica and *A. Juss* (Meliaceae) commonly known as Neem or vembu in Tamil, nimba in Hindi in India (Figure 4). The plant is widely distributed throughout India. Plant was collected from college campus, Guru Nanak College, Chennai, and identified, authenticated by CSMDRIA, Chennai where a voucher specimen is maintained. A Neem tree normally begins bearing fruit after 3-5 years, and fully productive in 10 years, later can produce up to 50 kg of fruits annually. Fruit is a smooth, ellipsoidal drupe, up to almost 2 cm long. When ripe, it is yellow or greenish yellow and comprises a sweet pulp enclosing a seed. The seed is composed of a shell and a kernel (sometimes two or three kernels), each about half of the seed's weight (Figure 5). It is the kernel that is used most in pest control.



Figure 4: Neem Plant bearing fruit .



Figure 5: Neem seeds and Neem seed kernels (NSK).

Preparation of neem kernel extract

5 kilogram of the kernel is pounded in a mortar and pestle and soaked in 10 liters of distilled water for one day. After 24 hours the solution becomes milky white then detergent soap from Khadi 200g is added stirred with a wooden Planck. Filter through double layer of muslin cloth and make the volume to 100 liter. Finally filtered and stored for further use. The shelf life of this Neem Kernel Extract is one week or seven days (Figure 6). The precautions are the Neem fruits are collected during bearing season and shade dried, the seeds over eight months of age are not used. The seeds stored over and above this age lose their activity and hence not fit for NSKE preparation. Always use freshly prepared Neem seed kernel extract (NSKE). The solution is sprayed after 3.30 pm to get effective results [4].



Figure 6: Ingredients of Neem Seed Kernels Extract (NSKE).

Extract preparation

NSKE was stirred with the solvent water, 2:1 v/v.

Experimental plant *Asparagus racemosus wild*

Asparagus commonly called as sparrow grass, scientific name *Asparagus officinalis*, Asparagaceae is a perennial flowering plant, young shoots are used as a spring vegetable grows upto 100-150 cm tall, [3] with stout stems with much-branched, feathery foliage. The "leaves" are needle-like cladodes. The root system, often referred to as a "crown," is adventitious and the root type is fasciculated. The flowers are bell-shaped, greenish-white to yellowish, it is usually dioecious, with male and female flowers on separate plants, but sometimes hermaphrodite flowers are found. The fruit is a small red berry 6-10 mm in diameter, which is toxic to humans (Figure 7).



Figure 7: Methodology in preparation of Neem Seed Kernels Extract (NSKE).

Application method

It is applied as a foliar spray on the plant. Various concentrations such as 1, 10, 100, 1000 µg/L with the stock solution having NSKE: water, 2:1 v/v

The spray of NSKE on *Asparagus* at time intervals of 24 hours, 48 hours and 72 hours showed effective results. The results are shown in Tables 1A-1C.

S.No	Name of the disease	Concentration of the extract (NSKE)	Time interval	Serial number
1	Asparagus crown and root rot	100	24	85
		1000	24	100
		100	48	90
		1000	48	100
		100	72	98
		1000	72	100

Table 1A : Efficacy of NSKE on Asparagus plant.

S.No	Name of the disease	Concentration of the extract (NSKE)	Time interval	Serial number
1	Asparagus rust	100	24	100
		1000	24	100
		100	48	100
		1000	48	100
		100	72	100
		1000	72	100

Table 1B: Efficacy of NSKE on Asparagus plant.

S.No	Name of the disease	Concentration of the extract (NSKE)	Time interval	Serial number
1	White mold of asparagus	100	24	95
		1000	24	100
		100	48	100
		1000	48	100
		100	72	100
		1000	72	100

Table 1C: Efficacy of NSKE on Asparagus plant.

CONCLUSION

All the three diseases infecting the plant were controlled by the Neem seed kernel extract within 24 hours interval and at 10 μ L. Hence the efficacy of Neem seed kernel extract on the *Asparagus Racemosus* Wild is effective on fungus. So Asparagus is famous for its culinary and medicinal uses.

REFERENCES

1. Ramesh P, Singh M, Subba RA. Organic farming: Its relevance to the Indian context. *Current Scientist*. 2005; 88(4): 561-568.
2. William Davis A. "Buried treasure: white asparagus". *The Christian Science Monitor*. Schwetzingen, Germany. 2008
3. Bhowmik PK, Matsui T, Ikeuchi T, Suzuki H. Changes in storage quality and shelf life of green asparagus over an extended harvest season. *Postharvest Biol Technol*. 2002; 26(3):323-328.
4. Ley SV, Denholm AA, Wood A. The chemistry of azadirachtin. *Na Prod Rep*. 1993; 10(2):109-115.