

P14. Seed pelleting and bacterization of Sesame (*Sesamum indicum*) for plant growth enhancement and soil borne disease control

Kim, S.H., C.S. Park, H.J. Cho and S.M. Lee

Germplasm and Seed Technology Institute, College of Agriculture, Gyeongsang National University, Chinju, Gyeongnam 660-701

Seed pelleting of sesame is very useful to solve the difficulties in direct seeding especially mechanized seeding. The size of seed can be freely adjusted for sowing machine, save amount of seed for seeding and thinning labor after emergence. Seed pelleting also enable to introduce beneficial bacteria in pelleting material. Seed bacterization resulted suppression of soil borne diseases and enhancement of crop growth.

Several pelleting materials such as vermiculite, talcum and perlite were tested for pelleting material. Among them the shape, uniformity and hardness of the seeds pelleted by mixture of vermiculite(1) : talcum(4) : perlite(1) was most desirable since talcum and perlite-pellet broke readily in moisture soil and absorbed the water inside.

Therefore it showed most rapid germination not only in optimum moisture condition but excess or limited condition. Because of oil seed nature of sesame, attachment of bacteria on the seed surface or invasion inside seed-coat were not easy. Acetone was used to remove the fatty substances in seed coat. The sesame seeds were soaked in pure grade acetone solution for 5 seconds and dry immediate after. Then soaked in bacterial suspension. Acetone treatment did not show any harmful effect on the seed germination. Polyvinyl alcohol 1.0% on the prior process of pelleting and 2% on the latter of that were suitable as sticker to make sesame seed pellet.

Tel : (055)751-5426

E-mail : shkim@gshp.gsnu.ac.kr

Table 1. The shape, uniformity and hardness of the seeds pelletized with vermiculite, talcum and perlite, alone or in combinations

| Combination | Shape | Uniformity | Hardness |
|-------------|-------|------------|----------|
| V | *** | **** | **** |
| T | *** | *** | **** |
| P | *** | *** | *** |
| V+T | **** | **** | ** |
| V+P | *** | ** | *** |
| V+T+P | **** | **** | *** |

V: vermiculite, T: talcum, P: perlite.

**** excellent, *** good, ** usually, * bad.

Polyvinyl alcohol(PVA) were sprayed by 1.0% on the prior process of pelleting and 2.0% on the latter of that.

Table 2. Growth characteristics, yield and population density of *Bacillus polymyxa* E681 on sesame root after seed treatment in field condition

| Treatment | Culm length (cm) | Branches number | No. of capsules /plant | Disease (0~9) | Yield | | Density of rhizobacteria (cfu/1g of root) |
|---------------------|------------------|-----------------|------------------------|---------------|--------|-------|---|
| | | | | | kg/10a | Index | |
| conventional | 128 | 3 | 42 | 8 | 51.7 | 100 | 0 |
| E681 | 149 | 6 | 137 | 5 | 59.5 | 115 | 9.0×10^1 |
| benomyl+pellet | 133 | 5 | 101 | 7 | 66.2 | 128 | 0 |
| E681+pellet | 160 | 5 | 120 | 6 | 71.9 | 139 | 3.5×10^1 |
| benomyl+E681+pellet | 137 | 3 | 94 | 5 | 63.6 | 123 | 1.6×10^2 |

Seed soaked in acetone solution for 5 seconds and dry immediate after. Then soaked in E681 bacterial suspension.

Pelletized seed by mixture of clay(1) : talcum(4) : perlite(1).

Polyvinyl alcohol 1~2% were used as sticker to make seed pellet.