

## SEED PRODUCTION IN PASTURE AND FORAGE CROPS

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The impact of any breeding program on agriculture is fully realized only when farmers decide to replace an old variety with a new one. This is possible only if the breeder is able to maintain the genetic integrity of a new variety and if the seed is produced and distributed in commercial scale.

The maintenance of genetic integrity of a new variety is important because it is the base of certification procedure, and certification is important because it is the only guarantee of the name and genetic qualities of a new variety.

The process by which the small amount of breeder's seed is multiplied into tons of certified seeds, requires the solution of both genetic and agronomic problems, which are different in species having different utilization, and system matings e.g. vegetatively propagated species self-pollinated species and cross-pollinated species.

It is also important to mention that forage crops are bred and grown for high dry matter in contrast with other crops (cereals, legumes) in which seed production is important.

Pastures Forages, and Livestock Improvement Program at ICARDA is concerned mainly with annual forages which are annually resown crops i.e., forage vetches "Vicia spp" and forage peas "Pisum sativum, and pastures which are self-regenerating communities used mainly for grazing, such as annual medics, **Medicago** spp. Therefore, I will focus on the process of seed production of these crops, and the constrain of producing certified seeds in the ICARDA region.

With respect to annual forages (vetches and peas) the maintenance of genetic integrity of these species must rely upon a careful maintenance selection.

The agronomic practices for seed production in annual forages, often differ greatly when the crop is used for forage production. For example, Low planting rate has been shown to increase seed production over dense planting.

Most of forage vetch varieties are characterized by podshatterings at maturity causing a great loss of seed, therefore breeders should look for non-shattering varieties to avoid of seed.

Harvesting also is one of the most critical steps in forages and seed production, delayed or early harvest causes some problems, as shattering and reducing the viability. Seed losses due to shattering may be prevented by selection for high seed retention capacity.

Weed control also is essential for the growth of strong healthy plants. In a seed crop establishment weeds not only compete with the sown for moisture, nutrients and light but because of the presence of weeds. Thus efficient weed control with the selection of fields relatively free of weeds is necessary to produce good seeds.

### **Annual Medics :**

At present there is no production of medic seed in the R Région. If the annual pasture system is to be adopted it is most important that development of seed industries commence in the near future. The technology is new to the Region and differs greatly from that used to produce cereal, food legume or even forage legume seed.

The important difference is that in selecting medics the breeder selects for self-regeneration, which means that the criteria important for seed production — non shattering seeds and pods, non dormant seeds — are selected against. For example it is important that medic pods fall to the ground, preferably beneath the surface if they are to self regenerate. This presents special problems for the seed producer.

In order to overcome these problems a special seed harvester has been developed. This machine acts like a giant vacuum cleaner and suks the seed from the surface of the soil. For the machine to work the soil surface must be leveled plant residues must be removed, and the soil surface loosened. The machine will also harvest a large amount of fine and coarse soil particles, which must be removed from the seed. The machine is produced in Australia by Horwood — Baqshaw and is called a cleaver harvester.

Most medic seeds, when harvested are dormant, and must be scarified (the seed coat is impermeable to water and must be physically damaged before the seed will germinate). This often takes place during the threshing process, but to make sure that it has germination tests need to be carried out during the certification process.

The problems of producing medic seed — the maintenance of genetic purity, freedom from weeds and diseases — are similar to those of other crops.

## Résumé de l'exposé de Monsieur Ali Abdelmoneim de l'ICARDA

Le programme de l'ICARDA sur les fourrages, les prairies et l'élevage est concerné essentiellement par des fourrages annuels qui sont semés annuellement (Pois et vesces) et des espèces prairiales autorégénératrices telles que les espèces annuelles du genre *Medicago*.

En ce qui concerne les vesces et les pois fourragers, le maintien de l'intégrité génétique doit reposer sur la sélection conservatrice. Les techniques culturales pour la production de semences diffèrent très sensiblement de celles utilisées pour la production de matière verte. Par exemple, une faible dose de semis s'est révélée plus adéquate qu'une dose élevée.

La plupart des variétés de vesce sont caractérisées par la déhiscence des gousses à la maturité, entraînant de grosses pertes de semences. Aussi les améliorateurs devront rechercher des variétés non déhissentes. La récolte est aussi une des étapes les plus critiques dans la production des semences fourragères. Une récolte précoce ou tardive causent certains problèmes, comme la déhiscence et la perte de viabilité. Le contrôle des mauvaises herbes est essentiel pour la croissance de plantes saines et vigoureuses.

Pour ce qui est des espèces annuelles du genre *Medicago*, il n'y a actuellement aucune production de semence dans la région d'Afrique du Nord et du Proche-Orient. Si le système des prairies annuelles est adapté dans la région, il est très important que l'industrie des semences commence dans le proche avenir. La technologie est nouvelle pour la région et diffère beaucoup de celles utilisées pour les céréales et les légumineuses alimentaires et fourrages classiques. La différence importante est que dans la sélection du *Medicago*, l'autorégénération est le critère le plus décisif, ce qui veut dire que les critères importants pour la production de semences en général

— non déhiscence et non dormance — ne sont pas recherchés pour le *Medicago*.

Une récolteuse spéciale a été développée pour le *Medicago*. Elle est produite en Australie par la société Harwood-Baqshaw. Elle agit comme un aspirateur géant qui aspire les gousses de la surface du sol. Pour que cette machine travaille, il faut que le sol soit bien nivelé et les résidus enlevés.