9. POTENTIAL FODDER CROPS FOR NORTH VIETNAM

9.1. Oats

Oats is an important winter cereal fodder grown widely for forage production. It can be cut and fed to animals or can be grazed; it can also be preserved in the form of hay or silage. Oats grown in mixture with berseem give an early cut as well as providing protection to the young berseem seedlings during cold temperatures. It gives higher fodder yields than other winter cereals such as wheat and barley. Similarly, it is more palatable than wheat and barley because of the high number of leaves and soft stems.

Type of grass:

Winter annual

Growing period:

October-April

Varieties/cultivars:

1 Early to medium: PD2 LV65, Swan, Avon
2. Late: S-81, Cuscade, Scott, Tibour

Soil:

All types of soil but prefers clay and loamy soils.

Land preparation:

Prepare fine seed bed by 2-3 ploughings and smoothing/levelling with planking or appropriate implement.

Sowing time:

September-October

For early fodder production both in the plain areas and mountainous areas best planting time is 20th September- October. Fodder will be available in November-December. However, late planting can continue till December but fodder production will start in March.

Sowing method:

Line sowing 30 cm apart is preferred or broad cast.

Fertilizer:

15-20 tons/ha farmyard manure before land preparation. One bag of 50 kgs,DAP + one bag urea at sowing and half bag urea/ha. after every cutting.

Irrigation:

First irrigation 20 days after sowing and subsequent irrigations depend on temperature and weather.

Diseases:

Mainly aphids and leaf hoppers (jassids) attack the crop. In case of heavy infestation on seed crop, use an appropriate chemical spray.

Cutting stage:

Cutting stage mainly determines the ultimate fodder yields and its quality. With the increase in age, maturity, or cutting stage, nutritive value and palatability of the harvested fodder decreases. To obtain the best compromise between fodder yield and quality, the crop should be harvested at late vegetative stage. At this stage regeneration, palatability, and quality is higher than at 50 % or 100 % heading and also 1-2 extra cuttings and hence more fodder can be obtained.

Cutting height:

The crop should always be harvested at least 4 inches from the ground level to facilitate quick regrowth.

Oats + brassica + berseem mixture:

For prolonged fodder supply and in order to improve yield and quality, the oats should be mix-planted with a mixture of berseem + brassica. Plant 50-62 kg of oats seed per hectare by cultivation and broadcast 20 kg berseem + 0.25 kg brassica seed per hectare in standing water.

Quality:

At the vegetative stage oat fodder contains 14 % crude protein while at 50 % heading only 6 % crude protein is present in the fodder.

Yield:

The yield of the crop mainly depends on time of planting, soil fertility, management etc. However, 80-100 tons green fodder per hectare is easily obtained.

Seed production:

The seed crop should not be harvested after mid March. The crop matures in the first week of May. A good crop produces 2 - 2.5 tons of seed /ha.

9.2. Vetch

Type of legume:

Annual winter legume

Growing period:

October-May

Varieties:

Most varieties belong to *Vicia sativa* and *Vicia dasycarpa*.

Soil:

Medium textured soils with sufficient calcium produce high yields.

Land preparation:

1-2 ploughings will be sufficient for a good crop.

Time of sowing:

September- October

The best time to produce early fodder both for plain and mountain areas is October-November but can be planted till December. The forage availability will be late and also the yields will be low in late planted crop.

Seed rate:

50 kg per hectare.

Sowing method:

Row planting 30 cm apart is preferred or broadcast.

Fertilizer:

Four bags of superphosphate or two bags of DAP per hectare at sowing.

Irrigation:

A total of 2-3 irrigations at an interval of 4-5 weeks is sufficient to obtain an excellent forage crop.

Cutting stage:

Early varieties should be harvested at a full bloom stage while medium and late varieties provide higher yields and better quality before flowering.

Yields:

50-60 tons fodder per hectare.

Vetch + oats mixture:

For maximum yields vetch should always be intercropped with oats. Use full seed rate of oats + 30 kg per hectare of vetch seed.

Seed production:

The October - November planted crop produces 2-3 tons of seed per hectare.

9.3. Rye Grass

Type of grass:

Annual / Perennial

Growing period:

October-March

Varieties:

Italian and Wara

Soil:

It tolerates salinity fairly well. It can be cultivated on all types of soils but thrives well on irrigated clay and clay loam soils.

Land preparation:

Prepare fine seed bed by 2-3 ploughings.

Time of sowing:

September-October.

The best planting time is early Autumn i.e. in September/October. For better yields and quality it should always be mix-planted with lucerne or red clover.

Seed Rate:

50 kg per hectare.

Sowing method:

Line sowing at 30 cm apart is preferred but can be planted by broadcast method.

Fertilizer:

Two bags DAP per hectare at sowing and two bags urea per hectare after germination. Add one bag urea per hectare after every cut.

Diseases:

Aphids sometimes attack the crop but are not a serious problem.

Cutting stage:

Always start harvesting at head initiation and complete harvesting before or at 50 % heading.

Cutting height:

Harvest (8 cm) above the ground level. This will protect new shoots and enhance re-growth.

Yield:

50 tons per hectare.

Rye grass /lucerne/red clover mixture:

For higher yields and quality, rye grass must be inter-cropped with other perennial crops like lucerne or red clover.

Quality:

Its forage or hay contains 13 % crude protein.

Seed production:

Do not harvest the crop for forage and leave in late spring for seed production in cool areas and early spring in hot areas. 1000-1500 kgs seed yield per hectare can be obtained.

9.4. Sorghum Sudan Grass Hybrid

Type of grass:

Annual, multicut hybrid, (for every S. S. hybrid, parents are different male sterile "A" lines of sorghum as a female and different cultivars of sudan grass as male parent).

Growing period:

March-October

Varieties:

Sandoz, Pioneer, Lever brothers, Cargil, ICI, etc.

Soil:

Grows well on all kinds of soils except alkaline and water-logged. Heavy sandy soils with sufficient organic matter are very suitable.

Land preparation:

2-3 ploughings followed by planking to level the land and break clods, if any.

Time of sowing:

In all agro-ecological zones during spring i.e. March-April or April-May. Minimum temperature for its growth is 10^0 C. It takes 4-5 days to germinate at 20^0 C. The growth is very vigorous at around 30^0 C.

Seed rate:

24-30 kg per hectare.

Sowing method:

Line sowing 30 cm apart or broadcast.

Fertilizer:

Two bags DAP + two bags potash per hectare at sowing. Also two bags urea per hectare after every cutting.

Irrigation:

First irrigation 21 days after sowing. Subsequent irrigations according to weather conditions.

Diseases:

Shoot fly and stem borer. Best prevention is to apply 3% Furadon granules 8 kg per acre at sowing or with first irrigation.

Cutting stage:

Is a multicut crop, therefore for higher yields, better quality, quick and sufficient regrowth, always start cutting at the boot stage and complete harvesting at or before 50 % heading.

Cutting height:

Harvest 8 cms. above the ground level for quick and vigorous regrowth.

Yield:

100-120 tons per hectare.

S. S. Hybrid + cowpea mixture:

Always intercrop some legumes like cowpea with S.S. Hybrid to improve yield and quality. Use full seed rate of S. S. Hybrid + 25 kg seed per hectare of cowpea.

Quality:

Provides good quality fodder and silage. Its fodder contains 10% crude protein if harvested before heading.

9.5. Sorghum

Type of grass:

Summer annual

Growing period:

March-October

Varieties:

1119, BR-319, forage sorghum etc.

Soil:

Sandy to sandy loam soils but prefers clay and loam soils.

Land preparation:

Prepare fine seed bed by 2-3 ploughings.

Time of sowing:

In all agro-ecological zones start planting during spring till summer i.e. March-April and May-June. The minimum temperature for its germination is also 10^0 C. The germination is very quick at and above 20^0 C.

Seed rate:

60-70 kg per hectare.

Sowing method:

Line sowing 30 cm apart is preferred or broadcast.

Fertilizer:

3 bags of Nitrophos + 1 bag of urea/ha after germination with second or third irrigation.

Irrigation:

Sorghum is called the “camel of crops”. It is a very drought resistant and heat resistant crop. It flourishes well during the very hot season. First irrigation 21 days after sowing. Subsequent irrigations depend on weather.

Diseases:

Red leaf spot is common during humid conditions. Shoot fly and stem borer are the most common pests. Apply 20 kg per hectare of Furadon granules at sowing or with first irrigation.

Cutting stage:

At least two cuttings can be obtained if the crop is harvested before heading. Also for maximum nutritive value of fodder and acceptable yields the crop must be harvested at boot stage.

Cutting height:

If a second cutting is required, harvest the crop 8 cms above the ground.

Yield:

50-55 tons per hectare.

Quality:

Contains 10 % crude protein if harvested at boot.

Sorghum + cowpea mixture:

For better yield and quality always inter-crop cowpea or another legume with sorghum. Use full seed rate of sorghum + 37 kg cowpea seed per hectare.

Seed production:

Usually the June - July planted crop is kept for seed. The seed matures in September - October. 3-4 tons of grain yield/hectare can be obtained from a good crop.

9.6. Hay Making

Hay is dried plant material. It is usually consumed during fodder deficit periods and in most areas is the main feed of livestock during winter. The quality of hay used is often very poor and great improvements can be made. A variety of crops can be converted into hay; however, the best quality hay is prepared from oats, berseem and lucerne. The quality of summer and winter cereals can be improved by intercropping them with legumes.

Stage of cutting:

Appropriate stage for haymaking is the bloom or heading stage. In case of summer cereals 50 percent of flowering is the most appropriate stage for harvesting of the crop. While in the case of winter cereal the dough stage is the best for harvesting. In the case of legumes (both summer and winter) one tenth of blooming stage is recommended for harvesting.

Harvesting:

Harvest the crops and lay in thin layers in the field for a period of time to become dry. This interval depends on season, type of crop and stage of maturity of the crops. The crop should be turned on the second day for drying. Care should be taken in turning the crop to avoid loss of leaves. Test the amount of moisture by pressing thoroughly in the fist (palm) or fingers. Through drying about 70 to 90 percent of the water present in the standing crop at harvesting is reduced to 18 to 20 percent by sun and wind without adversely affecting the nutritive value. Bacteria and fungi cannot grow in plant material at very low moisture percentage and if properly stored it can be kept for a long period with little loss in nutritive value.

Do not overdry because it causes hay shattering. For crops harvested at dough stage allow more time for grain drying.

Storing or stacking:

Remove the crop from the field when adequately dry, make bundles and store near farmstead in a clean and dry place. Care should be taken in storing the hay. If the crop is still wet it will result in heat burn and fungal growth. Never keep cured hay in open unprotected places. Store it either in a shed or cover with plastic/polythene sheet.

Feeding:

Hay can be fed during any season but generally it is fed during fodder scarcity periods when green fodder in not available. From 10 to 15 kg of good quality hay will meet most of the nutritional requirements of a 400-kg animal. However, additional nutrients are required for production.

9.7. Urea Straw Treatment

There is acute fodder shortage in the winter season from December to February in most of the areas of north Vietnam. Farmers feed their animals dry stalks of maize, grass, and rice straw. These are of low quality and their protein contents are not sufficient to fulfil maintenance requirements of the animals. Treating straw of rice with urea can result in the following benefits.

1. The treated straw is more digestible than untreated straw.
2. The nutritional quality of the straw improves.
3. The treated straw is not affected with fungus or insects.

Treatment Method:

Treatment procedure for rice straw is same as for wheat. Four kg of fertilizer urea is required for 100 kg chopped straw of wheat or rice. Spread 10-12 cm deep layer of the chopped straw on clean and comparatively high ground. Dissolve 4 kg of urea in 40 to 50 litres of water. Sprinkle the solution on the first layer and start with the second layer. The person sprinkling the solution should press the straw with his feet. Complete the whole process and shape the stack for covering. Cover the stack with empty plastic or gunny bags or polythene sheet. If these are not available unchopped straw or grasses or mud plastering can also be used. Close the stack on all sides to avoid entry of air or escape of gas from inside the stack. The treatment completes within 3 to 5 weeks depending upon the weather conditions.

Feeding of the straw:

Only open the stack on one side and remove the required material needed for feeding the animals. It will have a strong smell of ammonia, therefore, mix the straw with some fodder to obtain better results. Within 2 to 3 days the animals get used to the smell. Straw needs to be chopped before the treatment process.