

Major agriculture activities

in the month of June

Seema Sepat¹ and Dinesh Kumar²

Division of Agronomy, ICAR-Indian Agricultural Research Institute, New Delhi 110012

June is the beginning of major agricultural activities. Monsoon becomes active in the country at the end of the month. Accordingly, farmers can plan the sowing of cereals, pulses, oilseed, vegetables and fodder crops in this month. Proper care of the already planted rice seedlings needs to be continued. If not then sowing of rice should be finished in the first fortnight of June in the nursery area to obtain higher rice seed yield. At the end of this month, some farmers started on rice transplantation. Proper care of crops grown is also an important agricultural work in this month. Therefore, important agricultural activities that need to carry out in this month have been discussed in the paper.

Key words: Green manuring, Groundnut, June, Monsoon, Pigeonpea, Rice, Sesame, Soybean

Rice

The sowing of rice crop must be completed up to the mid of June to obtain healthy rice seedlings for transplanting. The following varieties of rice can be cultivated for higher production.

Early maturing varieties (110-115): PNR-381, PNR-162, Narendra Dhan-86, Govind, Saket-4, Narendra Dhan-97, Sahbhagi Dhan, Sampda (Yield potential-4.5-6t/ha)

Medium duration varieties (120-125): Sarju-52, Pant Dhan-10, Pant Dhan-12, IR-64, Gotara Bhidhan-1, Khandhgiri, Mahamaya and Naveen (Yield potential-5.5-6.5t/ha)

Long duration varieties (130-140): Pusa-44, PR 106, Malwiya-36, Narendra-359, Mahsuri, Lalat, Narndra 8002, Puja, Pratiksha, Rani Dhan, Ranjit, Samba Mahsuri and Swarna Sub-1 (Yield potential-6.0-7.0 t/ha)

Hybrids: Pant Sankar Dhan-1, KRH 2, PSD 3, GK 5003, PA 6444, PA 6201, PA 6219, DRRH 3, Indria Sona, Suruchi, Narendra Shankar Dhan 2, Pro Agro 6201, PHB 71, HRI-120, RH 204 and PRH-10.

In nursery, seed should be soaked

in water and thereafter water level needs to be increased at 3-4 cm. If possible irrigate the rice nursery in the evening only. In the nursery, infestation of weed can weaken the rice seedling. Therefore, remove all the weeds through hands frequently. If hand weeding is not possible then

use herbicides accordingly. Take 50 kg sand and mix the Butachlor at 1.5 kg a.i./ha which can be broadcasted in the rice nursery area for effective weed management. This formulation should be applied within 3-4 days after sowing and the water level should be kept below 1-2 cm in the



Fig. 1. Traditional practice of puddling

rice nursery area. However, precautions need to be taken while using herbicides.

Use Chlorpyrifos at 0.5 kg a.i./ha in case of insect infestation in rice nursery area. Broadcasting of urea @ 6-10 kg per 1,000 m² area can be done when the rice seedlings are 10-15 days old. A spray of 0.5% zinc sulphate + 0.25% slacked lime depending on the severity and occurrence of zinc deficiency in the nursery. If the upper leaves of the rice seedling turn white and thereafter withered than these are the peculiar symptoms of iron deficiency. In this case, 2-3 spray of 1% ferrous sulphate + 0.5% slacked lime should be done and repeated after one-week interval. It has been observed that keeping the standing water in rice nursery area also alleviates the iron deficiency symptoms.

System of rice intensification (SRI)

The system of rice intensification is also known as SRI. In this method, age of the rice seedlings for transplanting is 8-10 days and maximum is up to 14 days. Land preparation is done through traditional methods. After the ploughing of the field, pounding of water is done followed by 2-3 times puddling by the use of puddler (Fig. 1). The main objective of puddling is to incorporate the weeds and reduce the water infiltration into the soil.

In SRI, transplanting of rice seedling is done at a spacing of 25 × 25 cm. One seedling is planted per hill. Thereafter, no standing water is allowed throughout the growing season. However, soil water is maintained at the saturation point. Light irrigation is done to facilitate proper root aeration which promotes soil bacteria and root growth. In general, hand weeding through star weeder and power weeder is done. Manual or mechanical hand weeding improves the soil aeration and therefore the root growth which is critical for SRI. Hand weeding also incorporates FYM and bio-compost which enhances beneficial soil micro-organisms. In SRI, compost, FYM, green manures are preferred for optimum nutrient management. If there is a shortage of bio-fertilizers



Fig. 2. Manual transplanting of rice

then chemical fertilizers in combination with organic manures can be used. SRI method uses 30-40% less water compared to traditional puddled transplanted rice.

Direct-seeded rice

The direct-seeded rice (DSR) is the improved method of rice cultivation for the water shortage regions. Several findings have reported that DSR has higher water productivity compared to puddled transplanted rice. In DSR, high yielding varieties or hybrids are chosen and sowing is done under unpuddled conditions. DSR sowing can be done through handmade country plough or seed drill. DSR is sown like wheat crop and irrigation in general done according to the water requirement of rice crop. A seed rate of 25-30 kg/ha is required and sown at a spacing of 25 cm. Pre-sowing irrigation is required to obtain optimum soil moisture to ensure good germination. The optimum time of DSR sowing is the end of June. A dose of 150, 50, 40 kg/ha NPK, respectively, is recommended for optimum nutrient management in DSR. A 1/3 of N and all quantity of P and K can be applied at the time of sowing for higher growth of rice seedlings. The remaining N in equal half proportion can be applied during tillering and

flowering stage, respectively.

In DSR, water ponding is not allowed thus iron deficiency symptoms can appear at any crop growth stage. If the soils are deficient in iron than 2-3 sprays of 2 % iron sulphate should be done during the tillering stage at 15 days interval. A high weed infestation is a major problem in the successful cultivation of DSR. A spray of pendimethalin at 1 kg a.i./ha within 2-3 days after sowing (pre-emergence) can control the initial flush of the weeds. Spray of 2,4-D at 0.5 kg a.i./ha at 20 days after sowing (post-emergence) can control the broad-leaved weeds in DSR. In DSR, nematode infestation is another major problem. Broadcasting of carbofuran 3 G at 25-30 kg/ha can be done to control the nematode infestation.

Transplanted puddled rice

Irrigate the rice nursery a day before transplantation so the pulling of rice seedlings will be easier. Washing of roots of rice seedlings should be done with utmost cares and always hold the neck of seedling in between the fingers to avoid root injury. Transplanting should be done at a spacing of 20 × 10 cm (Fig. 2). Transplant 2-3 rice seedling per hill to ensure 50 rice seedlings per meter square area.

Use of FYM, compost and green

manure is advisable in rice crop to maintain crop productivity and soil health. In rice, nitrogen requirement can be supplied with the growth of green manuring crops such as *dhaincha* and sunhemp. Green manure crops can fix 50-60 kg N/ha. Nutrient management in rice should be done based on the soil test values. A dose of 120, 60 and 40 kg/ha of NP and K, respectively is recommended for high yielding varieties. Likewise, dose of 100-120, 50-60 and 40-50 kg/ha of NP and K, respectively is recommended for basmati varieties. A dose of 130-140, 60-70 and 50-60 kg NP and K, respectively is recommended for hybrids. Application of 20-25 kg/ha zinc sulphate on the occurrence of zinc deficiency in the soil. Apply 1/3 amount of urea within 5-8 days of transplanting so plants root can grow vigorously. The remaining dose of urea should be applied in equal amount at tillering (25-30 days after transplanting) and flowering stage (50-60 days after transplanting) of rice plant. The whole amount of phosphorus should be applied at the time of transplanting through single super phosphate or di-ammonium phosphate. Likewise, potassium should be applied at the time of transplanting through muriate of potash. The whole amount of zinc sulphate should be applied in the soil at the time of transplanting. If zinc is not applied in soil, then 3 sprays of 0.50% zinc sulphate along with slaked lime (0.25%) can be done at 15-20 days' interval. The first spray should be done after one month of the transplanting. The use of neem coated urea is found beneficial to enhance crop productivity and nitrogen-use efficiency in rice.

Green manuring

The incorporation of green manure crops at flowering stage has been found beneficial for soil health (Fig. 3). In general, flowering occurs at 8 weeks after sowing in most of the green manure crops. In *dhaincha*, maximum vegetative growth occurs at 8 weeks after sowing. However, in case of sunhemp, 60-70 days are found optimum for the soil incorporation. Ploughing can be



Fig. 3. Incorporation of green manure crops

done to incorporate standing green manure crop. Thereafter, cultivator is used to ensure proper green manure incorporation. The optimum soil moisture needs to be ensured at the time of incorporation of green manure crops. Deep ploughing is always beneficial as compared to shallow ploughing for proper decomposition of green manure crops. The next *kharif* crop can be taken after the incorporation of green manure crops without any harmful effects.

Soybean

A medium to heavy loam soil is desirable for the cultivation of soybean crop. There is a need to ensure that soil should be free from water logging as the crop is very susceptible. Soil should be free from salts. A deep ploughing after two harrowing followed by planking is desirable for optimum bed preparation. Sowing of soybean should be done during the end of June to the first week of July. Sowing of soybean mainly depends on the regions. In north hill zone-June; north plain zone-mid June to mid July; central India-mid June to mid July; south India-mid June to end July; north-east India-mid June to mid July is the optimum time for the sowing of soybean crop to obtain higher productivity. A good vigour of

seed is required for proper germination. The seed rate of soybean depends on the size of seeds. Small size seed 60-65 kg/ha; medium size seed 70-75 kg/ha and bold size seed 80-85 kg/ha are recommended. The seeds should be treated with 2 g thiram+1 g carbendazim 50 WP/kg of seed before the sowing. Thereafter, treat the seed with rhizobium or PSB culture. Ensure the sowing of soybean crop in lines. A spacing of 45 cm×10 cm should be maintained. The depth of sowing should be at 3-4 cm as the deep placement of seed delays the germination and plant growth. Well decomposed FYM @ 5-10 t/ha should be incorporated at 20-25 days before sowing in the soil. A dose of 20-25 kg, 60-80 kg and 40-50 kg/ha of NPK is recommended for higher production. Application of sulphur at 20-25 kg/ha is recommended for higher oil recovery. Spray of pendimethalin or metachlor at 1 kg a.i./ha in 750-800 litre water is recommended for effective weed control. The improved varieties of soybean are mentioned in Table 1.

Groundnut

The second fortnight of June is optimum for the sowing of *kharif* groundnut. However, in rainfed regions, after the rainfall or first fortnight of July are optimum duration for groundnut sowing. In

Table 1. Recommended varieties of soybean for various regions in India

Variety	Region	Duration (days)	Characteristic
Pooja (MAUS 2)	Karnataka Southern zone	100-105	Resistant to bacterial pustule and leaf spots. Moderately resistant to leaf miner, stem fly and blue beetle.
DSb-21	Karnataka Southern Zone	90-95	Resistant to rust
MAUS 162	Maharashtra	100-103	Tolerant against charcoal rot, <i>Rhizoctonia</i> root rot and <i>Rhizoctonia</i> aerial blight
KDS 344 (Phule Agrani)	Southern Zone	94	Tolerant to rust; moderately resistant to stem fly, pod borer and leaf roller
NRC 86	Central zone	95-97	Moderately resistant to bacterial pustule, pod blight and collar rot; highly resistant to charcoal rot; highly resistant for girdle beetle; moderately resistant to stem fly
Pusa 12 (DS 12-13)	North Plain Zone	124-131	Resistant to YMV, <i>Rhizoctonia</i> aerial blight and bacterial pustules

case of bunch varieties, 100-125 kg/ha seed can be recommended while 80-100 kg/ha is used with spreading varieties. The seed treatment should be done with 2 or 3 g thiram or carbendazim per kg of seeds. Thereafter, seed should be treated with rhizobium culture. For this, a $\frac{1}{2}$ litre of water is needed to boil till the added 50 g of jaggery properly dissolves. The whole mixture needs to be cooled and mix 200-250 g of rhizobium culture. A 10 kg seed can be treated with the prepared mixture. The sowing should be done immediately after the seed treatment. A spacing of 30 cm $\times$ 10 cm can be maintained in bunch varieties. In case of spreading varieties, 45-60 cm $\times$ 10-15 cm row to plant spacing needs to be maintained for higher productivity. Seed drill can be used for groundnut sowing to ensure proper row and plant spacing. The depth of sowing should be maintained at 4-6 cm to ensure proper germination.

For nutrient management, FYM @ 5-10 t/ha can be used if the soil test values are not available. A dose of 20-30 kg, 40-60 and 30-40 kg/ha of NPK, respectively can be used for optimum nutrient management. Application of 200-400 kg/ha of gypsum is recommended to meet out the gypsum and calcium requirement in groundnut crop. The whole amount of NPK and half amount of gypsum should be incorporated at the time of sowing in the soil. A dose of 15-20 kg, 30-40 kg and 20-25 kg NPK, respectively is recommended for rainfed regions. Zinc sulphate at 25 kg/ha is recommended to meet out the zinc requirement in zinc deficient soils.

Groundnut crop should be kept weed free up to 25-45 days after sowing. Therefore, first hand weeding at 20-25 days after sowing and second at 40-45 days after sowing is recommended. If there is labour shortage than spray of alachlor at 1.5-2.0 kg a.i./ha in 700-800 litre water is recommended. In north India, Punjab moongphali 1, SG 55, SG 84, ICGS 37, ICGS 1, Mukta, Prakash, Chitra, VU 13, SNG 10, MH 4, M 335, DRG 17, CSMG 84-1 (Ambar), MA 16, M 552 varieties of groundnut is recommended.

Pigeonpea

The first week of June is optimum for the sowing of pigeonpea under assured irrigation conditions. In north-west India like Punjab, Haryana, Rajasthan, Delhi and Uttar Pradesh, pre-sowing irrigation should be applied and early maturing varieties of pigeonpea can be sown during the second week of June. In north-eastern India such as Bihar, West Bengal and eastern Uttar Pradesh, sowing can be done with the onset of rainfall which usually starts at the end of June. Seed treatment with fungicides and insecticides should be done before the sowing. Bavistin at 2 g/kg seed can be used for fungicide treatment. Thereafter seed treatment with rhizobium should be done. A spacing of 40-60 cm $\times$ 10-15 cm is recommended for short duration pigeonpea crop. For long duration varieties, 60-120 cm $\times$ 15-20 cm row to row and plant to plant spacing is recommended. Seed size and architecture of the plant decides the seed rate. A seed rate of 15-20 kg/ha is recommended.

If nitrogen is deficient in loamy or sandy soils than application of 20-30 kg N/ha is recommended. A dose of 80-100 kg and 40-60 kg/ha of P and K, respectively can be applied at the time of sowing. A dose of 20 kg, 60 kg and 40 kg/ha NPK, respectively is recommended for early maturing varieties. Hand weeding through hand hoeing can be done up to 30-40 days. Application of alachlor (2 kg/ha) or pendimethalin (1 kg/ha) in 600 litres of water can be done within 3 days of sowing for effective weed management. If crop is sown in the first week of June than apply two light irrigations to ensure proper growth. If rainfall gets delay than first irrigation at the pre-flowering stage and second at pod formation should be ensured. In north-western India (Uttar Pradesh, Haryana, Punjab and Rajasthan), PDH 4, Pusa 992, Pusa 991, Pusa 2001 and Pusa 2001, north-eastern India (Eastern Uttar Pradesh, Bihar, West Bengal and Assam), Azad, Virsa arahar-1, Narendra Arhar 1, B 7, MAL 13 varieties of pigeonpea are recommended for higher productivity.

Sesame

The last week of June and the first week of July is the optimum time for sowing of sesame. The selection of varieties and seed quality are the major factor for higher sesame production. Seed treatment through thiram, captan or bavistin at 3 g/kg seed can be done before sowing. In general, sesame sowing is done through broadcasting which requires higher seed rate. Sowing of sesame through broadcasting hampers proper weed management. Line

sowing is recommended for optimum plant population and better weed management. Line spacing of 30-45 cm is recommended to obtain proper plant population. Thinning can be done at 15-20 days after sowing to obtain plant spacing of 10-15 cm. The depth of sowing should be kept at 1.5-2.5 cm. A dose of 40-50 kg, 20-30 kg, 20 kg of NPK is recommended for irrigated regions. However, in case of rainfed regions, a dose of 20-25 kg, 15-20 kg NP, respectively is recommended. Half amount of nitrogen and the whole amount of PK should be applied at the time of sowing. The remaining half amount of nitrogen can be applied at 30-35 days after sowing. In rainfed regions, whole amount of NPK should be applied at the time of sowing.

Cotton

Cotton is a *khariif* crop which requires 6-8 months to mature. Its time of sowing and harvesting differs in different parts of the country

depending upon the climatic conditions. In Punjab and Haryana, it is sown in April-May and harvested in December-January, before the winter frost can damage the crop. In the peninsular part of India, it is sown up to October and harvested between January and May because there is no danger of winter frost in these areas. In Tamil Nadu, it is grown both as *khariif* and as *rabi* crop. The crop is generally grown in medium to deep black clayey soil but is also grown in sandy and sandy loam soil through supplemental irrigation. Cotton is best grown in soils with excellent water holding capacity. Aeration and good drainage are equally important as the crop cannot withstand excessive moisture and water-logging.

Suitable varieties for Punjab, Haryana, Rajasthan and Western U.P are – LH 900, LH 1556, F846, F 1378 G.27, LD 327, LD 491, RST 9, Ganganagar Ageti, RS 875 and RG 8 varieties of cotton can be taken. In Maharashtra, DHY 286,

Purnima, AKH 081, Rajat. AKH 4, AKH 5, AKA 8401, Y1 and PA 183 can be cultivated successfully. DB 3-12, MCU 7, LRA 5166, MCU 5 VT, SVPR 2 and Surabhi can be grown in Karnataka and Tamil Nadu. The recommended dose of N @ 150 kg/ha can be into three applications as 1/3rd quantity each at 30, 60 and 90-days after sowing. The entire recommended dose of P and K fertilizer (80 and 60 kg/ha, respectively) should be applied as a basal application. Spray of pendimethalin at 1 kg a.i./ha in 600 litres of water can be done for weed management. Cotton is generally prone to secondary nutrient deficiency particularly Mg. In case of visible deficiency symptoms, Mg and other micronutrients are applied as foliar sprays at appropriate growth stages.

¹S Scientist, Corresponding
seema@iari.res.in
²Principal author's
Scientist.
e mail:

Beat Plastic Pollution

If you can't reuse it, refuse it!



**BEAT
PLASTIC
POLLUTION**



**WORLD
ENVIRONMENT
DAY**



**INDIA
2018**

UN
environment