



KELPAK® LIQUID SEAWEED FERTILISERS

MODE OF ACTION AND RESPONSES

Kelpak is a liquid fertilizer made from the seaweed species *Ecklonia maxima*, (commonly known as kelp) and found in the cold waters of the South African West Coast. This species has a prolific growth rate, due mainly to the presence of nutritional elements and other natural growth stimulating compounds. The cell sap containing these substances is extracted from freshly harvested kelp with the unique proprietary Cellburst technology. No heat, freezing or harsh chemicals are used to break the cell walls in the extraction process. This ensures that the delicate compounds found in the kelp are maintained in their active form in Kelpak. The natural ratios of growth stimulating compounds in the fresh kelp are therefore maintained in the end product. Kelpak has been accredited by Australian Organic Limited (previously Biological Farmers of Australia), BCS Öko-Garantie GmbH and the Institute for Marketecology (IMO Switzerland) Regulations (EC) No. 834/07 and 889/08 for use in organic agriculture, and the Institute for Marketecology (IMO) Regulation USDA, AMS National Organic Program for use in organic production.

The auxin-like activity and phosphate dominated extract stimulates prolific adventitious root formation when Kelpak is applied to almost any plant. This drastic increase in root tips leads to an increased level of cytokinins in treated plants, as this group of hormones is mainly produced in root tips. The increased root volume and number of root tips also increase moisture and nutrient uptake from the soil. The improved nutrient status together with the higher level of cytokinin in the plant gives better top growth that causes the increase in yield and quality of crops. The improved root system also makes the plant more resistant to stresses such as drought, waterlogging, soil nutrient deficiency and salinity, nematode infestations and soil borne diseases.

Kelpak applied to plants in nurseries not only shortens the period in the nursery prior to plantout, but also produces plants with a stronger root system, showing enhanced transplant shock resistance. In tobacco nurseries Kelpak is applied 6 weeks and again 10 days before plantout by watering the plants with a 1:500 dilution in a watering can. Fruit trees, coffee, macadamia, tea, ornamentals and flowers, such as roses, and forestry plants in nurseries are treated by watering the plants with a 1:500 dilution of Kelpak at monthly intervals. When these plants are planted out into the field, a soil drench with a 1:200 dilution Kelpak is recommended to reduce transplant shock and to increase initial growth of the plants.

Leaf vegetables such as broccoli, cabbage and lettuce are treated with a 1:100 root dip before plantout and two foliar applications at 3 L/ha, with the first 14 days after plantout and the second 21 days later. This leads to consistent head weight increases of 10 to 20%. Melon, pepper and tomato seedlings are treated with a 1:100 root dip, followed by three 2 L/ha sprays 14 to 21 days apart. Such a treatment will not only increase yields, but will also increase the shelf life of the produce. Beans are treated with 2 L/ha at the third trifoliate stage and repeated two more times with 14 day intervals leading to consistent increases between 30 and 40%. Similarly, treatment of soya with 4 L/ha at the third trifoliate, followed by 2 L/ha 14 days later, will increase the yield between 20 and 30%.

Kelpak is used worldwide on soil crops such as potatoes and onions. Seed potatoes are dipped in a 1:500 dilution for 5 minutes prior to planting and this is followed by a 4 L/ha foliar spray 28 days after emergence, followed by a further spray at 2 L/ha 14 days later. Such Kelpak treatments consistently give yield increases of 15 to 30%. The roots of onion seedlings are dipped into a 1:100 dilution prior to plantout and this is followed by three 2 L/ha foliar sprays 14 to 21 days apart. This application gives consistent yield increases above 25%.

Field crops such as maize, grain sorghum and wheat are sprayed with 2 L/ha Kelpak at the 4 to 5-leaf stage, resulting in average yield increases of 12%. Similar results are obtained with barley, lupins and lucerne, with higher increases in yield.

The use of Kelpak was recently introduced on bearing macadamias in Malawi, where trees were sprayed four times with 2 L/ha. The Kelpak treatment gave a consistent increase in NIH yield, crack-out percentage and saleable kernel yield over three cultivars. The net increase in income averaged \$1 300 per ha over the three cultivars. Kelpak was also applied at 2 L/ha on tea to the first leaves of regrowth after pruning. The treatment increased picking weight with first and second round pickings by 25 and 30% respectively.

Kelpak can be applied as a foliar spray and enhances the uptake of nutrients when applied with foliar feeds as a tank mix. Kelpak should not be applied in a spray solution with a pH above 7, never be more dilute than 1:500 and should not be applied more frequently than 14 days apart.

Kelpak's efficiency as a cost effective agricultural fertiliser has been proven internationally in numerous research programs under differing climatic conditions and on a wide variety of crops. This natural product has a broad application base, is easy to apply and is compatible with most crop protection chemicals and foliar feeds. Its consistency in result and cost efficiency has led to its position as market leader in various countries worldwide.